

Transport for the North Scrutiny Committee Agenda

Date of Meeting	Thursday 15 April 2021
Time of Meeting	11.00 am
Venue	Virtual

Filming and broadcast of the meeting

Meetings of Transport for the North are 'webcast'. These meetings are filmed and broadcast live on the Internet. If you attend this meeting you should be aware that you might be filmed and included in that transmission.

Item No.	Agenda Item	Page
1.0	Welcome & Apologies	
2.0	Declarations of Interest Members are required to declare any personal, prejudicial or disclosable pecuniary interest they may have relating to items on the agenda and state the nature of such interest.	
3.0	Minutes of the Previous Meeting To consider the approval and signature of the minutes of the meeting held on 4 March 2021 as a correct record and to consider any requests for updates on matters contained therein.	3 - 10
4.0	Monthly Operating Report To consider the Monthly Operating Report of the Strategy & Programme Director.	11 - 36

5.0	Corporate Governance and Scrutiny Function Review To consider the report from Legal Team To review and recommend for approval the Annual Governance Statement	37 - 72
6.0	Decarbonisation Strategy To consider the report from the Principal Environmental & Sustainability Officer.	73 - 192
7.0	Exclusion of Press & Public To resolve that the public be excluded from the meeting during consideration of Item[s] [8] on the grounds that: (1) It is likely, in view of the nature of the business to be transacted or the nature of the proceedings, that if members of the public were present during such item(s), confidential information as defined in S100A(2) of the Local Government Act 1972 (as amended) would be disclosed to them in breach of the obligation of confidence; and/or (2) it / they involve(s) the likely disclosure of exempt information as set out in the Paragraphs [where necessary listed below] of Schedule 12A of the Local Government Act 1972 (as amended) and that the public interest in maintaining the exemption outweighs the public interest in disclosing the information	
8.0	Part 2 Minutes of the Previous Meeting To consider the approval and signature of the private minutes of the meeting held on 4 March 2021 as a correct record and to consider any requests for updates on matters contained therein.	193 - 196

Scrutiny Committee Minutes

Thursday 04 March 2021

Present:

Attendee

Cllr David O'Hara
 Cllr Laura Crane
 Cllr Andrew Cooper
 Cllr Neil Hughes
 Cllr Roger Jones
 Cllr Sean Chaytor
 Cllr Matthew Salter
 Cllr Patrick McKinley
 Cllr Mark Walsh
 Cllr John Davison
 Cllr Carl Johnson
 Cllr Steve Parish
 Cllr Kim Groves
 Cllr Stephen Fenton

Local Authority

Blackpool;
 Cheshire East;
 Cheshire West & Chester;
 Cumbria;
 Greater Manchester Combined
 Authority;
 Hull;
 Lancashire;
 Liverpool City Region;
 North East Combined Authority;
 North Lincolnshire;
 North of Tyne Combined Authority;
 Warrington;
 West Yorkshire Combined Authority;
 York;

Officers in Attendance:

Name

Gary Rich
 Dawn Madin
 Tim Foster

Jeremy Acklam

Rosemary Lyon

James Lyon

Peter Molyneux

Tim Wood

Peter Cole

Lucy Hudson

Salim Patel

Deborah Dimock

Job Title

Democratic Services Officer
 Director of Business Capabilities
 Interim Strategy & Programme
 Director
 IST Director
 Legal and Democratic Services Officer
 Legal Assistant
 Major Roads Director
 Northern Powerhouse Rail Director
 Principal Environmental &
 Sustainability Officer
 The Principal Policy Officer for freight
 and logistics
 Rail North Programme Manager
 Solicitor

Item Item**No:****1. Welcome & Apologies**

- 1.1 The Chair welcomed all in attendance and informed Members that the meeting is being streamed live. Apologies were received from Cllr Furneaux.

2. Declarations of Interest

- 2.1 There were no declarations of interest.

3. Minutes of the Previous Meeting

- 3.1 The minutes of the meeting held on 9 December 2020 were considered and their accuracy as a correct record confirmed. The minutes were proposed by Cllr Davison and seconded by Cllr Haslam.
- 3.2 A typographical error was highlighted in 5.7 and that the minute should read 'one freight train an hour' rather than 'what'.

Resolved:

That subject to the change noted in 3.2 the minutes of the meeting held on 9 December 2020 be approved as a true and accurate record.

4. 2021/22 Funding Update & Draft Business Planning

- 4.1 Members received the report from the Finance Director and the Interim Strategy and Programme Director. The Finance Director and the Interim Strategy & Programme Director shared a presentation with Members and provided background on the current situation. The Finance Director explained that normally he would be sharing a more detailed Business plan at this stage, but this has not been possible this year due to the late commencement of the process that was caused by the delayed receipt of TfN's funding allocation for 2021/22.

He noted the reduction in the Core funding allocation, but noted that an agreement has been reached with the Department to recharge some costs from core funding allocation into the NPR programme, therefore easing the core funding position. This, supported by releases from brought forward reserves, has allowed a core budget to be developed that supports Member aspirations. This had been tested through the Member Working Group established at the January Board to support business planning.

He highlighted the uncertainty that has been created for the NPR Programme by the delayed Integrated Rail Plan (IRP) and the re-phasing of the Strategic Outline Case delivery to TfN Board. It was noted that depending on its timing and substance, the release of the IRP might lead to the requirement for significant revisions to TfN's business plan and budget.

- 4.2 Cllr Hughes talked about the reserves and asked what the meaning of the reference to transition costs in the report.

The Finance Director explained that this referred to money that may be required if the organisation needed to restructure, which he believed would now not need to happen.

Cllr Hughes asked if this money could be returned to the reserves if not spent. The finance Director explained that if there is an underspend against the budget envelope then this money will be returned to the reserves. The Finance Director highlighted the fact that the Government had raised concerns about the level of reserves that were being held and this was part of the rationale for the cut in funding. He further explained that Members had approved the release of reserves to support proposed activity at the February board meeting.

- 4.3 Cllr Jones asked if there was a chance that the Government can be persuaded not to make a 40% cut.

The Finance Director explained that the Government has made clear that the position remains in accordance with the funding letter on 4 January and that the budget needs to be set within these parameters. He explained that it is likely that a Comprehensive Spending Review (CSR) submission will need to be developed and presented to Government later in the year.

- 4.4 Cllr Davison highlighted the fact that the report makes no mention of HS2 and promoting its construction and its importance to NPR as well as freight and the decarbonisation agenda.

In response the Finance Director explained that the focus of the report was principally in relation to the core funding. The Interim Strategy and Programme Director explained that when the Business plan is published those important connections to HS2 will be made.

- 4.5 Cllr Groves raised the issue of IST and what plans there are to work with partners on this programme going forward. Highlighting the Northern Transport Charter (NTC), she wanted to understand the range of measures that are in place to ensure that it is delivered. She requested that Government be challenged on why Blake Jones and the Williams Review have not yet been published.

On the issues of the NTC the Interim Strategy and Programme Director explained that TfN's policy development work on both the NTC and Strategic Transport Plan is being strengthened and clear monitoring and evaluation processes are being put in place.

He also explained that the Williams Review and the Integrated Rail Plan are expected imminently but no specific dates have been given, which is impacting on business planning.

- 4.6 Cllr Chaytor questioned whether revisions to Government funding are required. He highlighted the issue of electrification and suggested that this should go further following the announcement on Freeports and suggested that this should also be going out as far as the South Bank well. He suggested that this could be picked up within projects.

The Interim Strategy and Programme Director stated that the question on Freeports would be addressed during the Freight agenda item. He explained that the freeport element would be addressed as part of the Freight Strategy.

- 4.7 Cllr Hughes asked if there is any user group representation on the Rail North Committee and believes that Scrutiny should be pushing for this if there isn't.
- 4.8 Cllr Walsh expressed his frustration about the lack of funds for projects and the impact that downscaling will have across the region.

The NPR Director explained to Members that the full Leamside line reopening forms part of the TfN preferred network and the Government has been provided with statutory advice on this. On the issue of freight connectivity and electrification of the line between Hull and Leeds NR have allowed enough power to be available from the supply point to electrify to the Port, while this work does not form part of the NPR scope it could become part of a further package of work for such a short distance allowing Electric freight in and out.

Resolved:

- 1) That the report be noted
- 2) That the Scrutiny Committee's comments be noted on the priorities and emerging proposals for the operational teams and IST and NPR programmes set out in Section 4 and this report more broadly and that the comments be taken into consideration and fed into the TFN Board reports.

5. Manchester Recovery Task Force

- 5.1 Members received the report on the Manchester Recovery Task Force. The Rail North Programme Manager highlighted key areas of the report before taking questions and comments from Members.
- 5.2 Cllr Parish stated that this issue effects the whole of region and that he is also sceptical about the modelling. He explained that the current plans are not good for Warrington. He added that Warrington now has a new station with a franchise commitment for three trains an hour which was then reduced to two an hour and there had been room for the extra train but the modelling suggested that this couldn't happen as it would cause delays in Manchester which he believes to be incorrect.

He further highlighted that part of Manchester Airport's planning consent was granted on the condition that they increase public transport use and the proposals will come as a blow to that.

He expressed his belief that reducing services is marginal and it will not make a great deal of difference as there will still be delays because of delays elsewhere on the system. He also highlighted the issue of fewer trains leading to overcrowding on the platforms. He added that extra trains would be run during peak times which is when delays are most likely to occur.

Cllr Parish suggested that when there are trains running late then these should be kept off the Manchester corridor and that freight trains should stop being directed through Oxford Road at peak times.

The Rail North Programme Manager commented that the ideas were good and asked for these to be included in the consultation response. On the issue of modelling he stated that micro-simulation has been used which is far more advanced than previous models used and this is a model made specifically for the Manchester area. He also stated that this is an interim measure until infrastructure has been put in place.

- 5.3 Cllr Cooper highlighted the difficulties in making choices and that there are conflicting benefits in each authority as to which option is best.

The Rail North Programme Manager explained that everyone wants to maintain their services but this is not possible at the moment and that the decision needs to deliver the best option for the majority of passengers.

- 5.4 Cllr Chaytor suggested moving freight on to night services.

The Rail North Programme Manager explained that this is the subject of an ongoing conversation between Network Rail and the freight companies; however the freight companies have "grandfather rights" on

some of the routes and an alternative would need to be found. He hoped that there would be progress on this in the next couple of years.

- 5.5 Cllr Hughes asked what baseline is being used to calculate the proposals to relieve the congestion.

The Rail North Programme Manager answered that it is being assessed against December 2019 timetable.

Resolved:

- 1) That the report be noted;
- 2) That the recommendations made by the Scrutiny Committee Members be noted.

6. TfN's Freight Strategy - Update on Activity

- 6.1 Members received the report on the Freight Strategy from the Strategy and Programme Director. The Principal Policy Officer for freight and logistics then highlighted the key points in the report. She explained that the Freight Strategy will be a document that can be used to provide strategic advice to Government. She highlighted that much of the work being done is identifying gaps on the network in order to quantify the benefits or disadvantages that the freight industry is experiencing.

The Principal Policy Officer for Freight also addressed the issues of Decarbonisation, Modal shift and Freeports.

On the issue of Decarbonisation she addressed the issues of decarbonisation on the roads and the rail network. Regarding modal shift she explained that this will have a key focus in the strategy; however there are a number of things still currently unknown, specifically in the demand data.

On Freeports the Principal Policy Officer for Freight expressed delight to see the Government's announcement in the Budget on these.

- 6.2 In relation to section 4.9 of the report the Chair requested that more should be added around the quantity and quality of the freight lines.
- 6.3 Cllr Hughes suggested the possibility of the Stainmore line reopening as this could be a good line for freight to use.

The Principal Policy Officer for Freight explained that she is looking for things that a business case can be delivered on and when presenting ideas to Government the lists needs to be short and believable. Got to be realistic and targeted. Network rail doing a detailed piece of work.

-
- 6.4 Cllr Chaytor highlighted the reconnection of the Minsters line as a possible solution for getting freight across the Pennines. However he believes that electrification in and out of the ports, out of Hull, Immingham and Grimsby docks is of crucial importance.

Resolved:

That the Committee note progress and timescales outlined in the report.

7. Decarbonisation Strategy

- 7.1 Members received the report on the Decarbonisation Strategy from the Interim Strategy and Programme Director. The Principal Environmental & Sustainability Officer then highlighted the key points in the report and his presentation.

- 7.2 The Chair asked whether targets for modal shift will be included in the strategy such as policy commitments and modal shift figures.

The Principal Environmental & Sustainability Officer explained that targets will be included in relation to policy commitments for example demand reduction figures.

- 7.3 Cllr Groves asked if there is any work running parallel to the strategy assessing carbon on transport schemes.

The Principal Environmental & Sustainability Officer explained that embodied carbon is not currently included within the trajectory; however firmer commitments have been made by TfN within the strategy in relation to TfN-led schemes.

- 7.4 Cllr Fenton asked how Local Authorities can help support modal shift.

The Principal Environmental & Sustainability Officer explained that the Strategy will have some guidance around level of change around modal shift which have been tested in terms of potential for emissions reductions by our consultants. He also highlighted the risks and issues on electric vehicles.

Resolved:

- 1) That the report be noted;
- 2) That the Committee notes the progress made and agrees to TfN continuing the preparation of its Decarbonisation Strategy, utilising the recommended provisional Decarbonisation Trajectory, and incorporating a close to zero date in advance of 2050 with a view to agreeing both at TfN Board in March 2021.

8. Exclusion of Press & Public

Resolved that the public be excluded from the meeting during consideration of Item 9 on the grounds that:

It is likely, in view of the nature of the business to be transacted or the nature of the proceedings, that if members of the public were present during such item(s), confidential information as defined in S100A(2) of the Local Government Act 1972 (as amended) would be disclosed to them in breach of the obligation of confidence.

9. Northern Powerhouse Rail Update

- 9.1 Members received the report from the NPR Director who then took questions and comments from Members on the report.

Resolved:

That the report be noted.

Transport for the North

Monthly Operating Report

February 2021



Contents

	Page
Introduction	Page
Summary from the Chief Executive	3
Programme Summary	
Northern Powerhouse Rail (NPR)	4-5
Integrated & Smart Travel (IST)	6-7
Investment Programme	8-9
Major Road Network (MRN)	10-11
Strategic Rail	12-13
Operations Summary	14-17
Financial Performance	
Financial Update	18-19
Activity Dashboard	20
HR Update	21
KPIs (Key Performance Indicators)	22-24

Introduction

Summary from the Chief Executive

Train passenger levels remain at a low level (10-15% of pre-Covid levels) but as lockdown is eased passenger numbers will start to rise again. Much work is ongoing as part of the Roadmap to Recovery to be ready rebuild passenger numbers at the right time, reassuring previous passengers on travelling safely, and encouraging new passengers to swap to using rail.

The public consultation on the Manchester Recovery Taskforce closed on 10 March 2021. The Task Force plans to make a recommendation at the end of March then this decision will be discussed with lead officers before coming before Rail North Committee on 16 April 2021 for presentation and decision.

In response to the withdrawal of ongoing funding for the Integrated and Smart Travel programme, a closure report was considered and approved by the TfN Board on 18 February. TfN has subsequently begun implementing a closure plan for the programme that is expected to complete in the first quarter of 2021/22.

At request of the Department for Transport, the TfN Board has agreed to delay submitting the business case for Northern Powerhouse Rail until the Government's Integrated Rail Plan has been published. February's NPR Programme Board agreed that the majority of the proposed work programme for 2021/22 can commence ahead of the IRP being published. In a positive step forward survey work on the Leeds Hull line is due to commence on 6 March, helping to inform the next stages of design and development.

TfN continues to support the economic recovery of the North around Covid-19, including through engagement with the DfT's Acceleration Unit to discuss the potential speeding up of projects identified in TfN's Economic Recovery Plan.

Following approval at TfN Board on 18 February, TfN will commence the Investment Programme Benefit Analysis (IPBA) work in April 2021 Running through to spring 2022, the analysis will play a core role in shaping the next Strategic Transport plan due in 2024. During March, work will be undertaken to progress other tasks associated with the IPBA work including preparation of the Freight Modelling commission.

Throughout February, TfN colleagues have continued to work on business planning for all departments, supported by a Member Working Group, and the Board taking stock of progress on 18 February. A final version of the business plan will be put to the Board on 24 March for approval.

Following the Prime Minister's February roadmap announcement for how England will exit the current Covid-19 lockdown, TfN continues to follow Government guidance, with a return to the office currently expected no earlier than shortly after 21 June 2021, noting there will be a short lead time to re-open TfN offices safely.

Northern Powerhouse Rail (NPR)

Monthly Summary

On 18 February, the TfN Board confirmed TfN's preferred way forward in line with the initial decision taken in November 2020. The Board also agreed to the request from DfT that the completion and submission of the Strategic Outline Case (SOC) be rephased so that it can be preceded by the publication of the Integrated Rail Plan (IRP). Following the meeting, a letter was sent to the Transport Secretary providing statutory advice on TfN's preferred way forward, and seeking assurances that TfN will be consulted and involved in the development of the IRP as it relates to the North. The statutory advice also recommended that work should continue to progress toward further route and design refinement, outline business cases, and the necessary development consenting on the parts of the network that are recommended to start construction in the mid-2020s. The revised submission of the SOC will be dependent on the content and timing of the IRP.

Engagement with partners continues to ensure they are updated on progress and fully briefed on the development of the SOC.

Subsequent to any IRP announcement by Government, which may be in March, the Northern Powerhouse Rail business plan for 2021/22 will need to be updated with the new dates for SOC completion, and the programme will be reviewed for any dependencies impacted by the rephasing.

Activity Update

Infrastructure

The Draft Pre-Sequence 5 proposal, which addresses procurement strategy development for NPR, was received from Network Rail (NR) and reviewed by the NPR Programme Management Office (PMO) in the month. The team is now working to finalise the proposal over the next period with a target of a decision, by NPR Programme Board, to instruct being made in April 2021. Following endorsement at NPR Programme Board in February, activities to achieve Governance for Rail Investment Projects (GRIP) 2, with GRIP being the process by which NR manage and control investment projects, on routes to Hull have been instructed by TfN to NR and are now underway. NR is in the process of developing detailed plans for 2021/22, following NPR Programme Board endorsement of activity. NR is to present back detailed planning to NPR Programme team in March for review and finalising to support baselines to be taken following endorsement at NPR Programme Board in April.

Technical Assurance, Modelling and Economics (TAME)

Analysis and testing of the Northern Rail Modelling System (NoRMS) iteration 2 model has now commenced. The first of the new modelling partner contracts will commence in the coming days with commissioning forms submitted for the next two to follow, of these Wider Economic and Social Impacts Partner (including Northern Economic Land Use Model (NELUM)) will go to market in March Scenario planning for modelling activities to support the re-phased SOC have been presented to TfN's Senior Management Team (SMT) and DfT analytical team.

Programme Planning

The proposed scope of activity for 2021/22 was presented at NPR Programme Board in February and endorsement was received for the majority of items,

including targeted studies to support the refinement of the NPR network and the single route/hub option recommendation reached through the completion of Intermediate Sift Part 2. Areas covered here include Leeds Hub, Manchester – Sheffield and Leeds – Newcastle, as well as starting the detailed planning for Manchester – Leeds pending co-client instruction to proceed with the activity post-IRP publication. Additionally, endorsement was received for the further development of infrastructure, where a route single option has already been determined, with the aim of continuing to further refine infrastructure (inc. estimates) as well as supporting the improvement of benefits. Endorsements received are subject to continued review of the detailed scope to reduce the risk of nugatory spend on the programme prior to the publication of the IRP.

Risks

Risk Summary	Summary of Mitigating Measures	KPI
Integrated Rail Plan (IRP) The conclusions of the IRP could have consequences to the SOC if its recommendations on funding envelope, phasing and/or specifying route options are different from those agreed by TfN Board. This would result in delays to the next stage of the NPR programme both in terms of funding available for 2021/22 and scope of works (additions/removals) on permitted development. It will also affect alignment between the TRU and NPR programmes.	1. While this risk is set out as a potential delay to the SOC, it could potentially speed up the next stage of NPR development if the IRP allows more single options in corridors to be identified quickly. 2. A rapid response group is being co-ordinated which will review the IRP on release, to understand the implications on the SOC and 21/22 business plan. 3. Continue working with NR and DfT on TRU/NPR alignment.	2
Co-client agreement of 2021/22 scope We may be unable to agree as co-clients the activity for 2021/22 scheduled to start from April 2021. This would result in delays to proposed programme activity for 21/22, as well as impacts to commissioning and mobilising programme teams.	1. Infrastructure scope workshops are taking place with co-client and NR to review and agree scope. 2. Discussions are ongoing at a senior co-client level.	N/A
Government-led network The NPR network may be decided by the Government. This may result in partners not agreeing with the suggested network, leading to programme delays, or result in a significant disagreement affecting progress.	1. For the current preferred way forward options that the Government is likely to challenge, TfN will present the evidence base where the minimum viable option, such as on the Man-Liv route, should not be chosen. This will include undertaking network reliability analysis.	N/A

Programme and Look Ahead

TfN Board
24 March 2021: Summary of IRP implications for NPR (if received pre-Board).

Integrated and Smart Travel (IST)

Monthly Summary

As no funding has been confirmed we are now implementing a closure plan for the programme which we expect to be completed by the end of the first quarter of 2021/22. As part of business planning for next year, we are seeking the Board's approval to create a new role within the Strategic Rail team to embed smart activity and delivery of digital fares going forward. This will be resourced through an allocation of Core funding.

The programme continues to work with Train Operating Companies to deliver Phase 1, focusing on completion of works to enable the roll out of flexi seasons and on-board retailing and validation. All Phase 2 deliverables are complete.

Activity Update

Phase 1 - Smartcards on Rail

The Merseytravel/Merseyrail online retailing offer (Railpass season tickets), supported by Platform Validators (PVals) at their 66 stations delivered through Phase 1, has now been made available to the public. Northern flexi-seasons are now available along seven routes, with DfT approving a further two routes in February (Leeds to Knottingley/Pontefract; Leeds to South Milford/Gilberdyke to Hull).

Northern's live trial of STAR Mobile (on-board retailing and validation) also on behalf of TPE (TransPennine Express), is well advanced. It is now being trialled on 20 handheld devices, with completion forecast in mid-March. This will complete the workstream.

Phase 2 - Improving Passenger Information

Disruption Messaging Tool (DMT) – The supplier provided, and the IST Programme have signed off, improved reporting for user activity. All paid-for deliverables for the entire phase are now completed.

DfT has expressed an interest in adopting the DMT nationally as part of the suite of tools available through their Bus Open Data platform. The IST team has provided information to support a formal DfT decision in mid-March. Otherwise, as envisaged in the Final Business Case, TfN will operate the DMT and Open Data Hub (ODH) on behalf of LTAs until March 22, providing LTAs with time to make their own contractual arrangements with the suppliers after this date.

Phases 3 and 4 - Contactless on Rail and Local Smart Schemes

Closure activities have begun including work on lessons learned from the Innovation Procurement.

Risks

Risk/Issue Summary	Summary of Mitigating Measures	KPI
Risk: Phase 1 - The challenges faced with validation equipment may delay the introduction of smart flexi-seasons in Greater Manchester and the Bradford areas, which could result in costs running into 2021/22.	<ol style="list-style-type: none"> 1. The supplier, S&B have scheduled bug fix for gate upgrade for delivery w/c 22 March. 2. Northern and TfN are working with Manchester City Council's planning department to expedite outstanding consents to listed buildings. 3. TfGM validator configuration testing has commenced. 4. DfT has agreed to fund the project through to completion of the works 	3
Risk: Phase 2 – Due to late decision-making and the uncertainty of DfT to take ownership of the DMT tool, it is likely that arrangements to support DMT from March 2021 might not be implemented in good time. This could result in service disruption to LTA users and pressure to expedite putting in place service management.	<ol style="list-style-type: none"> 1. If there is no DfT agreement to take on the DMT in mid-March TfN will revert to its plan of supporting the DMT until March 2022 and IST will handover service management to TfN central IT. 2. Agreement with DfT and Bus Open Data Team of a plan of activities to transfer ownership and handover the DMT to begin as soon as possible, with workstreams working in parallel. 	4
Issue: Phases 3 & 4 – DfT has informed TfN that there was no funding allocation for the IST programme in 2021/22 and therefore we are winding down these Phases.	<ol style="list-style-type: none"> 1. Seek approval within the business plan to create a new role within the Strategic Rail team to embed smart activity and delivery of digital fares going forward. It is proposed that this will be supported by an allocation of Core budget. 	5

Programme and Look Ahead

Phase 1

Northern to finish the live trial of STAR Mobile (on-board retailing and validation), ready for deployment both to Northern and TransPennine Express (to be actioned after project close).

Successful completion of S&B's gate upgrade development in Greater Manchester and Bradford areas.

Final Northern PVal civils work and fitting heads to PVals at Manchester Piccadilly and Deansgate stations.

Phase 2 - Disruptions Messaging Tool

DfT to take a decision about whether it is to take ownership of the tool instead of TfN retaining ownership until the end of March 2022. Handover of the DMT to DfT. Handover of ODH to TfN IT (until such time as the contract terminates).

Nexus (Transport for Tyne and Wear) to increase the amount of planned disruptions for all modes entered on the tool and provide certainty about when they will enter unplanned disruption across modes.

Phases 3 & 4

Complete lessons learned and project closure.

Investment Programme

Monthly Summary

Following approval at TfN Board on 18 February, we will commence the Investment Programme Benefit Analysis (IPBA) work in April 2021. The IPBA commission is critical to understanding the economic, social and environmental benefits of the TfN Investment Programme. The analysis will use DfT's conventional growth scenario, and TfN's four Future Travel Scenarios, to assess the Investment Programme against three different funding strategies. This work will enable TfN to make a strong evidence-based case for transport investment and provide a clear picture of the potential impact of the Investment Programme on carbon emissions.

Activity Update

The tendered bids for the IPBA commission have now been assessed and TfN has identified a preferred bidder. The contract will be awarded at the end of March.

During February:

- Work on updating the TfN Interventions Log, which maps the road and rail schemes in the Investment Programme, is ongoing, and takes account of recent decisions regarding the NPR programme. The Interventions Log will be regularly updated and also includes schemes that are under consideration, but do not form part of the TfN Investment Programme.
- A commission to bring forward coding of the Investment Programme interventions into TfN's transport models has been procured to help de-risk the main commission.
- A commission for freight modelling to support the main IPBA commission has been agreed and the contract will be awarded in March.
- The team has invited members of the Strategic Oversight Group and their colleagues to join IPBA briefings in March, which will provide Members with an understanding of the project scope, management processes including engagement with partners and the technical process.

Risks

Risk/Issue Summary	Summary of Mitigating Measures	KPI
NPR Alignment – Risk: A number of interdependencies with NPR and TAME have been identified – including the reference case, model development, internal resource requirements, and freight modelling. The delay in publishing the IRP increases the risk that the final IPBA outputs might not be fully aligned with the preferred NPR network (when agreed) and the final design of HS2 and TRU. If not addressed, all of these issues could lead to increasing costs and delays in the IPBA programme, as well as reputational impacts for TfN. The delay in publishing the IRP increases the risk that the final IPBA outputs might not be fully aligned	<ol style="list-style-type: none">1. Identify latest date for NPR/HS2/TRU decisions to feed into IPBA project, noting in the Appraisal Specification Report (ASR) that work is based on assumptions made on the proposed and agreed date.2. Revisit IPBA reference case assumptions with partners in April, to ensure there is an agreed baseline to work with.3. Management capacity is being strengthened within the modelling team to manage the allocation of TAME resources between TfN programmes. This will give TAME flexibility to respond to short term resource requests from NPR	10

with to the preferred NPR network (when agreed) and the final design of HS2 and TRU.	and protect allocation of key TAME resources to IPBA.	
Analytical Framework – Risk: IPBA is reliant on the Analytical Framework's models with several new variables that require thorough testing and assurance. In the event that the models are not developed and ready to be used, there is a risk of failing to meet Business Plan commitments and the deliverability of the Strategic Transport Plan could be at risk. Further work may likely be required, costing TfN additional resources such as time and funding to ensure its deliverability.	<ol style="list-style-type: none"> 1. To continue holding monthly meetings to track interdependencies and monitor potential risks. 2. The modelling and appraisal team to continue providing monthly updates on the framework's development and state of readiness. 3. Review the scope of work against progress during IPBA's Gateway Review Point (GRP). 	10

Programme and Look Ahead

- Continue to monitor risks and progress the commissioning process as far as possible to ensure a start in April 2021.
- The contract for IPBA will be awarded in March, so that the contract will start in April 2021.
- A commission for freight modelling to support the main IPBA commission has been agreed and the contract will be awarded in March.
- IPBA project briefings for partners will take place in March.

Major Road Network (MRN)

Monthly Summary

The Major Roads team is continuing to monitor the progress of projects that were recommended for MRN funding (including Large Local Major schemes) in the 2020-2025 period. Further work on completing the Major Roads Report is waiting on publication of the DfT's Transport Decarbonisation Plan and TfN's Decarbonisation Strategy.

Activity Update

- The team has been engaging with DfT's Acceleration Unit to discuss opportunities for speeding up the delivery of projects identified in TfN's Economic Recovery Plan.
- The team is continuing to monitor the impacts of Covid-19 on travel, and is engaging with DfT, Highways England (HE) and TfN partners on sharing transport data.
- Through work with colleagues in TAME, the team has developed an online 'Power BI' tool enabling partners to access and analyse journey time, reliability, and origin/destination data on the MRN. Access can be granted to TfN partners, subject to receipt of a licence agreement, and access to Power BI software. Each Local Transport Authority has been provided with a summary of local mobile data insights for their area.
- The team submitted an officer response to the Transport Select Committee Inquiry on zero-carbon vehicles and road charging, following comments from partners.
- The team worked in partnership with other Sub-national Transport Bodies on submitting a response to DfT's 'Future of Transport: Rural strategy call for evidence.'
- The team has produced an initial scope for a project developing recommendations on the infrastructure required for electric and hydrogen vehicle refuelling. This workstream will be considered alongside other priorities in the business planning process.
- TfN has procured MDS Transmodal, a freight consultant, to produce four credible reference case scenarios in terms of freight origin-destination and mode choice, against which different interventions can be tested. These will be aligned with TfN's Future Travel Scenarios.

Risks

Risk/Issue Summary	Summary of Mitigating Measures	KPI
Risk: Negative perceptions - Due to the environmental and sustainability impacts of traffic and congestion, stakeholders might assume	1. Working with the Stakeholder Engagement & Communications Team (SECT) to develop a clear narrative on why roads are a critical part of the transport network, and how future management of, and investment in, roads can support the North's vision for a sustainable future.	6

<p>that road investments could be worsening the situation e.g. greenhouse gas (GHG) emissions. As a result, there is a risk that the road schemes might not get the investment needed to deliver the Strategic Transport Plan (STP).</p>	<ol style="list-style-type: none"> 2. Work to address this topic in the Major Roads Report and work with SECT to develop an appropriate comms plan. 3. Use our Future Travel Scenarios evidence to inform work and communications, and monitor impacts of Covid-19 on travel behaviours, patterns and flows. 4. Await the outcome of DfT's Transport Decarbonisation Plan (Spring 2021) and use this to help inform TfN's Decarbonisation Pathway. 5. The Investment Programme Benefit Analysis project to enable TAME to build the Analytical Framework, which can be used to demonstrate the real impact of road investment and different policy measures. 	
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Programme and Look Ahead

- TfN will work with DfT to review evidence for the Trans-Pennine Tunnel (TPT) and M6-A1(M) studies and agree the next steps.
- The team is continuing to support the development of TfN's draft Freight and Decarbonisation Strategies, both due to be considered at TfN Board in March.
- Highways England has asked TfN to support the statutory public consultation events for the A66 dualling project, which will take place this Spring.

Strategic Rail

Monthly Summary

The operational focus remains on supporting Covid-19-related work and planning for recovery through the North of England Contingency Group and Rail North Officer Group (Operations) working closely with Rail North Partnership (RNP). The team is continuing to support the Manchester Recovery Task Force timetable consultation. TfN continues to work closely with the DfT and Network Rail on a range of investment plans across the North of England, including schemes to address congestion hotspots in central Manchester, train lengthening (capacity) and decarbonisation as part of the Manchester and North West Transformation Programme, and a number of projects around Leeds.

Activity Update

Rail Operations

We continue to monitor Covid services and demand. Train operators have reported that passenger demand has increased slightly to 10% (TransPennine Express) and 15% (Northern) of pre-Covid levels in February.

The Manchester Recovery Task Force consultation continues to seek the views of the public and stakeholders on rail timetable options to address the poor performance of the rail network in the Manchester area and Member and Officer briefings have taken place. The consultation will inform decisions to be made in Spring 2021 on potential changes to the timetable that would be implemented from May 2022. Rail North Committee will consider the next steps at a meeting in April 2021.

Rail Investment

The Outline Business Case for the Transpennine Route Upgrade (TRU) has been deferred pending the Government's publication of the Integrated Rail Plan (IRP) for the North and Midlands which is anticipated in March 2021. The IRP is likely to influence the scope choice for TRU and NPR between Manchester and Leeds. In the meantime, initial work, including a major blockade in the Manchester area in summer 2021, is progressing.

TfN continues to work to secure the right infrastructure package for central Manchester and support partner authorities on local schemes, including the Energy Coast Rail Upgrade in Cumbria, a new Skelmersdale rail link, and station capacity improvements at Darlington, Middlesbrough and Leeds. A high-level pan-Northern trip rate model to assess the potential number of trips made by a new station or new line has been completed which will allow a quick assessment of proposals, in advance of the completion of the Investment Programme Benefits Analysis during 2022.

Risks

Risk/Issue Summary	Summary of Mitigating Measures	KPI
Risk: The short-term effect of Covid-19 on the reintroduction of services on to the network – Services could be further impacted by resource levels among operators and restrictions around staff training. This will impact on localised areas which will	<ol style="list-style-type: none">1. TfN continues to work closely with operators to review timetables in advance of changes and to feed in key areas of concern to be addressed.2. Driver training continues and operators are planning future service uplifts based on their	9

<p>see reductions in connectivity and frequency until driver training is delivered. Furthermore, the rollout of further new trains will also be delayed possibly leading to a reliance on older rolling stock.</p>	<p>known resource plans which RNP is keeping under review.</p> <ol style="list-style-type: none"> 3. Now that a roadmap to lifting restrictions has been issued the focus from Strategic Rail and RNP will be on short term recovery whilst still focusing on supporting the recovery of demand as restrictions ease. 	
<p>Risk: The long-term effect of Covid-19 on the viability of train services</p> <ul style="list-style-type: none"> - The third national lockdown and tighter restrictions on travel are likely to further affect the time it will take for the industry to recover to pre-Covid-19 levels. This may impact the future of train service investment decisions which might affect TfN's ability to achieve its ambition for the North of England. 	<ol style="list-style-type: none"> 1. TfN's Economic Recovery Plan, including the "quick win" programme, has been issued to the DfT's Acceleration Unit and TfN continues to liaise with the Unit. 2. Messaging and communications will continue to promote safe use of public transport and protect services for key workers in line with Government guidelines. 3. Rail North Committee has endorsed a Roadmap to Recovery. The team is working with train companies, identifying ticketing/marketing/offers to rebuild confidence, attract passengers back, and entice new passengers when appropriate. 	9
<p>Issue: Delayed publication of the Williams Review - The coronavirus pandemic has meant DfT has had to focus its resources on response. This has led to the continued delay in the publication of the Williams Review. TfN had planned to provide a response to Williams as a KPI for this financial year, however this will no longer be possible. In parallel, franchise agreements have been replaced with alternatives.</p>	<ol style="list-style-type: none"> 1. TfN will continue to make the case for reform that supports the North's ambitions and will respond to the Williams White Paper once published. 2. To mitigate the risk further, TfN is working with partners and external consultants to shape our response when the White Paper is published. 3. TfN continues to work with Rail North Partnership to shape the delivery commitments for the new service agreements. 4. To mitigate delays, TfN is working with partners to begin preparatory work in advance of expected publication in Q1 2021/22. 	8

Programme and Look Ahead

- Support, monitor and help shape the industry response to Covid-19 and, when appropriate, to rebuild services, passenger demand and confidence.
- Work with operators for further timetable changes including May 2021.
- Working through the Rail North Committee and TfN Board, consider the outcome of the Manchester Recovery Task Force consultation and identify the right infrastructure enhancements for Manchester.
- Develop proposals for addressing network gaps linked to the Long-Term Rail Strategy (LTRS) and produce a delivery plan for the TfN Stations Strategy.
- Continue to support TfN input and response to the Integrated Rail Plan.
- Continue to work closely with DfT and Network Rail to secure successful delivery of the TRU project objectives.
- Begin the process to seek funding from the Rail Network Enhancement Fund to undertake a pan-Northern Theoretical Line Speed analysis to identify the line speed capability of railway assets.
- Continue to work with TransPennine Express, Northern and Network Rail to identify interventions that will improve the reliability and resilience of the rail network and inform TfN's Reliability Delivery Plan.

Operations Summary

Monthly Introduction

Operational colleagues during February have focused on; communications teamworking to promote and engage in the Manchester Recovery Task Force services consultation; Finance and Procurement have continued working on business planning and budgeting and developing a long-term procurement strategy; Legal and Democratic are continuing to hold virtual public meetings while monitoring developments around being able to continue these beyond May if necessary; Strategy continues the development of the Decarbonisation Strategy, Freight and Logistics Strategy, and the roadmap to the revised Strategic Transport Plan (STP); and TAME continues their work on models including NoRMS, NELUM and NorMITS to fulfil the requirements of programmes including NPR and IPBA.

Activity Update

Summary updates on key actions from TfN operational teams are as follows:

Stakeholder Engagement & Communications Team (SECT)

- SECT has been promoting TfN's activity across external and internal channels, proactively where possible.
- This month has included promotion of the statutory advice to Government on the preferred Northern Powerhouse Rail network, including proactively with the media and on social media.
- TfN received significant media interest in proposed budget reductions. However, due to the nuanced issues in the budget, where the plan is to have a budget spending more next year than we have spent this year, we chose not to issue an external response.
- TfN has continued to promote and actively engage in the Manchester Recovery Task Force services consultation, including facilitating roundtables with officers and TfN Members.
- The team has also proactively taken part in communications on industry updates, including input into media releases by Highways England on key schemes in the North.
- External content and messaging has maintained a focus on evidence-led investment decisions and TfN preferences, including but not limited to coverage of TfN February Board meeting; promotion of TfN's Future Travel Scenarios; a look ahead to infrastructure commitments in the Budget; and links to the rail services consultation.
- Channels have also signposted important corporate and project updates to key audiences, including promoting the recruitment of a new TfN Chief Executive (whilst the vacancy was open), and the start of works on the Transpennine Route Upgrade.
- Plans to proactively promote the start of ground investigation work on the Leeds to Hull route of Northern Powerhouse Rail have been put on hold

until after publication of the Integrated Rail Plan, whilst work is underway on the external business plan to be published in April and the launch of public consultation on the Decarbonisation Strategy, anticipated to be launched in May/June 2021.

The team has continued to roll out regular internal communications, including in support of the ongoing business planning process for 2021/22. This has included updates regarding the way forward on IST and implementation of the programme closure plan.

Finance & Procurement

- The Finance team, supported by procurement, has been focused on business planning and the preparation of the 2021/22 budget that will be provided to the 24 March Board. It is also engaged with DfT and the NPR Programme team to finalise TDF funding arrangements for the remainder of 2020/21 and 2021/22.
- The Procurement team is working closely with TAME/NPR colleagues to manage the procurement pipeline and develop the long-term procurement strategy for the coming year and beyond. In addition, a number of procurements/contract extensions have been awarded, including Mobile Device Data, NorMITS Demand Partner, and the IPBA support contract.
- The implementation and roll-out of TfN's new risk management software is underway.

Legal & Democratic

- Virtual public meetings continue to be held; the TfN Constitution includes formal procedure rules for this purpose. Regulations allowing virtual meetings are currently due to expire on 6 May 2021. Lawyers in Local Government (LLG) has obtained legal advice that secondary legislation is already available and/or existing legislation would be sufficient to extend beyond 6 May; LLG is seeking a declaration from the courts to secure confirmation that virtual meetings remain a choice after 6 May. A report to Board on 24 March will address future options.
- The TfN Modern.Gov website, system and "restricted app" are all now in place and working well and further benefits of the system are being explored for future introduction. The team continues to support procurement governance and provide general legal advice across a wide range of areas within TfN.

Strategy, Policy, Economics & Research

- Development of TfN's Decarbonisation Strategy continues on track to be submitted to the March TfN Board meeting. An initial draft of the strategy, including proposals for a pan-Northern carbon trajectory, was considered at the Partnership Board in February and garnered general support for its contents and direction. Board Members highlighted the need to emphasise the clear economic growth opportunities for the region through decarbonisation (clean growth), within the strategy. The final elements of the strategy looking at clean growth opportunities and decarbonisation

policy analysis, are now complete, and inputs are being incorporated in time for March TfN Board.

- In relation to the evolving Decarbonisation Strategy, separate engagement sessions have been undertaken with the electricity Distribution Network Operators (DNOs) and representatives from the Environmental Transport Organisations (ETOs) and the Climate Change Committee (CCC).
- The tender for consultation support for the public consultation on the Decarbonisation Strategy is currently out for procurement, with confirmation of appointment dependent on the outcome of the March TfN Board.
- Partnership Board received a briefing on the Freight and Logistics Strategy in February 2021. The approach received a positive response from Members. Partner officers will receive the draft technical documentation for review in early March 2021. We will be seeking approval from a future TfN Board, with the intention to undertake a consultation from the summer of 2021.
- The team and the other English Sub-national Transport Bodies submitted a joint response to the DfT's Rural Mobility consultation which closed on 16 February.
- Work continues to map out a roadmap to a revised Strategic Transport Plan (STP) for publication in February 2024. Once the roadmap and programme are complete it will be agreed through TfN governance for early feedback from officers and Members.
- A proposed programme of work for 2021/22 is currently being developed to support and embed the Northern Transport Charter's (NTC) ambitions across TfN. Identified activities include scoping proposals for a citizens' panel, and piloting an Independent Audit/Assurance Group to provide Board with independent advice to support decision-making on key decisions. To oversee the NTC programme we intend to establish a new Member Working Group early in the new financial year.
- The Economics and Research team has started work on three new research projects which will play an important role in shaping the evidence behind our second Strategic Transport Plan:
 - Visitor Economy and Transport in the North of England (January – June 2021, working with Atkins and The Leisure Consultancy)
 - User Insight into Pan-Northern Travel - Phase 3 (February – August 2021, working with SYSTRA)
 - Transport-related Social Exclusion in the North of England (February – August 2021, working with Social Research Associates and Temple)

The Economics & Research team also continues to develop a Monitoring & Evaluation Strategy and Monitoring & Evaluation Framework for TfN, setting out processes for embedding a cycle of evidence-based policy-making within TfN's activities, and measuring progress towards the achievement of Strategic Transport Plan objectives. Draft versions of the M&E Strategy and Framework will be shared across TfN for feedback in March 2021 before being progressed through governance.

TAME (Technical Assurance, Modelling & Economics)

- TAME is busy scenario planning after the recent announcement of the delay to the NPR Strategic Outline Case (SOC). Key to this is identifying opportunities for further use of the Analytical Framework to support the case for NPR which come into scope with an extended timeframe.
- TAME's suppliers have delivered the updated Northern Rail Modelling System (NoRMS) iteration 2 model, which includes an updated modelled base year to represent 2018. TAME is now working with this model version in a period of verification testing and model assurance. TAME will work closely with the DfT to gain model acceptance, with the view that this version of NoRMS can be used in the forward SOC programme.
- The Northern Economy and Land Use Model (NELUM) is also being updated to represent a base year of 2018; and the update will bring NELUM in line with NoRMS iteration 2. The updated version of NELUM is scheduled to be available from the end of March; and will also be used within the forward SOC programme.
- TAME is further supporting NPR, providing modelling and analysis to feed into a series of individual business cases at NPR stations.
- TAME is currently on track to produce a version of the Analytical Framework which will be ready and fulfils the requirements for the start of the IPBA programme. TAME is working hard to further develop the Northern Model Integration Tools (NorMITTS) to produce future year demand matrices for both NoRMS and the Northern Highway Assignment Model (NoHAM).
- TAME recently supported the Strategy team in delivering and presenting the Decarbonisation Strategy to TfN's February Board. Work is now underway to finalise the analysis and supporting narrative in the Decarbonisation Strategy to be presented at the March Board.
- TAME has worked with TfN Strategic Rail colleagues to forecast passenger benefits from a number of infrastructure interventions around Leeds station. Estimates have been generated using NoRMS iteration 2. Further work is planned in the coming weeks
- TAME is developing a plan for a major rail data collection exercise to support the NPR programme. This is likely to involve a number of station passenger counts and user interviews to build evidence on journey purpose, frequency of travel and attitudes to rail in a post-Covid environment.
- Good progress has been made in implementing TAME's procurement plan, with several substantial procurements for 2021/22 due to be released to the market in the first few weeks of March.

Financial Performance

Financial Update

Summary

Expenditure incurred in February: £4.98m

Variance to monthly budget: Underspend of £1.49m

Year to-date expenditure: £49.04m

Year to-date variance to budget: Underspend of £6.67m

Headlines

- February figures continue to be monitored against the Revision 2 budget.
- Underspend to date is driven by reduced programme activity, primarily on the NPR programme.
- The Core operational underspend reflects the effects of the pandemic and the uncertain funding environment in which TfN has been operating for most of the financial year.

Programmes:

- Expenditure of £4.39m represented an underspend of £1.13m (20%) in the month. YTD expenditure of £42.68m, an underspend of £5.39m (11%).
- The main driver of underspend continues to be the NPR programme.

Integrated & Smart Travel:

- Programme-wide expenditure of £0.50m represented an overspend of £0.03m in the month. On a YTD basis, expenditure of £8.2m resulted in an underspend of £0.65m (8%), as a result of the factors set out below:
 - Phase 1 expenditure of £0.3m in the month represented an overspend of £0.03m due to the rephasing of some costs. Expenditure remains under budget on a YTD basis reflecting some savings and unrequired use of contingency.
 - There has been minor rephasing of expenditure in Phase 2. YTD expenditure is £0.05m ahead of budget.
 - As a result of IST funding decisions, expenditure in the programme team and Phase 4 continues to be lower than forecast.

Northern Powerhouse Rail

- Expenditure of £3.84m represented an underspend of £1.12m (23%) in the month. YTD expenditure of £34.03m is 12% under budget.
- Underspend continues to reflect revised forecasts and a lower level of activity as a result of uncertainty pending the publication of the IRP. These underspends are set out in greater detail below:

- Network Rail underspend to date of £2.6m (10%).
- Modelling underspend to date of £0.45m. Underspend includes customer and travel survey work which has been postponed due to Covid-19.
- A YTD underspend of £1.49m (20%) in other programme development areas is driven by a revised cost and activity schedule for survey work and, early contractor engagement activity which has not been taken forward at this stage.
- Programme support costs to date are within 2% of budget.
- There is a YTD underspend of £0.04m in communications and stakeholder engagement activity, as no commitment has been granted by DfT for this activity.

Strategic Development Corridors (SDC)

- YTD expenditure of £0.48m has resulted in an underspend of £0.12m. This reflects some delays to contracting as a result of a reduced funding allocation and consequential delays to business planning. However, this is now progressing. The postponement of publication of the Major Roads Report has also led to reduced communications and stakeholder engagement costs.

Operations:

Rail Operations

- YTD expenditure of £1.99m represents an underspend of £0.18m (8%). This is driven by several vacancies in the team, in addition to a lower than expected run rate on consultancy expenditure.

Operational Areas

- YTD expenditure is £4.37m, which represents an underspend of £1.10m.
- This reflects a number of areas of savings and slippage, identified since the adoption of the Revision 2 budget, both as a result of the on-going pandemic and due to funding uncertainty following the postponement of the comprehensive spending review.
 - £0.42m of underspend in the Strategy & Policy area, a combination of delayed activity and savings.
 - £0.13m saving on the ERP development contract in relation to the flexitime module.
 - £0.14m underspend on ICT and accommodation, including the postponed Covid-related office redesign.
 - £0.13m underspend on communications and stakeholder engagement due to all engagement taking place virtually.
 - £0.13m underspend in Finance, due to reduced external support costs.
 - £0.08m underspend in HR, due to reduced travel pass costs and recruitment fees.

Activity Dashboard

TRANSPORT FOR THE NORTH FINANCE DASHBOARD					PERIOD BUDGET CYCLE	11 REVISION 2	FEB 2020/21		
PERIOD ACTUALS VERSUS BUDGET									
	Actuals £m	Budget £m	Var. £m	Var. %					
Integrated and Smart Ticketing	£0.50	£0.47	-£0.03	-5%					
Northern Powerhouse Rail	£3.84	£4.96	£1.12	23%					
Major Roads	£0.05	£0.09	£0.04	41%					
Programmes	£4.39	£5.52	£1.13	20%					
Rail Operations	£0.20	£0.23	£0.03	11%					
Operational Areas	£0.39	£0.73	£0.34	46%					
	£4.98	£6.48	£1.49	23%					
PERIOD ACTUALS VERSUS BUDGET: PROGRAMMES									
	Actuals £m	Budget £m	Var. £m	Var. %					
IST: Phase 1	£0.30	£0.27	-£0.03	-13%					
IST: Phase 2	£0.05	£0.04	-£0.01	-14%					
IST: Phase 3	£0.00	£0.00	£0.00	-					
IST: Phase 4	£0.01	£0.01	£0.01	53%					
IST: Programme	£0.14	£0.15	£0.01	5%					
Northern Powerhouse Rail	£3.84	£4.96	£1.12	23%					
Major Roads	£0.05	£0.09	£0.04	41%					
	£4.39	£5.52	£1.13	20%					
YEAR TO-DATE ACTUALS VERSUS BUDGET									
	Actuals £m	Budget £m	Var. £m	Var. %					
Integrated and Smart Ticketing	£8.20	£8.83	£0.63	7%					
Northern Powerhouse Rail	£34.00	£38.65	£4.65	12%					
Major Roads	£0.48	£0.60	£0.12	19%					
Programmes	£42.68	£48.07	£5.39	11%					
Rail Operations	£1.99	£2.17	£0.18	8%					
Operational Areas	£4.37	£5.47	£1.10	20%					
	£49.04	£55.72	£6.67	12%					
YEAR TO-DATE ACTUALS VERSUS FORECAST TO OUTTURN									
	Actuals £m	F/cast £m	Var. £m	Var. %					
Integrated and Smart Ticketing	£8.20	£8.71	£0.51	6%					
Northern Powerhouse Rail	£34.00	£42.02	£8.02	19%					
Major Roads	£0.48	£0.55	£0.07	13%					
Programmes	£42.68	£51.28	£8.60	17%					
Rail Operations	£1.99	£2.31	£0.32	14%					
Operational Areas	£4.37	£5.27	£0.90	17%					
	£49.04	£58.86	£9.82	17%					
FUNDING YEAR TO DATE									
	Actuals £m	Budget £m	Var. £m	Var. %					
Funding Stream									
TDF - Rail	£33.13	£37.78	£4.65	12%	TDF - Rail	£33.13	£41.07	£7.94	19%
IST - Capital and Revenue	£8.20	£8.83	£0.63	7%	IST - Capital and Revenue	£8.20	£8.71	£0.51	6%
Core Grant	£6.31	£7.64	£1.33	17%	Core Grant	£6.31	£7.52	£1.21	16%
Rail North Grant & Contributions	£1.19	£1.21	£0.02	2%	Rail North Grant & Contributions	£1.19	£1.30	£0.11	8%
TDF - Roads	£0.00	£0.00	£0.00	-	TDF - Roads	£0.00	£0.00	£0.00	-
Trading Income	£0.22	£0.25	£0.04	15%	Trading Income	£0.22	£0.26	£0.05	18%
	£49.04	£55.72	£6.67	12%					
FUNDING FORECASTS TO OUTTURN									
	Actuals £m	F/cast £m	Var. £m	Var. %					

HR Update

Human Resources Update

Salaried Establishment as at **5 March 2021**

Established Permanent/Fixed-term Posts

Area	Permanent Posts (Over 2 years)	Fixed-term Posts (Up to 2 Years)	Total Establishment
CEO Office	2 (2.00 FTE)	-	2 (2.00 FTE)
Support Services	29 (28.32 FTE)	6 (6.00 FTE)	35 (34.32 FTE)
Operational & Delivery	91 (89.10 FTE)	38 (37.60 FTE)	129 (126.70 FTE)
Total Establishment	122 (119.42 FTE)	44 (43.60 FTE)	166 (163.02 FTE)
Strength (in post)	103 (101.10 FTE)	26 (25.60 FTE)	129 (126.70 FTE)
Appointed (start date pending)	0 (0.00 FTE)	0 (0.00 FTE)	0 (0.00 FTE)
Active/Pending Recruitment	2 (2.00 FTE)	0 (0.00 FTE)	2 (2.00 FTE)
Vacant – On-hold	17 (16.32 FTE)	18 (18.00 FTE)	35 (34.32 FTE)

Chief Executive Recruitment – a total of seven candidates have been shortlisted, with the final selection event scheduled to take place on 22 March 2021. Barry White leaves TfN on 15 May 2021 (his last working day will be on or around 20 April 2021).

Agency Resource - Covering Vacant Established Posts

Area	Posts (FTE's)
Support Services	2 Post (2.00 FTE)
Operational & Delivery	2 Posts (2.00 FTE)
Total	4 Posts (4.00 FTE)

Consultancy Resource - Covering Vacant Established Posts

Area	Posts (FTE's)
Support Services	0 Post (0.00 FTE)
Operational & Delivery	10 Posts (9.80 FTE)
Total	10 Posts (9.80 FTE)

HR Metrics – 2020/21 Year to Date

Corporate Sickness Level:	2.7%
Employment Policy Application:	5.4%
Employee Turnover (Voluntary Leavers):	9.3%
% of Employees from an Ethnic Minority Background:	15%
% of Employees declaring a Disability:	12%
Gender Mix - % of Female Employees: % of Male Employees:	40% 60%

KPIs

Key Performance Indicators

Transport for the North's Key Performance Indicators (KPIs) are outlined in the published Business Plan for 2020-21. The below table outlines the programme and organisational KPIs and provides a summary of the year-end position.

Key	Number of KPIs with this status
Achieved	4
On Track	4
In Progress	2
Delay	2
Delay – beyond this year end (BTYE)	4

Area	KPI	Detail	Progress	Status
Corporate	1	Agree with Government the phasing and prioritisation of the Integrated Rail Plan for High Speed North. December 2020	Delay	
			TfN has submitted further statutory advice to Government on the Integrated Rail Plan. The IRP was expected to be published in December but is now expected no earlier than March 2021.	
Northern Powerhouse Rail	2	Agree and submit Strategic Outline Case to Government. January 2021	Delay BTYE	
			TfN Board (18 Feb 21) agreed to the request from DfT that the completion and submission of the Strategic Outline Case (SOC) be rephased so that it can be preceded by the publication of the Integrated Rail Plan. As such, the scheduled completion date of March 2021 will not be achieved.	
Integrated and Smart Travel	3	Complete the delivery of the Integrated and Smart Travel on Rail Project (Phase 1). November 2020	Delay	
			MerseyRail has completed installation of PVals at all 66 stations. Northern is still on schedule to complete this financial year, with residual items outstanding. The highest delivery risk is the successfully upgrading gates at Manchester stations and Bradford Interchange. The upgrades were delivered in February 2021, but require bug fixes and further testing.	
Integrated and Smart Travel	4	Complete the delivery of Phase 2 of the Integrated and Smart Travel programme (informed customers). March 2021	On Track	
			The Phase will meet the KPI. The project which delivered the Fares Tool to DfT closed in January 2021. DMT (Disruption Messaging Tool) and ODH (Open Data Hub) are in Business As Usual. All development work has been completed.	
	5		Delay BTYE	

Integrated and Smart Travel		Agree a plan for the delivery of contactless payments on rail, in collaboration with the DfT and Rail Delivery Group (Phase 3). December 2020	The IST programme will not receive DfT funding to introduce contactless payments on rail in the short/medium terms. DfT has indicated that they see this being delivered through rail reform at a national level.
Major Roads	6	Agree and approve the Transport for the North Major Roads Report. March 2021	Delay BTYE The technical report has been completed. The publication of the final Major Roads Report has been postponed so the report can take account of both the TfN Decarbonisation Strategy, and DfT's delayed Transport Decarbonisation Plan. This will not have any negative implications for other programmes.
Strategic Rail	7	Implement the recommendations in the Blake-Jones review. June 2020	Acheived The Blake-Jones Action Plan was approved at Rail North Committee in July 2020 and the team continues to embed the actions into the business as usual operating model. There are longer-term issues on funding for additional resource, and a response is awaited from DfT.
Strategic Rail	8	Develop a TfN response to the Williams Review. Within three months of publication	On Track We are ready to do this but are waiting for the Williams Review to be published and this task will be carried over into next year.
Strategic Rail	9	Support the industry and Rail North Partnership in the response to and recovery from Covid-19, including a strong focus on the needs of passengers and businesses, together with the short-term investment needed to support the recovery. March 2021	In Progress Strategic Rail is proactively supporting the industry through the crisis and recovery, for example through the Rail North Officer Group (Operations). A plan to support the economic recovery by investment in infrastructure has been developed and submitted to DfT as part of the TfN Economic Recovery Plan and work has been completed on developing a "quick win" programme which has been shared with the DfT's Acceleration Unit.
Investment Programme	10	Update and refresh the TfN Investment Programme, based on an agreed Assurance Framework and using the outputs of the SDC Qualitative Sequencing process. September 2020	Achieved The update of the Investment Programme following the qualitative sequencing process, and applying the developing Assurance Framework, has been achieved.
Strategy	11	Develop a Decarbonisation Strategy for approval by the TfN Board and ensure that this is embedded in TfN's Investment Programme Assurance Framework. March 2021	On Track The draft strategy will be presented to TfN Board on 24 March. The underpinning analysis is complete and ready to be applied in the Investment Programme Benefits Analysis work starting in April.

Strategy	12	Develop an inclusive and sustainable growth framework that will sit alongside the Strategic Transport Plan and ensure that this is embedded in TfN's Investment Programme Assurance Framework. March 2021	In Progress	
			Following completion of KPI 16, TfN has developed the necessary Analytical Framework and supporting tools, scenarios and modelling capability to embed inclusive and sustainable growth into the assessment of the Investment Programme due to commence in April 2021.	
Strategy	13	Develop a Freight Strategy for approval by the TfN Board and ensure that this is embedded in TfN's Investment Programme Assurance Framework. March 2021	Delay BTYE	
			Work on the TfN Freight Strategy is nearing completion and has been circulated to partner officers for review. The supporting evidence requires confirmation of HS2 plans through the IRP (expected in March) before the final strategy can be put to Board for approval.	
Modelling and Analysis	14	Complete and deploy the Analytical Framework throughout TfN's programmes. March 2021	On Track	
			Substantial progress has been made in preparation of the Analytical Framework for NPR and IPBA programmes, with the programme of activities to March 2021 fully mapped. Delivery is still subject to risk, as evidenced by the recent change to the NPR open-year assumption which creates a number of remedial tasks. These risks are being proactively managed by TAME programme leads.	
Organisation	15	Develop and provide a Comprehensive Spending Review submission to Government. At date set by HMT	Achieved	
			A CSR submission was provided to the DfT on 28 August in line with departmental deadlines. On 21 October the Chancellor announced a revised one-year process to conclude at the end of November. TfN submitted a supplemental SR submission to the Department, reflecting the move to a single-year settlement, on 6 November.	
Organisation	16	Develop and adopt the Northern Transport Charter. June 2020	Achieved	
			The team completed work on the remaining Northern Transport Charter (NTC) proposals which were endorsed and adopted by the Board in July. There is now ongoing follow-on work about how to embed demonstrating TfN's capability for greater devolution in next year's business plan.	



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Transport for the North Scrutiny Committee Meeting – Item 5

Subject: Corporate Governance Review and Review of the Scrutiny Function

Author: Deborah Dimock

Sponsor: Julie Openshaw

Meeting Date: Thursday 15 April 2021

1. Purpose of the Report:

- 1.1
 - a. To review the draft Annual Governance Statement and recommend it for approval
 - b. To review the operation of the Scrutiny Function since the Inaugural Meeting in April 2018.

2. Executive Summary:

- 2.1 Under Regulation 6(1) of the Accounts and Audit Regulations 2015 Transport for the North is required to carry out an annual review of the effectiveness of its system of internal controls and to publish a report of the review in its Annual Governance Statement
- 2.2 In the Annual Governance Statement for 2018/19 an action was included in the action plan for 2019/20 to develop the Scrutiny Function. This action has been carried forward to the current financial year and this report looks at the way in which Scrutiny has developed over the last three years and seeks Scrutiny Committee's views on how the function should be developed going forward.

3 Annual Governance Review

- 3.1 Under the provisions of the Regulation 6(1)(a) of the Accounts and Audit Regulations 2015 Transport for the North is required to carry out an annual review of the effectiveness of its internal systems of control and to publish a report of that review. This report, the Annual Governance Statement must be published before the beginning of June

in each year along with the Statement of Accounts and Narrative Statement.

- 3.2 In carrying out this annual review we have reviewed Transport for the North's operations during the current year against the seven principles set out by CIPFA in its guidance "Delivering Good Governance":

A Behaving with integrity, demonstrating strong commitment to ethical values and respect for the rule of law

B Ensuring openness and comprehensive stakeholder engagement

C Defining outcomes in terms of sustainable economic, social and environmental benefits

D Determining the interventions necessary to optimise the achievement of the intended outcomes

E Developing the organisation's capacity including the capacity of its leaders and the individuals within it

F Managing risks and performance through robust internal control and strong public financial management

G Implementing good practices in transparency, reporting and audit to deliver effective accountability

The draft Annual Governance Statement is attached at Appendix 1 for review.

4 Scrutiny Review

- 4.1 One of the governance actions for 2021/22 identified in the Annual Governance Statement is a review of the Scrutiny Function with particular emphasis on the principle of "Scrutiny First".
- 4.2 At the meeting of the Transport for the North Shadow Board held in February 2018 before Transport for the North gained statutory status it was decided that Transport for the North should adopt a policy of "Scrutiny First" meaning that proposals would be considered by the Scrutiny Committee before they were decided by the Board so that the Scrutiny Committee would have an opportunity of influencing the decision of the Board before it was taken rather than only having the opportunity of considering a decision after it had been taken, with no power to call decisions in. The Transport for the North Regulations and Constitution do not include a power for Scrutiny Committee to Call In decisions of the Board. The "Scrutiny First" principle has been included

in the TfN Constitution so any alteration to this would require an amendment of the Constitution by the TfN Board. The Terms of Reference of the Scrutiny Committee are set out in Appendix 2 for reference.

- 4.3 It is now appropriate for the Scrutiny Committee to review the Scrutiny First policy and to consider how well it has worked and whether the Committee wishes to recommend to the Board any amendments to the policy particularly in relation to the types of decisions which are referred for Scrutiny First.
- 4.4 The Scrutiny First principle has ensured that the Scrutiny Committee has an opportunity to comment on and inform every decision being taken by the Transport for the North Board but it has meant that the Agenda of the Scrutiny Committee has been to a large extent determined by the decisions being taken to the Board rather than the Committee developing its own work programme.
- 4.5 The Scrutiny Committee has also called for special reports to be presented to it including in respect of climate change and decarbonisation, freight and the Assurance Framework.

5 Scrutiny Panels

- 5.1 The Constitution makes provision for the Scrutiny Committee to set up Scrutiny Panels to explore particular issues of interest to the Committee but so far, the Committee has not done so. Meetings of Scrutiny Panels could be less formal than meetings of the Scrutiny Committee and could continue to be held virtually even after the current relaxation is ended and the legal requirement for attendance at Committee Meetings to be in person is reinstated.
- 5.2 The Constitution enables the Scrutiny Committee to invite anyone it chooses to attend its meetings. This means that if the Committee was carrying out an in-depth review of a particular topic it could invite an independent expert to attend its meeting to provide evidence. It is also a forum at which members of the public are allowed to speak subject to the agreement of the Committee Chair and the giving of advance notice. Previously representatives of Environmental Groups have been invited to address the Committee particularly in relation to the preparation of the Strategic Transport Plan.
- 5.3 It is appropriate for the Committee to consider as part of this review whether there are particular issues which it wishes to explore in more depth in order to make detailed recommendations to the Board. Unlike many Local Authorities Transport for the North does not have any

dedicated Scrutiny Officers but the Committee has been assisted at its meetings by senior officers from relevant programme teams and it is anticipated that this will continue to be the case.

- 5.4 Following this meeting it is proposed that a consultation exercise will be carried out to gather Members detailed views of how the Scrutiny function should be developed going forward.

6. Recommendation:

- 6.1 That the Annual Governance Statement be received and recommended for approval

That the report on the Scrutiny function be received and a that a consultation of members be undertaken, and a report brought back to a future meeting.

7 Appendices:

1. Annual Governance Statement
2. Terms of Reference of the Scrutiny Committee

List of Background Documents:

Constitution

Required Considerations**Equalities:**

Age	No
Disability	No
Gender Reassignment	No
Pregnancy and Maternity	No
Race	No
Religion or Belief	No
Marriage and Civil Partnership	No
Sex	No
Sexual Orientation	No

Consideration	Comment	Responsible Officer	Director
Equalities	A full impact assessment has not been carried out because the report does not propose any new strategy or service provision	Deborah Dimock	Julie Openshaw

Environment and Sustainability

Yes	No
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Consideration	Comment	Responsible Officer	Director
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Sustainability / Environment – including considerations regarding Active Travel and Wellbeing	A full impact assessment has not been carried out because the report does not propose any new strategy or service provision	Deborah Dimock	Julie Openshaw
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Legal

Yes

Consideration	Comment	Responsible Officer	Director
Legal	The legal implications have been considered and are included in the report.	Deborah Dimock	Julie Openshaw

Finance

No

Consideration	Comment	Responsible Officer	Director
Finance	TfN Finance Team has confirmed there are no new financial implications.	Paul Kelly	Iain Craven

Resource

No

Consideration	Comment	Responsible Officer	Director
Resource	TfN HR Team has confirmed there are no	Stephen Hipwell	Dawn Maden

	new resource implications.		
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Risk

No

Consideration	Comment	Responsible Officer	Director
Risk	There are no new risks identified as a result of this report.	Haddy Njie	Iain Craven

Consultation

Yes

Consideration	Comment	Responsible Officer	Director
Consultation	No consultation has been carried since no new policies are being proposed.	Deborah Dimock	Julie Openshaw

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Annual Governance Statement 2020/21

Introduction

This statement provides an overview of how Transport for the North's governance arrangements operate and reports on how they have been reviewed to ensure that they provide an effective system of internal control. It also summarises the governance challenges that the organisation faces, together with an explanation of what actions will be taken to implement improvements.

Transport for the North was established by the Sub-National Transport Bodies (Transport for the North) Regulations 2018 and came into being on the 1st April 2018, holding its inaugural meeting on 5th April 2018. This is therefore its third Annual Governance Statement and the organisation's Constitution, policies, procedures and systems continued to be developed during 2020/21. As a Sub-National Transport Body, Transport for the North's core functions are to prepare a transport strategy for the area and to provide advice to the Secretary of State regarding the exercise of transport functions in the area. Transport for the North is funded in these activities by the Department of Transport.

The Transport for the North Board is made up of the representatives of the twenty Constituent Authorities in the North who are the voting Members of the Board, together with representatives of the six Rail North Authorities and the Independent Chair of the Partnership Board who are all co-opted Members on the Board. At its inaugural meeting the Transport for the North Board also appointed, as co-opted members, the representatives of the eleven Local Enterprise Partnerships in the Transport for the North Area and representatives of Highways England, Network Rail and HS2.

Transport for the North's governance arrangements are set out in its Constitution. All decisions relating to the Constitution, approval of the Budget and Business Plan and adoption of the Strategic Transport Plan are reserved to the Transport for the North Board. Other decisions are delegated to Committees, the Chief Executive, and other senior officers under the arrangements set out in the Constitution. The Rail North Committee oversees the management of the performance of the Northern and TransPennine Express rail contracts under a Partnership Agreement with the Secretary of State for Transport. The arrangements under the Partnership Agreement have continued under the new arrangements which have seen the Northern franchise taken over by the Operator of Last Resort (OLR) and the TransPennine Express franchise moved onto an Emergency Measures Agreement during the Covid 19 pandemic.

The Regulations which established Transport for the North provided for the appointment of a Partnership Board to advise on matters relating to transport in the area. The membership of the Partnership Board mirrors the membership of the Transport for the North Board with the addition of a representative of the DfT. During 2019/20 Transport for the North decided to enlarge the Partnership Board and the Partnership Board now includes a representative from Disability UK, the Committee on Climate Change, Transport Focus and three regional TUC representatives.

Transport for the North has a Scrutiny Committee made up of elected Members appointed by the 20 Constituent Authorities whose role is to review the decisions of the Transport for the North Board and to make recommendations in relation to transport in the area. Transport for the North has decided to adopt a policy of "Scrutiny First" under which the Scrutiny Committee has an opportunity to comment on and influence decisions before they are made rather than scrutinising decisions which have already been taken.

Transport for the North has also established an Audit and Governance Committee consisting of five Board Members and three Independent Members, who have been publicly recruited on the basis of relevant skills, whose role is to provide assurance to the Board on governance, risk management and the internal control framework.

Since March 2020 Transport for the North, in common with the whole of the UK, has been affected by the Covid 19 pandemic. In response to the emergency, Transport for the North implemented its Business Continuity Plan and was able to move to full remote working. The implementation of the Business Continuity Plan has enabled the continuation of Transport for the North's governance arrangements and enabled its internal system of controls to continue to function.

Since March 2020 all Transport for the North's Boards and Committees have continued to meet through virtual meetings which have continued to be streamed live to the public.

1.0 Scope of Responsibility

1.1 Transport for the North is responsible for ensuring that its business is conducted in accordance with the law and proper standards, and that public money is safeguarded, properly accounted for, and used economically, efficiently and effectively. Transport for the North also has a duty under the Local Government Act 1999 to make arrangements to secure continuous improvement in the way in which its functions are exercised, having regard to a combination of economy, efficiency and effectiveness.

1.2 In discharging this overall responsibility, Transport for the North is responsible for putting in place proper arrangements for the governance of its affairs, facilitating the effective exercise of its functions, which includes arrangements for the management of risk.

1.3 Transport for the North has approved and adopted a Code of Corporate Governance, which is consistent with the principles of the CIPFA/SOLACE Framework, Delivering Good Governance in Local Government. A copy of the Code of Governance is included in Transport for the North's Constitution and is on Transport for the North's website at <http://www.transportforthenorth.com>. Alternatively it can be obtained via a written request from:

Head of Legal, Transport for the North, 4 Piccadilly Place, Manchester, M1 3BN

This Annual Governance Statement demonstrates how Transport for the North has reviewed the effectiveness of its internal systems of control and how it has complied with its adopted Code of Governance in carrying out its functions. It is

published in accordance with the requirements of regulation 6(1) of the Accounts and Audit Regulations 2015.

2.0 Delivering Good Governance in Local Government

2.1 The governance framework comprises the systems, processes, culture and values, by which Transport for the North is directed and controlled and the processes through which it accounts to and engages with the community. It enables Transport for the North to monitor the achievement of its strategic objectives and to consider whether those objectives will lead to the delivery of its goal of transformational economic growth in the North of England, facilitated by improved transport infrastructure.

2.2 The system of internal control is a significant part of the governance framework and is designed to manage risk to a reasonable level. It cannot eliminate all risk of failure to achieve policies, aims and objectives and can therefore only provide reasonable and not absolute assurance of effectiveness.

2.3 The system of internal control consists of a number of processes, policies and procedures that have been put in place in order to identify and prioritise the risks to the achievement of Transport for the North's aims and objectives, to evaluate the likelihood and resultant impact of those risks materialising, and to manage them efficiently, effectively and economically.

2.4 The governance framework was in place at Transport for the North for the 2020/21 financial year and up to the date of approval of the Statement of Accounts.

3.0 The Corporate Governance Framework

Transport for the North has adopted a Corporate Governance Framework that incorporates the following Core Principles:

1. Focusing on the purpose of Transport for the North, and the outcomes for the community, and creating and implementing a vision for the area;
2. Members and officers working together to achieve a common purpose with clearly defined functions and roles;
3. Promoting values for Transport for the North and demonstrating the value of good governance through upholding high standards of conduct and behaviour;
4. Taking informed and transparent decisions which are subject to effective scrutiny and risk management;
5. Developing the capacity and capability of Members and officers to be effective;
6. Engaging with local people and stakeholders to ensure robust public accountability,
7. Section 102I of the Local Transport Act2008 imposes a requirement on Transport for the North, in the preparation of its Strategic Transport Plan,

to have regard to the promotion of economic growth and the social and environmental impacts of the implementation of its proposals. This includes having regard for the impact of decisions on future generations.

The table below sets out examples of how Transport for the North has met the principles set out in the CIPFA Framework and also adhered to its governance commitments set out in the Code of Governance and includes hyperlinks to sources of further information.

A Behaving with integrity, demonstrating strong commitment to ethical values and respect for the rule of law	
Core Principle	
<p>Promoting values for Transport for the North and demonstrating the value of good governance through upholding high standards of conduct and behaviour.</p> <p><i>How we met the principle</i></p> <p>Those Members of Transport for the North who are elected Members of a Local Authority are expected to adhere to the adopted Code of Conduct of their Local Authority while carrying out their duties in respect of Transport for the North. Other co-opted Members are expected to adhere to the Cabinet Office's Code of Conduct for Board Members of Public Bodies.</p> <p>Transport for the North has adopted a Code of Conduct for Officers and a Protocol on Member /Officer Relations, to which all officers are expected to adhere. Serious breaches of these Codes by officers would be investigated under the organisation's disciplinary code.</p> <p>Transport for the North's induction process for new recruits outlines the behaviours and values that are expected from officers.</p> <p>Transport for the North has a zero-tolerance approach to fraud and corruption and has adopted strong Anti-Fraud & Corruption and Whistleblowing Policies. During 2020/21 the Audit and Governance Committee reviewed the systems and controls in place to prevent fraud and corruption.</p>	<p><i>Evidence</i></p> <p>Constitution</p> <p>Code of Conduct for Officers</p> <p>Member/Officer Relations Protocol</p> <p>Human Resources On-boarding Policies</p> <p>Anti-Fraud and Corruption Policy</p> <p>Review of Anti – Fraud and Corruption Policy</p>

<p>During 2020/21 the Whistleblowing Policy was revised and a programme of training for employees is now being undertaken with the support of the charity Protect (formerly Public Concern at Work).</p> <p>Members are required to make a declaration of their disclosable pecuniary interests and also to declare any disclosable pecuniary interests in the business of the meeting at the start of all meetings of the Transport for the North Board or its Committees, and to take no part in such business, but to leave the meeting. Members Declarations of Interest are available on the Transport for the North website.</p> <p>Transport for the North has adopted a Code of Practice in relation to Gifts and Hospitality which was reviewed during 2019/20 and training on the Code was rolled out across the organisation. Guidance in relation to gifts and hospitality is included in the induction for all new employees.</p> <p>A register of Gifts and Hospitality is maintained by the Monitoring Officer, in which officers are required to declare any gifts or hospitality of more than nominal value which they have been offered, whether or not it has been accepted. An annual reminder is issued to all Employees and the Monitoring Officer reviews the register annually.</p> <p>Transport for the North has appointed a Monitoring Officer who works with Members and Officers to ensure that Transport for the North complies with its legal duties and all legal requirements. Transport for the North has an in-house legal team and the legal implications of all reports are considered and, where appropriate, legal advice provided within reports that inform decisions that are taken by Members. Legal advice is available to Members at all meetings of the Transport for the North Board and its Committees.</p> <p>The Monitoring Officer has statutory reporting responsibilities in relation to any unlawful decisions or maladministration.</p> <p>The Finance Director, as the Section 151 Officer, has responsibility for ensuring proper arrangements for financial management and has statutory reporting duties in respect of unlawful expenditure and financially imprudent decision making.</p>	<p>Whistleblowing Policy</p> <p>Constitution</p> <p>Declarations of Interest</p> <p>Code of Practice on Gifts and Hospitality</p> <p>Employees Induction</p> <p>Register of Gifts and Hospitality</p> <p>Constitution</p> <p>Board Reports</p> <p>Constitution</p>
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Transport for The North is committed to promoting Diversity and Inclusion across all areas of the business, which includes people leading the organisation and people working in it. During 20/21 Transport for the North established a cross organisational Diversity Working Group to develop a Diversity and Equalities Action Plan to ensure that respect for equality and diversity is embedded across the organisation both in employment practices and in the delivery of services and programmes.

B Ensuring openness and comprehensive stakeholder engagement

Core Principle

Engaging with local people and stakeholders to ensure robust public accountability

<i>How we met the principle</i>	<i>Evidence</i>
<p>Transport for the North's website is set out in a clear and accessible way, providing clear access to reports and minutes from Board meetings, along with updates on our core programmes and links to relevant documents. Transport for the North is also active on social media, which regularly shares links to the website where more information can be found (across several channels to widen audience), including promoting public meetings.</p> <p>All meetings of the Transport for the North Board and its formal Committees are held in public unless information which is either confidential under section 100A or exempt under Part 1 of Schedule 12A of the Local Government Act 1972 is to be disclosed. Copies of all minutes and agendas of the Board and formal Committees are available on Transport for the North's website. All reports contain details of options considered and the advice provided by officers regarding legal and financial implications. The minutes include the reasons behind the decisions made. Transport for the North has a Freedom of Information Publication Scheme in place and seeks to publish information openly on its website wherever possible and practicable to do so.</p> <p>During 2020/21 Transport for the North has held all its meetings virtually. It has continued to hold all meetings in public through live streaming the proceedings and proactively promoted this on all online channels, as well as directly to interested</p>	<p>Transportforthenorth.com website</p> <p>Board and Committee Agenda and Minutes</p> <p>Transport for the North's website</p> <p>Transport for the North website</p>

parties. All agenda and minutes continue to be available on the website.

Live streams are publicised via Transport for the North's social media platforms public attendance at meetings through watching the live stream has greatly increased during 2020/21.

Under its Regulations, Transport for the North is required to establish a Partnership Board to advise it on all matters relating to transport to, from and within its area. The Partnership Board is a forum in which the elected Members of Transport for the North engage and consult with the business leaders of the area through representatives of the eleven northern Local Enterprise Partnerships and with the national transport delivery agencies Network Rail Highways England and HS2. During 2019/20 Transport for the North reviewed the membership of the Partnership Board and widened its membership to include representatives of the Northern, North West and Yorkshire & Humber Regional TUC areas, Disability Rights UK, Transport Focus and the Committee on Climate Change. This has broadened the interests represented on the Partnership Board particularly in relation to the environment and the interests of the travelling public.

Transport for the North carries out extensive stakeholder engagement through its Engagement team and the wider organisation. Transport for the North Officers meet regularly with Parliamentarians, Members and officers of other Authorities, representatives of the Welsh and Scottish devolved governments, representatives of business organisations, and other stakeholders, such as community groups. The types of events vary from attending All Party Parliamentary Groups meetings in Parliament, including the Transport Across the North APPG for which TfN is the secretariat; to roundtable events, and speaking engagements across the North and the rest of the UK.

The Transport for the North Conference was held virtually in December 2020 and was attended by 585 delegates. The sessions covered a variety of topics relevant to Transport for the North including: Putting passengers in the North first, High Speed Rail, Decarbonisation, Economic Recovery post-Covid-19, Business Priorities, Devolution, Active Travel, and Freight and Logistics. Speakers included TfN representatives, Board Members, Government

Transport for the North
Regulations
Constitution

Memoranda of
Understanding signed
with the Welsh
Government and
Midlands Connect

Ministers, and other relevant stakeholders. Feedback received shows that 60% of delegates were very satisfied/satisfied with the event, with only 9% very dissatisfied/dissatisfied. Over 80% would attend another Transport for the North event.

Over the past 12 months, Transport for the North has facilitated six virtual webinars branded as TfNTalks, covering Strategic Rail, the Future of Roads, Northern Growth, Northern Powerhouse Rail, Integrated and Smart Travel, and Business Priorities. In addition to TfN representatives, panellists included Board Members, local and national politicians, and relevant stakeholders.

Transport for the North facilitates regular podcast episodes, which cover a large variety of topics, updates on Transport for the North's work and other salient events and issues. As with other Transport for the North events, the podcast includes TfN representatives, Board Members and other relevant stakeholders. To date, the podcasts have received a total listenership of 1,427.

Transport for the North is committed to full public engagement. Extensive public consultation was carried out prior to the adoption of the Strategic Transport Plan and public consultation is currently being planned in relation to the Decarbonisation Strategy which will be rolled out in the Spring to enable the Strategy to be adopted before the Climate Change Conference in November 2021. Transport for the North will continue with its broader engagement to raise its public profile and awareness of Transport for the North programmes.

Transport for the North has undertaken to engage fully with its Constituent Authorities and has established officer reference groups for all its major work programmes where officers from the different Local Authorities across the region have an opportunity to help formulate Transport for the North's policies and proposals at an early stage.

Transport for the North has also brought together a number of informal Members Working Groups to ensure the views of Transport for the North's constituent authorities and their communities are heard and understood via their elected representatives. This engagement has contributed to the development of Transport for the North's different programmes and initiatives, including the

Strategic Transport Plan

Decarbonisation Strategy Consultation

<p>Northern Transport Charter and in support of business planning for 2021/2.</p> <p>During 2019/20 Transport for the North developed a new monthly operating report for Members, designed to support scrutiny and challenge of its programmes and operations. This report provides qualitative and quantitative performance information in a single report. The Monthly Operating Report has continued to deliver during 2020/21 providing members and the public with detailed information about the performance of Transport for the North's major programmes.</p>	<p>Monthly Operating Report</p>
<p>C Defining outcomes in terms of sustainable economic, social, and environmental benefits</p>	
<p>Core Principle</p>	
<p>Having regard to the promotion of sustainable economic growth, and the social and environmental impacts of its proposals and having regard for the impact of current decisions and actions on future generations.</p>	
How we met the principle	Evidence
<p>The creation of sustainable economic growth is a key driver behind the Strategic Transport Plan. The initial Northern Powerhouse Independent Economic Review published in 2016 identified the persistent gap in GVA per capita and productivity performance in the North compared to the rest of the United Kingdom. The main purpose behind the establishing of Transport for the North is to achieve a rebalancing of the United Kingdom's economy through improvements to transport and connectivity between the major conurbations in the North and across the region.</p>	<p>Northern Powerhouse Independent Economic Review</p>
<p>In developing the Strategic Transport Plan (STP) we undertook a thorough evaluation of the environmental and sustainability impacts of the proposals contained in the Plan.</p>	<p>STP Evidence base</p>
<p>The STP outlined how the climate and environment will be factored in the design and development of transport interventions and plan. A "Pathway 2050" has been developed to collaborate with partners and the government to deliver the ambitions of the STP</p>	<p>Integrated Sustainability Appraisal</p>

and local transport plans in tackling carbon impacts and reductions from transport.

During 2020/21 Transport for the North has developed a Decarbonisation Strategy which it is planning to roll out for consultation during the Spring of 2021. This will adopt ambitious targets for decarbonisation across the North.

The Northern Transport Charter outlines an 'Inclusive and Sustainable North' as a key Transport for the North priority. This recognises that Transport for the North's investment programme must: contribute towards a reduction in carbon emissions; minimise the impact on the historical and natural environment; and, wherever possible, seek to deliver environmental enhancements.

Proportionate environmental and sustainability assessments will be undertaken in relation to all proposals for infrastructure developments as part of the development or appraisal of options.

Transport for the North's TAME function is also developing an Analytical Framework which consists of a series of analytical and modelling tools including NELUM (Northern Economic and Land Use Model), NoHAM (Northern Highways Assignment Model) and NorTMS (Northern Transport Modelling System). The tools contribute to the provision of evidence to support the promotion of the economic and social evidence-based analysis of Transport for the North's transformational programmes.

The Analytical Framework reflects Transport for the North's commitment to evidence-based decision making and provides a consistent evidence base to support the decision-making process on the sequencing of future interventions. This provides comfort to our Members, Constituent Authorities, and the Department for Transport that Transport for the North has fit-for-purpose decision making processes.

All reports presented to the Transport for the North Board and its formal Committees contain an assessment of the implications of the report in terms of sustainability, environmental impact and equality impacts.

Decarbonisation Strategy

The Northern Transport Charter

Transport for the North's Analytical Framework

Board Reports

The Strategic Plan and Investment Programme set out transport interventions which will benefit future generations beyond 2050.	Strategic Transport Plan and Investment Programme
D Determining the interventions necessary to optimise the achievement of the intended outcomes	
Core Principle	
Focusing on the purpose of Transport for the North and the outcomes for the community and creating and implementing a vision for the area.	
<i>How we met the principle</i>	<i>Evidence</i>
<p>The Strategic Transport Plan for the area is based on a robust evidence base and sets out our vision for transformational change in relation to transport infrastructure in the North.</p> <p>The Investment Programme sets out an ambitious programme of infrastructure projects to be delivered over the period 2019 to 2050 that will implement Transport for the North's Strategic Transport Plan. Proposed projects have been developed in collaboration with local partners and represent the best options for securing transformational change.</p> <p>Transport for the North is committed to improving the standard of service provided by the railway network in the North and, under a partnership with the Secretary of State, manages the performance of the contracted railways in the region, Northern Rail and TransPennine Express. Through rigorous monitoring of the performance of these railways, Transport for the North has held their management to account and was instrumental in bringing the Northern Rail Franchise into public control under the Operator of Last Resort.</p> <p>During the pandemic, Transport for the North was instrumental in developing the North of England Contingency Group which brought together all the main rail delivery partners to ensure that an emergency timetable was introduced to support front line workers and ensure that people could continue to make essential journeys during the pandemic lockdowns. In addition, Transport for the North has continued to use its powers and influence to shape the industry's rail investment programme in line with the Strategic Transport Plan (e.g. by</p>	<p>Strategic Transport Plan Evidence Base</p> <p>Investment Programme</p>

inputting to the Transpennine Route Upgrade and Manchester Recovery Task Force). Transport for the North has allocated resources to pioneering a new approach to journey time improvements and a programme focussed on improving reliability for passengers and freight customers.

During 2020/21, the Northern Powerhouse Rail (NPR) programme has continued to develop the strategic case for the NPR rail network to link all the major urban centres of the North by a fast-reliable rail link. During the year the NPR team has worked with partners to refine the options to enable Transport for the North to provide statutory advice to the Government on its preferred route and to enable it to submit to Government, in partnership with the DfT, a Strategic Outline Case demonstrating the benefits to the North of its proposals.

The Strategic Transport Plan for the area is based on a robust evidence base and sets out our vision for transformational change in relation to transport infrastructure in the North.

During 2020/21, the TfN Major Roads Team led work on completing qualitative sequencing of the Northern Investment Programme, identifying interventions which could be brought forward for earlier delivery and preparing for work in 2021/22 on benefits analysis of the Investment Programme.

Drawing on evidence from the qualitative sequencing, TfN completed work on an Economic Recovery Plan in July and have shared the plan and supporting evidence with the DfT's Acceleration Unit.

In December, TfN completed work on developing Future Scenarios, which are integral to the appraisal of the Investment programme and to the development of TfN's Transport Decarbonisation Strategy.

Throughout 2020/21, TfN has continued work with partners on promoting improvements to connectivity and reliability for all road users. Successes include further investment in the Major Road Network, including MRN programme entry for schemes in Cheshire East, Cumbria, York and North Yorkshire; and funding for development to OBC for schemes in

<p>Lancashire, Stockport, Transport North East, Tees Valley and Liverpool.</p> <p>2020/21 has seen significant progress with delivery of the Road Investment Strategy, with TfN engaged in Highways England work on the development of plans for scheme delivery during RIS2 and RIS3. This includes providing support for work on the A66 dualling and providing statutory advice on the Trans-Pennine Tunnel and M6-A1(M) studies.</p> <p>We completed data collection and analysis of journey time reliability, types of journey and geographical distribution of traffic using the Major Road Network (MRN) in 2019. This is the first time 24/7-year-round data has been collected across all MRN routes in the North and provides a pre-pandemic baseline.</p> <p>Throughout the year TfN has been monitoring the impact on travel patterns from restrictions resulting from the pandemic. These have had a profound impact on traffic levels and distribution of traffic on our highway network. We are sharing this data with partners and will use insights from the impact of Covid 19 to help inform future appraisal of investment proposals.</p> <p>One of Transport for the North's long-term ambitions for the North was to develop electronic ticketing across the North that could deliver the fair price promise and daily fare capping. This was being delivered through the IST Programme. Government funding cuts have meant that the current programmes have had to be curtailed. However Transport for the North retains its ambition to see contactless ticketing progressed across all modes of travel in the North and will continue to seek funding to enable this to be achieved.</p>	
E Developing the organisation's capacity, including the capacity of its leaders and the individuals within it	
Core Principle Developing the capacity and capability of members and officers to be effective	
<i>How we met the principle</i>	<i>Evidence</i>

<p>Transport for the North has adopted officer development programmes, including a thorough initial Corporate induction programme for all new officers and line managers.</p> <p>All new employees to Transport for the North are subject to a formal six-month probationary process where performance is assessed alongside the provision of initial learning and development support and guidance.</p> <p>Annual staff appraisals and half yearly reviews enable the management team to review both capacity and capability within their teams and identify any individual training and development needs. Key Performance objectives are captured in the online appraisal tool 'PERFORM' and training is delivered via the core curriculum of training.</p> <p>Role specific training needs are met through work-based learning and investment in software to enable effective outputs. Further career development is supported via the procurement of appropriate interventions to best meet individual and organisation needs.</p> <p>Where appropriate the organisation funds specialist training courses for officers and supports continuous professional development. Members of the Senior Management Team have undertaken leadership training.</p> <p>Transport for the North has incorporated Apprentices into the workforce plan at key points of entry. This is underpinned by strong relationships with Training Providers and internal support via Mentors and Line Managers. Mentors are provided with full training.</p> <p>As Transport for the North introduces new policies and procedures, training sessions are held to make officers aware of these. Information on all policies and procedures is available on the Intranet and through our Learning Management system via e-learning modules.</p> <p>Transport for the North has invested in an e-learning and development tool "Learn" and all officers are encouraged to take advantage of this.</p>	<p>Corporate Induction Guidance</p> <p>Probationary Policy</p> <p>Transport for the North Appraisal Guide</p> <p>Learning and Development Policy</p>
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<p>Employee well-being forms a core element of Transport for the North's learning and development programme with the management of mental health at the heart of this activity. In normal times well-being events are held on a quarterly basis and Mental-Health First Aiders are on hand at both our operational bases in Leeds and Manchester.</p> <p>During the pandemic, employees' welfare has been particularly important and Transport for the North has held regular wellbeing sessions for all employees addressing mental and physical health and wellbeing including physical activity sessions such as Yoga, mental health sessions such as mindfulness and nutrition and healthy eating. Employees are encouraged to support each other through daily interactions on Yammer and through virtual social events.</p>	<p>Mental-Health First Aiders Protocol</p>
<p>F Managing risks and performance through robust internal control and strong public financial management</p>	
<p>Core Principle</p>	
<p>Taking informed and transparent decisions which are subject to effective scrutiny and managing risk</p>	
How we met the principle	Evidence
<p>Transport for the North has adopted robust procedures for identifying, analysing and managing risk.</p>	<p>Risk Management Strategy (RMS)</p>
<p>To strengthen the robustness of the RMS, Transport for the North is implementing risk management software which will assist directorate and programme teams in the timely capture, escalation, and reporting risks, as set out in the RMS.</p>	<p>Risk Management System (Part of Transport for the North's Risk Management Strategy)</p>
<p>The Audit and Governance Committee is responsible for independently monitoring and assessing the adequacy and effectiveness of the risk management framework with particular focus on</p>	<p>Constitution Governance Framework</p>
<ul style="list-style-type: none"> (i) the risk management strategy for managing key risks; (ii) risk ownership, accountability, and the development of mitigating actions; 	

<p>(iii) the alignment of internal audit and other assurance planning through a risk-based approach to auditing; and</p> <p>(iv) receiving reports from management on the adequacy and effectiveness of the internal control and risk management framework.</p> <p>Transport for the North has a Risk Manager who is responsible for reporting on risk to the Finance Director who reports to the Audit and Governance Committee. The organisation has adopted a robust process for identifying, assessing, and mitigating risks and these are reported regularly to the internal Operations Board of Directors, to the Executive Board and to the Audit and Governance Committee. A risk report is also included in the Monthly Operating Report. In accordance with the Constitution, the Finance Director is responsible for the presentation of Corporate Risks to the Transport for the North Board.</p> <p>Project management systems are in place for all programmes and programme Directors report regularly on performance to Programme Boards and to the Transport for the North Board.</p> <p>Transport for the North has put in place a strong system of financial governance to manage and control its financial affairs. The Finance Director has overall responsibility for ensuring the effectiveness of internal controls. The Finance Director is supported by the Finance Controller who has day to day responsibility for ensuring adherence to the adopted processes and procedures. Transport for the North has adopted rigorous procurement approval procedures which ensure that all procurements comply with its contract procurement rules.</p> <p>Robust people management policies and procedures have also been adopted and embedded within Transport for the North in relation to code of conduct, recruitment and selection, probationary management, performance management, conduct and capability and absence management. This framework of policies and procedures for managing individual performance, conduct, capability, and attendance at work.</p>	<p>Reports to Audit and Governance Committee and Transport for the North Board</p> <p>Contract Procedure Rules</p> <p>Recruitment & Selection, Probationary, Absence & Welfare, Performance Improvement, Disciplinary, Code of Conduct Policies</p>
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G Implementing good practices in transparency, reporting and audit to deliver effective accountability	
Core Principle	
How we met the principle	Evidence
<p>Taking informed and transparent decisions which are subject to effective scrutiny and managing risk</p>	
<p>Transport for the North considers the available evidence when making decisions. Transport for the North commissions extensive research for all its programmes and explores different options before prioritising proposals.</p> <p>The Strategic Transport Plan is based on a robust evidence base and was subject to a 13-week statutory consultation exercise during which officers and Members considered in detail the representations made by members of the public and stakeholders. The Strategic Plan is available for public inspection on the website.</p> <p>Transport for the North has established a Scrutiny Committee made up of elected representatives from the 20 Constituent Authorities. The Board made a decision at its inaugural meeting to adopt a "Scrutiny First" model and so all major decisions are subject to scrutiny before they are presented to the Board. The Scrutiny Committee therefore has an opportunity to influence the Board's decisions before they are made, rather than reviewing decisions after they have been taken.</p> <p>The Committee meets regularly and is supported by Transport for the North officers. It subjects proposals to scrutiny before they are presented to the Transport for the North Board, with the recommendations of the Scrutiny Committee being included in the officer's final report to the Board.</p> <p>All policies and proposals developed by Transport for the North are considered first at Officer Reference Groups, made up of officers from all the Constituent Authorities, and then by the internal Operating Board of Transport for the North Directors. Policies and proposals are then further considered by the Executive Board comprising the Chief Executives (or their nominees) of all the Constituent Authorities,</p>	<p>STP and Evidence base</p> <p>Constitution</p>

<p>before being reported to the Transport for the North Board.</p>	
<p>All major work programmes also have Programme Boards, which are attended by representatives of the DfT, where the progress of these programmes is regularly reviewed against agreed milestones and where major decisions are discussed.</p>	
<p>The Northern Powerhouse Rail project is co-cliented with the DfT and a Memorandum of Understanding with the DfT was approved by the Transport for the North Board on the 12th March 2020 setting out governance arrangements including regular reporting of finances, performance, and risk to a Programme Board.</p>	<p>Constitution</p>
<p>Transport for the North operates under Memorandum of Understanding with the Secretary of State for Transport and Officers of Transport for the North meet with representatives of DfT at regular Sponsorship Meetings.</p>	<p>Memorandum of Understanding with the Secretary of State</p>
<p>During 2020/21 Transport for the North has produced monthly monitoring reports that bring together performance and financial information to provide greater transparency in relation to ongoing operations. This report is published on TfN's website and provides to all members of the Transport for the North Board, the Scrutiny Committee and the Audit and Governance Committee with the information they need to challenge Transport for the North's performance.</p>	<p>Monthly Operating Report</p>
<p>The Rail North Partnership Team reports regularly to the Rail North Committee, and is accountable to the Rail North Partnership Board which is made up of officers of the Constituent Authorities and the DfT where decisions in relation to the management of the performance of the contracted railways are made.</p>	<p>Rail North Partnership Board</p>
<p>Transport for the North has adopted robust procedures for identifying, analysing and managing risk. The risks are presented for discussion to Transport for the North's Operating Board, Audit and Governance Committee, DfT, and Transport for the North Board.</p>	<p>Programme and Corporate Risk Reports</p>
<p>Transport for the North has an Audit and Governance Committee which is responsible for</p>	<p>Constitution</p>

<p>independently monitoring and assessing the adequacy and effectiveness of the risk management framework.</p> <p>The Audit and Governance Committee receives a risk report at every meeting and the Committee selects key risks which it wishes to explore in greater detail.</p> <p>The Audit and Governance Committee includes three Independent Members appointed after a public recruitment exercise to provide an independent focus and additional expertise to support the Committee in its role.</p> <p>The Finance Director is responsible for the internal audit function. This has been contracted out to RSM which operates within an Annual Audit Plan that is approved by the Audit & Governance Committee. RSM attends each committee meeting and reports on progress against the Audit Plan.</p> <p>Mazars were appointed as Transport for the North's external Auditors via the PSAA. The firm attends every meeting of the Audit & Governance Committee where it provides updates on progress throughout the year and can gain in-depth insights into the workings of Transport for the North.</p> <p>In line with best practice, Transport for the North publishes financial transparency reports each quarter, detailing all individual items of expenditure greater than £500 and all procurement card spend.</p> <p>Organisational organograms and salary information is also made available for public consumption on the external website.</p>	<p>Corporate Governance Framework</p> <p>Constitution</p> <p>Reports to Audit and Governance Committee and Transport for the North Board</p> <p>Annual Audit Plan</p> <p>Transparency Reports</p>
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Annual Review of the Effectiveness of the Governance Framework

The effectiveness of key elements of the governance framework are assessed throughout the year by the Chief Executive and Directors meeting as the Operations Board (OBT), by internal audit and by the Audit and Governance Committee. Performance in relation to key risks is reported to (OBT) on a monthly basis and regularly to the Audit and Governance Committee and also to the Transport for the North Board. Significant risks and performance in relation to key programmes is also reported to the Executive Board of Senior Officers of the Constituent Authorities at a monthly meeting.

Governance Challenges identified in 2019/20 for 2020/21 and beyond

Subject	Action	Progress	Target Completion Date
Review of the Constitution	To review the Constitution to bring in changes flowing from the Blake-Jones Review and the wider Members' review of the role of Transport for the North	The review was postponed to await the publication of the findings of the Williams Review	Held in abeyance
Adoption of the Assurance Framework	Implement and embed the Assurance Framework in Transport for the North decision-making processes	Further development of the decision-making process has been held in abeyance pending the anticipated White Paper on devolution	Held in abeyance
Board Reporting	Embed and refine the Monthly Operating Report to ensure alignment of quantitative and qualitative reporting.	Monthly Operating Reports produced and circulated to Members on an ongoing basis	Completed
Virtual Meetings in response to the Covid 19 Pandemic	Enable remote attendance by both Members and the public at meetings of the Transport for the North Board other Committees	Virtual Meetings established for all Boards and Committees and Virtual Meetings Procedure Rules adopted	Completed

Governance Challenges identified for 2021/22 and beyond

Subject	Responsible	Target Date
Appointment of new Chief Executive	Dawn Madin	01/06/2021
Review of TfN Boards and Committees with particular reference to the General Purposes Committee	Julie Openshaw	01/07/2021
Review of Scrutiny function and in particular the policy of "Scrutiny first"	Julie Openshaw	31/03/2022

Conclusion

The governance arrangements as described above have been applied throughout this year and up to the date of the Annual Accounts providing an effective framework for identifying governance issues and taking mitigating action. Over the coming year Transport for the North will continue the operation of the governance framework and take steps to carry out the actions for improvement identified in the review of effectiveness to further strengthen its governance arrangements.

Signed

Chair of the Transport for the North Board

Signed.....

Chief Executive

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Transport for the North Constitution

Terms of Reference of the Scrutiny Committee

20 Scrutiny Committee

20.1 The Order of the Secretary of State made on the 22nd January 2018 contains provisions relating to Scrutiny of the decisions of Transport for the North. These Arrangements reflect those provisions.

20.2 The Scrutiny Arrangements will be reviewed annually to ensure that they remain effective.

20.3 References in these Arrangements to major and strategic decisions of Transport for the North taken in accordance with the delegations set out in Part 3 of this Constitution include major and strategic decisions taken by Committees and sub-committees of Transport for the North in accordance with such delegations.

Objectives of Scrutiny

20.4 These arrangements have been established to act as a focus for the scrutiny and challenge of Transport for the North, and for investigating matters of strategic importance to residents, those travelling within the combined administrative area covered by the Constituent Authorities and other stakeholders. The role of these arrangements will include:

- a) reviewing the decisions of the Transport for the North Board;
- b) reviewing the decisions of Transport for the North which are taken in accordance with the delegations set out in Parts 3 and 4 of this Constitution;
- c) making reports or recommendations to the Transport for the North Board with respect to the discharge of its functions;
- d) making reports and recommendations to the Transport for the North Board on matters relating to transport to, from or within Transport for the North's area;
- e) making recommendations to the Transport for the North Board in advance of any decisions that Transport for the North Board proposes to take.

Operation of Scrutiny Arrangements

20.5 Each of the Constituent Authorities shall be entitled to appoint one Member and one Substitute Member to the Scrutiny Committee. Appointees to the Scrutiny Committee must be a member of the appointing Constituent Authority or in the case of a Combined Authority, one of the Constituent Authorities of the Combined Authority but may not be Members of the Transport for the North Board or the Rail North Committee (including substitute and co-opted members). The term of office for members of the Scrutiny Committee will be one year from the date of the annual council meeting of the Constituent Authority that appoints them to the Scrutiny Committee unless:

- a) They cease to be an elected member of the Constituent Authority that appointed them;
- b) They wish to no longer participate in these arrangements; or

c) The Monitoring Officer to Transport for the North is advised by any of the Constituent Authorities that it wishes to change one or more of its appointees to the Scrutiny Committee.

20.6 Any person may be co-opted as a Co-opted Scrutiny Member to participate in these arrangements from all or any of the associated authorities or from such other organisations as Transport for the North may decide. Unless Transport for the North decides otherwise, such Co-opted Scrutiny Members shall be non-voting members.

Meetings of Scrutiny Committee

20.7 The members appointed to the Scrutiny Committee under Clause 20.5 above will hold at least one annual meeting and may convene additional joint meetings in accordance with these arrangements.

20.8 At the annual meeting, the Scrutiny Committee members will:

- a) Appoint a Chair and two Vice Chairs;
- b) Determine the areas of review and scrutiny that they wish to pursue during the ensuing 12 months;
- c) Agree to establish Scrutiny Panels from amongst their number in order to carry out reviews;
- d) Agree to carry out agreed areas of review and scrutiny.

20.9 The quorum for the annual meeting and any other meetings held under Clause 20.7 will be five and must include representatives of at least five of the Constituent Authorities.

20.10 The principle of decision making at any such joint meeting shall be that, wherever possible decisions will be made by agreement, without the need for a vote. If a vote is necessary, it will be decided by a simple majority of those present. The provisions relating to weighted votes set out in Clause 6 and appendix 2 shall not apply to the Scrutiny Committee or to Scrutiny Panels.

20.11 The venue for each annual meeting and any other Scrutiny Committee meetings held under this Clause 4 will be decided by Transport for the North as part of the approved Calendar of Meetings and shall be notified to Constituent Authorities for inclusion on their Council web sites.

20.12 Notice of the annual meeting and any other Scrutiny Committee meetings held under Clause 20.7 will be sent to each Scrutiny Committee member in accordance with the requirements of the Local Government Act 1972. For Members who are Members of one of the Constituent Authorities Notice will be sent to the principal place of business of that Authority. Members agree to receive notice of all meetings by e-mail.

20.13 The Chair will approve the agenda for each annual meeting and any other Scrutiny Committee meetings held under Clause 20.7; however, any member of the Scrutiny Committee will be entitled to require an item to be placed on the agenda for the meeting.

20.14 Different approaches to scrutiny reviews may be taken in each case but members will seek to act in an inclusive manner and will take evidence from a wide range of opinion. In particular, the Chair will consider requests from members of the public to speak at meetings of the Committee provided the request has been made in writing to the Monitoring Officer not less than 48 hours

before the date of the meeting. Members of the public, if allowed to speak, shall be allowed up to 3 minutes to address the Committee.

20.15 Each Scrutiny Panel established under paragraph 20.25 shall determine its own calendar of meetings and the venue for each meeting.

20.16 Subject to paragraphs 20.8 – 20.14, meetings will proceed in accordance with the Rules of Procedure set out at Part 5 of the Constitution.

Powers of the Scrutiny Committee

20.17 The Scrutiny Committee has the power to:

- a) To review and scrutinise decisions made, or other action taken by Transport for the North;
- b) To make reports or recommendations with respect to the discharge of the functions of Transport for the North;
- c) To make reports or recommendations on transport matters that affect the area of Transport for the North or inhabitants of the area or other stakeholders;
- d) To require members or officers of Transport for the North to attend meetings of the Committee to answer questions;
- e) To invite other persons to attend meetings of the Committee.

Key principles for the operation of the scrutiny arrangements

20.18 Transport for the North and the Constituent Authorities will work together to maximise the exchange of information and views, to minimize bureaucracy and make best use of the time of members and officers of other bodies or agencies.

20.19 Members of the Scrutiny Committee will, when considering reviews, determine whether the issue is more appropriately dealt with by one of the Constituent Authorities or elsewhere and will not duplicate the work of existing bodies or agencies.

20.20 Subject to prior consultation, Transport for the North will respond positively to requests for information, or for the attendance of a member or officer at any meetings set up under these arrangements.

20.21 While it is ultimately for Transport for the North to decide who it considers the most appropriate person(s) to speak on its behalf at any meetings set up under these arrangements, consideration will be given to meeting specific requests.

20.22 Dates and times for officer and member attendance at any meetings set up under these arrangements should be by agreement.

20.23 Members appointed under these arrangements may require the attendance of officers employed by Transport for the North to answer questions and give evidence at any meetings set up under these arrangements. All such requests must be made via the Monitoring Officer of Transport for the North. If any request is declined by the Monitoring Officer, he/she must state the reasons for so doing.

20.24 When considering any matter in respect of which a Scrutiny Committee member appointed under these arrangements is subject to a party whip the member must declare the existence of the whip and the nature of it before the commencement of any deliberations on the matter. The declaration, and the detail of the whipping arrangements, shall be recorded in the minutes of the meeting.

Scrutiny Panels

20.25 The annual meeting of members of the Scrutiny Committee will establish Scrutiny Panels to undertake agreed scrutiny reviews.

20.26 Membership of the Scrutiny Panels will be determined at the annual meeting.

20.27 Scrutiny Panels established by Clause 20.25 shall include representatives from at least 5 of the Constituent Authorities. Each Scrutiny Panel shall appoint a Chair and Vice Chair from amongst its members.

20.28 Scrutiny Panels established under Clause 20.25 must be appointed to carry out specific scrutiny tasks and be time limited. Their continuation will be subject to confirmation at each annual meeting of the Scrutiny Committee.

20.29 Transport for the North may also, if it chooses, request that a Scrutiny Panel drawn from amongst members appointed to the Scrutiny Committee be appointed to examine a specific issue in more detail and report back its findings to Transport for the North.

Reviews and Recommendations

20.30 The process of scrutiny will be an open and transparent process designed to engage the Constituent Authorities, their residents and other stakeholders.

20.31 Meetings will be held in public unless the meeting decides to convene in private to discuss confidential or exempt information, in accordance with the relevant provisions of the Local Government Act 1972.

20.32 The terms of reference, timescale and outline of any review will be agreed by the Scrutiny Committee at their annual meeting.

20.33 Different approaches to scrutiny reviews may be taken in each case but members will seek to act in an inclusive manner and will take evidence from a wide range of opinion.

20.34 The primary objective of any Scrutiny Panel established under these arrangements will be to reach consensus on its recommendations, but where a minimum number of two members express an alternative to the majority view, they will be permitted to produce a minority report.

20.35 Voting if needed will be by a show of hands and a simple majority will be required to approve any recommendation.

20.36 A completed Scrutiny Review shall be forwarded to Transport for the North for consideration. Transport for the North shall consider the findings of a Scrutiny Review at the next available meeting and the decision of Transport for the North on the findings of a Scrutiny Review will be reported back to the next available meeting of the Scrutiny Committee.

Budget and Administration

20.37 The Scrutiny Budget will be agreed as part of Transport for the North's annual budgetary processes.

20.38 The budget will be required to meet all officer support to the scrutiny arrangements, including research support.

20.39 The decisions and recommendations of any Scrutiny Panels set up under these arrangements will be communicated to the Transport for the North Board, and other Scrutiny Committee members as soon as possible after resolution by those appointed to any such Scrutiny Panel.

20.40 Any external expenditure shall be procured and managed through and in accordance with Transport for the North's adopted financial processes.

Support and advice to scrutiny arrangements

20.41 Members appointed to any Scrutiny Panel under these arrangements may ask individuals or groups to assist it on a review by review basis and may ask independent professionals for advice during the course of reviews. Such individuals or groups will not be members of the Scrutiny Panel and will not be able to vote.

20.42 Members appointed to any Scrutiny Panel under these arrangements may invite any other person to attend their meetings to answer questions or give evidence; however, attendance by such persons cannot be mandatory.

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Subject: TfN Decarbonisation Strategy

Author: Peter Cole, Principal Environmental and Sustainability Officer

Sponsor: Tim Foster, Interim Strategy and Programme Director

Meeting Date: Thursday 15th March 2021

1. Purpose of the Report:

- 1.1 This report presents the draft TfN Decarbonisation Strategy and the recommendation made to TfN Board for a regional Decarbonisation Trajectory.
- 1.2 The Committee is asked for comments or questions on both TfN's approach to the Decarbonisation Strategy and TfN's approach to defining a Decarbonisation Trajectory.
- 1.3 Agreement of the Strategy and proposed Decarbonisation Trajectory was sought from TfN Board and achieved during the March 2021 Board meeting.
- 1.4 Agreement was also gained from the Board for TfN to now finalise the design of the document and make preparations for a public consultation on the Strategy, proposed for Summer

2. Executive Summary:

- 2.1 Building on the commitment to develop a decarbonisation pathway to 2050, TfN has prepared a Decarbonisation Strategy for agreement, consultation and publication during 2021.
- 2.2 The Strategy illustrates existing emissions from surface transport in the North, a number of future plausible emissions scenarios and a regional Decarbonisation Trajectory. The strategy document then presents a policy analysis to understand the strength of policy commitment needed and the types and mix of measures that could be used for the region to bridge the policy gap.
- 2.3 The proposed regional Decarbonisation Trajectory, against which TfN can benchmark its projects and programmes, reflects recent carbon budget analysis by the Tyndall Centre for Climate Change Research. It proposes a 95% reduction in emissions from surface transport in the North by 2040, and a close to zero emissions date of 2045.
- 2.4 The Strategy document also includes chapters on embodied carbon and climate change resilience and adaptation, as well as identifying a

number of activities that TfN proposes to undertake in the short term, up to 2025. As part of the latter, we have undertaken a high-level review of the key opportunities for TfN to support clean growth opportunities and LEP strategies in the North, in relation to the decarbonisation of our transport system.

- 2.5 Engagement with Partner officers, industry, academia (in particular the Decarbon8 network) and other Sub National Transport Bodies, has been instrumental in the development of the Strategy.
- 2.6 The Board agreed the Strategy and the proposed Decarbonisation Trajectory, incorporating a close to zero date of 2045, and for TfN to now finalise the design of the document and commence preparations for a public consultation during the summer of 2021.
- 2.7 A full version of the Strategy document is included within Appendix 1 for information. Please note that the document is an undesigned version and as such, some Tracked Changes and Comments have been retained to signpost where design elements need to be implemented within the document.
- 2.8 Appendix 2 includes a 'designed-up' version of a previous draft of Chapters 1 to 3. The content is illustrative and is included solely to allow partners a preview of the design style proposed for the document.

3. Consideration:

- 3.1 TfN's Strategic Transport Plan committed to the development of a 'Decarbonisation Pathway to 2050' so that a zero-carbon transport network is at the heart of public policy making and future investment decisions in the North. The Strategy was subsequently prepared by TfN officers for agreement with members at the TfN Board.
- 3.2 A key element of the strategy will be an agreed end date for the whole of the North to achieve net zero emissions on surface transport. The Board had previously agreed that this should be earlier than the government's stated date of 2050.

Developing the Strategy

- 3.3 The Decarbonisation Strategy builds on the Strategic Transport Plan commitments with a holistic, pan-Northern approach to achieving net zero. Our development work has helped us define and prioritise the key areas for focus, and engagement with Partners, Decarbon8 and other STBs. The strategy is based on the following key elements.
- 3.4 Firstly, the strategy introduces TfN's Decarbonisation Trajectory, defining:

- what is included within the trajectory the rationale for the agreed end date and how TfN intends to use the trajectory.
 - An illustration and breakdown of the region's current emissions from surface transport, and an introduction to TfN's Future Travel Scenarios. These have been combined to provide a series of plausible future baseline emission scenarios.
- 3.5 Secondly the strategy defines the 'policy gap' between each future scenario and TfN's agreed Decarbonisation Trajectory, including:
- Which existing policy commitments will need to be strengthened at both a national and local level to bridge the policy gap between a number of our plausible future travel scenarios and our required trajectory.
 - What combination of new policy measures, at both a local and national level, will be needed to achieve the demand and vehicle emissions intensity objectives defined within our decarbonisation pathway under each future travel scenario.
- 3.6 Within the policy section, we also consider a number of other important elements:
- The potential co-benefits and also unintended adverse consequences associated with the main transport decarbonisation policy levers.
 - TfN's approach to embodied carbon and how it will be considered within our decision making at both a strategic level and at a project level.
 - Climate change adaptation, resilience and the consideration of the impacts of climate change within our business case development including a light touch review of relevant national and local guidance.
- 3.7 Finally, the decarbonisation strategy draws together the proposed priority actions for TfN to undertake in the next few years. TfN will focus on those actions best taken at a pan-northern level that will help our Partners along their decarbonisation journey through the provision of evidence, data and implementation strategies.
- 3.8 Alongside the agreed actions for TfN, will be a number of indicators to be incorporated into TfN's evolving Monitoring and Evaluation Framework, through which we can measure:
- The regions progress in terms of decarbonisation of surface transport.

- The success of specific measures and actions committed to within the Decarbonisation Strategy.
- 3.9 A full, but undesigned, version of the Strategy document is included as Appendix 1 to this report.

Consideration of Clean Growth Opportunities within the North

- 3.10 An area of focus during the development of the Strategy was to understand compatibility of the main decarbonisation policy areas with LEP strategic plans, including Local Industrial Strategies.
- 3.11 As part of this process we also carried out an initial high-level review of clean growth opportunities in the North, identifying the key areas and ways in which TfN can best support those opportunities.
- 3.12 It is important that our Decarbonisation Strategy is cognisant of, and where possible supports, the wide range of clean growth initiatives and opportunities that already exist in the North.

Engagement

- 3.13 Engagement with Partners, industry, other STBs and DecarboN8 have been essential in terms of shaping the Strategy, and in particular the subsequent priority actions for TfN, being developed currently. A workshop was held with Partner officers in late November to help define these actions.
- 3.14 TfN has also engaged actively with those Partners who are currently developing their own place-based trajectories and policy measures to ensure that proposed actions are complementary and to understand how best TfN can support those Partners in achieving their objectives.
- 3.15 The DecarboN8 network has also played an important role in helping us to define TfN's role in terms of decarbonisation, peer reviewing our evidence base and progressing early research in several areas.
- 3.16 In addition, the contents and intent of the Strategy has been informed by the substantive discussion, with Partner officers and elected members, that helped shape TfN's response to DfT's Transport Decarbonisation: Setting the Challenge consultation.

Defining the Trajectory

- 3.17 This paper presents a high-level consideration of two potential decarbonisation trajectory options to Partners, both of which achieve close to zero surface transport emissions by 2050 or before. One option was recommended for agreement by TfN Board.
- 3.18 Local Authorities across the North have adopted whole economy net zero targets ranging from 2030 to 2050, with some authorities yet to

develop or adopt targets. The ‘starting point’ for decarbonisation for different places in the North in terms of per capita emissions from transport, is similarly varied.

- 3.19 The adopted targets, costs of action, mix of solutions and pace of change in relation to the decarbonisation of transport will show significant variance between different places. A regional trajectory needs to reflect this variation and ensure it supports all our Partners.
- 3.20 The different high-level trajectory options considered in forming our recommendation included:
 - Option 1 achieves a close to zero date by 2050 and assumes a Climate Change Committee consistent trajectory.
 - Option 2, the more ambitious trajectory, achieves an approximate 95% reduction by 2040 and a close to zero date of 2045. It reflects recent carbon budget analysis by the Tyndall Centre for Climate Change Research.
- 3.21 The Northern Transport Charter defines the requirement for a ‘close to zero’ emissions date, earlier than 2050. We asked the Board to agree to our recommendation of adopting a trajectory for surface transport emissions, in line with **Option 2**. This would effectively mean that all areas of the North would need to have managed to reduce their emissions to close to zero by **2045**.
- 3.22 We believe that Option 2 reflects an appropriate level of ambition whilst also being inclusive of all our Partners across the North and mindful of the varying pace of change which each can achieve.
- 3.23 It is expected that different places will have different decarbonisation trajectories and that these would be accommodated within the Northern trajectory. For example, it would be possible to reflect earlier dates (e.g. 2038) set locally in some largely urban areas.
- 3.24 Our Decarbonisation Trajectory and pathways analysis will:
 - Act as a benchmark for TfN’s projects and programmes, allowing us to make more informed and better decisions.
 - Allow us to form evidenced based policy positions, particularly in terms of the level of national support needed.
 - Allow us to account for longer distance journeys (that typically may be considered ‘through traffic’ at smaller spatial governance scales).
 - Enables us a better understanding of how best we can support Partners in achieving their own ambitions – through focussing our research, evidence gathering and lobbying.

Next Steps

- 3.25 Having gained the Board's agreement of the Strategy, TfN will complete the design of the document during April 2021. In parallel, we shall commence production of public consultation materials.
- 3.26 TfN proposes to launch a public consultation on the Strategy in late May/early June 2021, to run for 12 weeks.
- 3.27 Another key consideration for next steps, is the expected publication of Government's Transport Decarbonisation Plan (TDP), now due in Spring 2021. Once this is published, we will review our trajectory and pathway in light of any new/changed recommendations or assumptions.
- 3.28 We will ensure that members and partner officers have the opportunity to review consultation materials in advance of the public consultation. This version would also incorporate any late changes as a result of late publication of the governments TDP.
- 3.29 Following the public consultation, we would expect to bring the final Strategy to a Board meeting in the autumn of 2021 for formal adoption.

4. Discussion points for Scrutiny Committee

- 4.1 This paper sets out the structure and content of our Decarbonisation Strategy and provides the rationale for a recommended regional provisional Decarbonisation Trajectory, with a close to zero date of 2045.
- 4.2 The final Decarbonisation Strategy, incorporating TfN's Decarbonisation Trajectory, as included in Appendix 1, is presented to the Committee for comments and questions.

5. Appendices:

- 5.1 Appendix 1 – TfN Decarbonisation Strategy document (undesigned).
- 5.2 Appendix 2 – Proposed design style (illustrative).

List of Background Documents:

There are no background papers to this report.

Equalities:

Age	Yes	No
Disability	Yes	No
Gender Reassignment	Yes	No
Pregnancy and Maternity	Yes	No
Race	Yes	No
Religion or Belief	Yes	No
Sex	Yes	No
Sexual Orientation	Yes	No

Consideration	Comment	Responsible Officer	Director
Equalities	A full Impact assessment has not been carried out because the report concerns the preparation of a Strategy, rather than endorsement of a final Strategy document. Note that the Strategy will include a commitment for further action in relation to avoiding Transport Related Social Exclusion as a result of transport decarbonisation policies.	Peter Cole	Tim Foster

Environment and Sustainability

Yes	No
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Consideration	Comment	Responsible Officer	Director
Sustainability / Environment – including considerations regarding Active	A full impact assessment has not been carried out because the report is not concerned with a subject that requires	Peter Cole	Tim Foster

Travel and Wellbeing	development consent (thus EIA is not required), and the Strategy is not likely to lead to any significant adverse effects not anticipated by the Strategic Transport Plan and the SEA that accompanied it.		
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Legal

Yes	No
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Consideration	Comment	Responsible Officer	Director
Legal	There are no obvious legal implications other than any addressed within the report.		

Finance

Yes	No
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Consideration	Comment	Responsible Officer	Director
Finance	The activities required to progress the strategy in 2021/22 are captured in the relevant business areas.	Paul Kelly	Iain Craven

Resource

Yes	No
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Consideration	Comment	Responsible Officer	Director
Resource	The HR Team has confirmed there are no direct resourcing implications as result of this update.	Head of HR	Director of Business Capabilities

Risk

Yes	No
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Consideration	Comment	Responsible Officer	Director
Risk	For the purpose of this paper, a risk assessment is not required. However, risks relating to decarbonisation can be found in the Corporate Risk Register.	Haddy Njie	Iain Craven

Consultation

Yes	No
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Consideration	Comment	Responsible Officer	Director
Consultation	Either A suitable consultation has been carried and the results [show <i>[to be completed by the report author]</i>] [are included in the report].		
Consultation	A consultation has not been carried out but is scheduled to be undertaken during the summer of 2021 following sign off of the Consultation Version by TfN Board.	Peter Cole	Tim Foster

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Decarbonisation Strategy – March TfN Board

Transport for the North

Contents

Chapter 1	Introduction
Chapter 2	TfN's Decarbonisation Trajectory
Chapter 3	Estimating current and future emissions
Chapter 4	Decarbonisation Pathways
Chapter 5	Policy analysis
Chapter 6	Consideration of embodied carbon
Chapter 7	Climate change adaptation and resilience
Chapter 8	Stimulating Clean Growth in the North
Chapter 9	TfN's priority actions to 2025
Chapter 10	Internal assurance, monitoring and evaluation
Annex A	Detailed Policy Recommendations
Appendix 1	Decarbonisation Modelling Methodology

Acknowledgements

This Strategy document has been informed by policy analysis support provided by Element Energy and Systra, as well as research undertaken on behalf of TfN by Arcadis, into opportunities to aid clean growth in the North.

We would also like to extend our thanks to the DecarboN8 network and in particular Professor Greg Marsden of the Institute of Transport Studies at the University of Leeds for his general advice and his review of both the Strategy document and TfN's No-Carb tool.

Chapter 1 - Introduction

The science is conclusive - the world is facing a climate emergency.

In the UK, transport is the largest contributing sector to greenhouse gas emissions, accounting for 22% of all emissions in 2019¹, of which more than 95% are from road transport. Furthermore, transport emissions have actually grown overall since 2013, despite modest falls in the last few years².

Whilst it is possible that 2020 figures will show a drop in emissions due to reduced levels of travel during the COVID-19 lockdown, this is likely to be temporary, with demand for car travel rebounding more quickly than public transport, approaching pre-pandemic levels.

In our Strategic Transport Plan, published in 2019, Transport for the North (TfN) committed to scoping, developing and implementing a 'Pathway to 2050' in line with the then UK law of achieving an 80% reduction in national emissions by 2050 (now superseded by the current UK Government

¹ This relates to surface transport and does not include emissions from aviation and shipping.

² <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019>

commitment to achieve net zero emissions by 2050). For the surface transport sector, this meant that road transport emissions would need to be near-zero and rail would need to be decarbonised by 2050.

TfN and our partners believe that an acceleration towards a zero-carbon transport network must be at the heart of public policy making and investment decisions. Our ambition for the North is to travel faster and further than national policy and maximise the clean growth opportunities that decarbonisation can provide for the North. Through this Decarbonisation Strategy, TfN and our partners are committing to a regional near-zero carbon surface transport network by 2045.

The achievement of TfN's vision of a thriving North of England, where world class transport supports sustainable economic growth, excellent quality of life and improved opportunities for all, is contingent on how we can reduce our greenhouse gas emissions across everything that we do, and then, making the right decisions at the right time.

The Role of TfN

Through its statutory powers, TfN acts as 'one voice' for the North, communicating pan-Northern priorities to the Secretary of State for Transport. We have a clear remit to identify the transport infrastructure required to support transformational economic growth in the North, and to prioritise that investment. This places TfN and partners in a strategic position to identify the transport infrastructure and policy measures that are required to achieve the North's decarbonisation ambitions.

When prioritising transport infrastructure delivery in the region, TfN must make decisions based on a knowledge of how those projects and programmes are likely to support or challenge the region's decarbonisation objectives. This Decarbonisation Strategy provides a tool to robustly consider how our Investment Programme is performing in this respect. It will also provide guidance to support an appropriate sequencing of those investments and the mitigation actions that may be needed to deliver transformational economic growth in line with decarbonisation ambitions.

While most of the responsibility for policy implementation lies with national and local government, TfN operates at a geographical and institutional level that allows us to facilitate a regional approach to decarbonisation measures and research, for example, developing a pan-regional electric vehicle charging infrastructure framework. Indeed, a high proportion of the emissions from private road vehicles is generated by longer distance regional-level trips, with our analysis indicating that around 60% of road transport emissions in the North originate from trips on the Major Road Network. This means TfN has both an opportunity and a responsibility to help reduce this significant share of road transport emissions.

TfN is also uniquely placed to assist our partners in the development of place-based solutions by analysing emissions at a more disaggregate level and providing enhanced evidence, data platforms and intelligence to inform bespoke local and regional strategies. This can in turn support national policies to take account of spatial and social variation.

At a project level, TfN has a responsibility to ensure that the design and construction of our projects and programmes reduce lifecycle carbon and to encourage partners to adopt similarly ambitious policies.

The North is also extremely well placed to support the testing and trialling of many emerging technologies that will be crucial to transport decarbonisation in the UK, including through existing initiatives such as the UK's first Hydrogen Transport Hub in the Tees Valley, Zero Carbon Humber and HyNet North West. Through partnerships and co-working with Local Authorities, Local Enterprise Partnerships, transport providers and regional academic and industry players, TfN is committed to promoting the North as hub for innovation, research and the testing of emerging technologies.

(STP INNOVATION DIAGRAM HERE)

Finally, TfN needs to lead by example. Whilst the focus of this strategy is upon understanding, measuring and reducing the emissions from surface transport in the North and the construction and operation of the proposed schemes within our Investment Programme; it is important that we look to reduce the emissions resulting from TfN directly as a result of our everyday business. These are called our 'organisational emissions'.

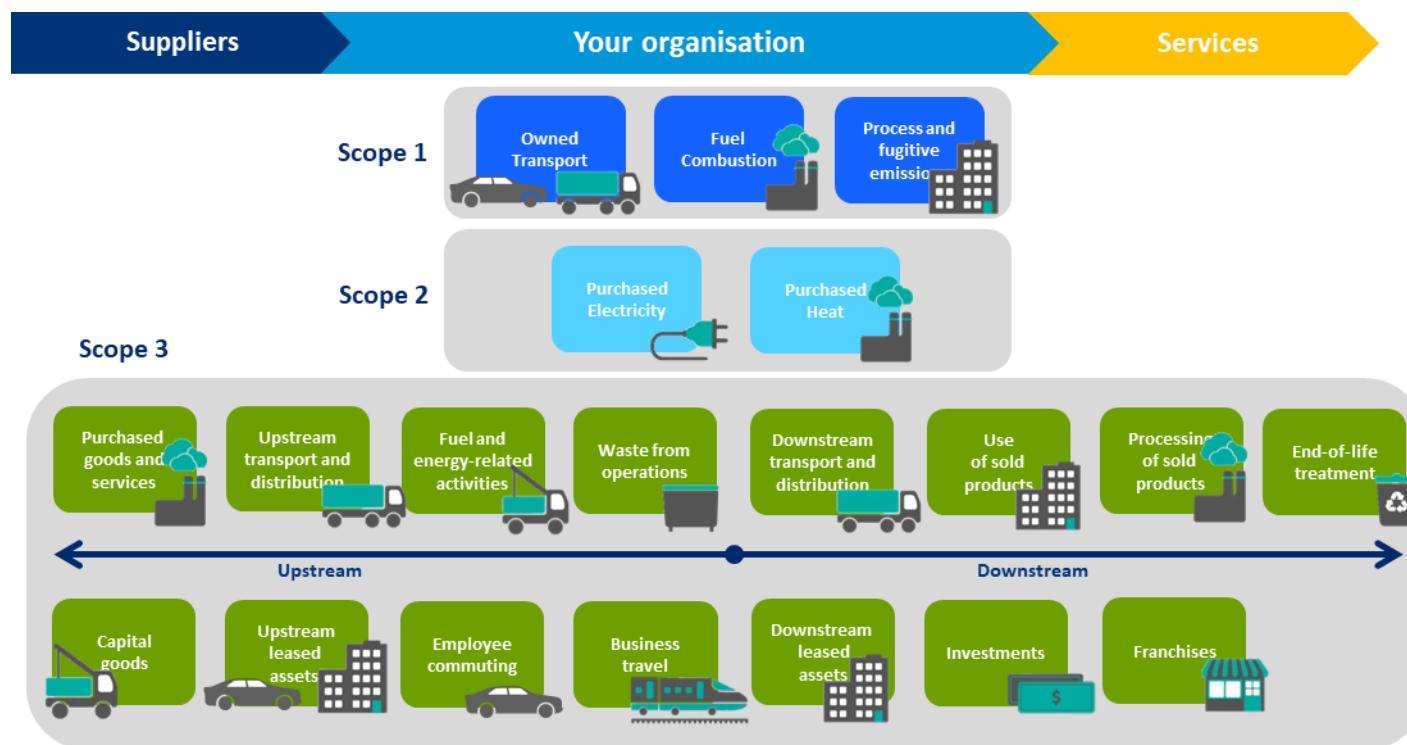


Figure XXX, Carbon Footprinting – Organisational Boundaries³

The full range of activities and goods, through which an organisation might generate greenhouse gas emissions is illustrated in Figure XXX. These emissions sources are split into three types – known as Scope 1, 2 and 3. Different emissions sources will be of relevance to different types of organisations, particularly in relation to Scope 3. For TfN, these organisational emissions are likely to include:

- Scope 1 emissions, which are direct emissions resulting from activities that TfN can control, such as the gas used to heat our offices.
- Scope 2 emissions, which are indirect emissions resulting from the generation of any power that we use within our offices.

³ Image sourced from Carbon Trust and The Greenhouse Gas Protocol, 'A Corporate Accounting and Reporting Standard, Revised Edition' (2004).

- Scope 3 emissions, which cover indirect emissions as a result of our operations that are outside of TfN's direct control, albeit we can influence them through our working practices. This includes things like the emissions from the manufacture and transport of goods we use, like stationery and IT equipment, and also services we purchase, like cleaning and catering. It also includes emissions generated by our employees commuting and business travel, along with those generated by the disposal of our waste and our water consumption.

TfN is committed, by 2022, to understanding the carbon footprint of its organisational Scope 1 and 2 emissions and agreeing a target date for reducing these emissions to net-zero.

In the same timeframe, TfN will also develop a suitable carbon footprint scope for measuring its organisational Scope 3 emissions. This will reflect data availability, our environmental goals and the sources we can influence.

Emissions generated from the design, construction and operation of schemes within our Investment Programme, along with changes to the emissions generated by surface transport in the North as a result of TfN activity, are the main focus of this strategy document. Our approach to measuring these emissions and our Decarbonisation Trajectory are covered within Chapters 2 to 6.

Why a Decarbonisation Strategy?

To achieve a near-zero emissions surface transport network in the North by 2045, there must be a clear understanding of the policies and measures required to bridge the gap between future emissions projections and future emissions targets. TfN's Decarbonisation Strategy reflects work undertaken to define four plausible baseline emissions trajectories, based on our Future Travel Scenarios, and to identify and assess the gap between each trajectory and TfN's Decarbonisation Trajectory.

We have also undertaken a policy analysis to understand the policy ambition and suite of policy measures that could fill the policy gap for each scenario. This provides insights into the key, low-regret policy measures required under all scenarios, as well as the areas where TfN and partners are likely to require additional national support to achieve decarbonisation ambitions.

In terms of local action, this policy analysis provides tested, evidence based packages of measures that can be used by our partners and other organisations across our region, when developing their own plans.

Building upon these findings, this strategy lays out the North's minimum expectations in relation to both local and national decarbonisation policy ambitions. It is intended to provide an overarching framework for our partners and other organisations across the region to meet their decarbonisation responsibilities and ambitions.

The Strategy also recognises the importance of considering embodied carbon and climate change adaptation and resilience, drawing on the experience of our delivery partners, Highways England and Network Rail in these areas.

Finally, this strategy outlines TfN's key commitments to enabling the decarbonisation of surface transport in the North. Developed through research and engagement with partners, regional research bodies and industry, these relate to activities that would benefit from coordination at the regional level and can be most effectively undertaken by TfN. As part of this analysis, a key consideration for TfN, has been how the decarbonisation of transport can support our partners' economic growth ambitions, championing clean growth opportunities across our region. Cross-

sectoral co-operation and planning will be essential if the North is to deliver both a decarbonised transport system and capitalise on the possibilities from green industrial revolution, especially with the energy generation and distribution sector.

The timeline for undertaking these activities is outlined within Chapter 9, Priority Actions to 2025.

This strategy builds upon the four objectives in TfN's Strategic Transport Plan:

1. **Transforming economic performance:** We want to understand the full range of clean growth opportunities within the North as a result of transport decarbonisation.
2. **Increasing efficiency, reliability, integration and resilience in the transport system:** We want to integrate decarbonisation measures into existing and future programmes and projects in order to maximise efficiency and reliability gains (such as the electrification of our railway network). We also need to ensure that climate change adaptation and resilience is a key consideration in policy and project development.
3. **Improving inclusivity, health and access to opportunities for all:** The decarbonisation of transport in the North provides an important opportunity for reducing transport-related social exclusion. We want to ensure that decarbonisation measures optimise co-benefits relating to physical health, improved air quality and increasing levels of mobility for all communities and areas in the North.
4. **Promoting and enhancing the built, historic and natural environment:** While environmental conservation is the ultimate driver for decarbonisation, we need to consider the localised impacts of decarbonisation policies and measures. For example, local air quality, reduced noise levels, and the environmental impact of new infrastructure and operations required as part of the decarbonisation agenda (e.g. electrification infrastructure).

Chapter 2 - TfN's Decarbonisation Trajectory

What is TfN's Decarbonisation Trajectory?

Our route to a decarbonised transport system is illustrated by a measurable, evidence based and time-bound carbon emissions reduction curve, which starts with 'where we are now' and travels towards alignment with the objectives of the Paris Agreement, i.e. deep emissions reductions over the coming decades towards a zero-emissions transport system before 2050.

That journey is called our Decarbonisation Trajectory, with the shape of the curve being dictated by a series of interim emissions reduction milestones that ensure a rate of progress aligned to the Climate Change Committee's Carbon Budgets as a minimum.

Our agreed Decarbonisation Trajectory is shown in Fig X, with the headlines being:

- A 55% reduction in emissions from 2018 to 2030, achieved mostly through mode-shift and demand reduction.
- An 95% reduction in emissions from 2018 to 2040, reflecting longer-term decarbonisation measures, such as a high proportion of zero-emissions vehicles in the vehicle fleet.
- A close to zero date of 2045 for carbon emissions from surface transport in the North. This is a challenging benchmark reflecting the ambition of our partners and their desire to push further and faster than current national policy.

The scope of the emissions included within the trajectory is described below.

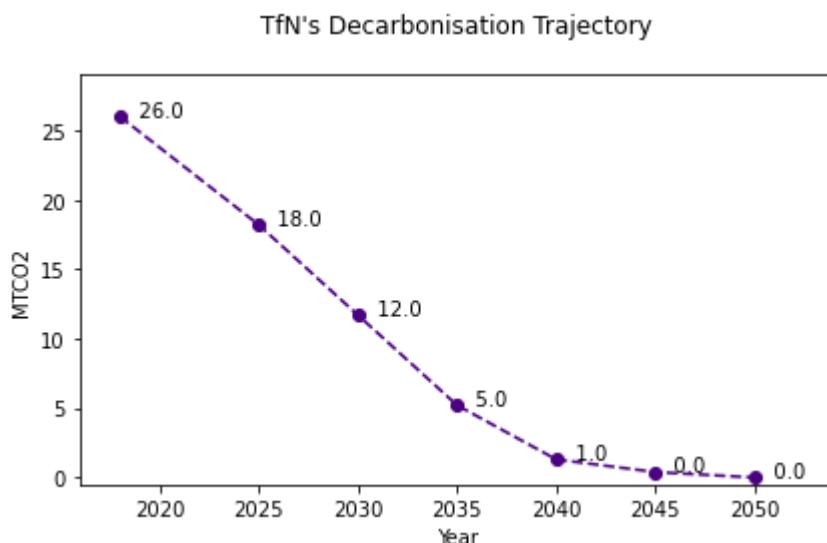


Figure X: TfN's Decarbonisation Trajectory

Why 2045?

A decarbonisation trajectory set at a regional scale is, by its nature, a compromise between areas that have set different decarbonisation timescales and have different geographies, demographics and patterns of passenger and freight demand.

A number of our partners have set ambitious, economy-wide decarbonisation targets with net-zero dates pre-2040 for their authority areas. The contribution of transport emissions reductions to these economy-wide targets will depend on progress in other sectors and the assumed availability of negative emissions measures, but it is clear that these authorities are aiming for transport emissions close to zero by 2040.

In preparing a Decarbonisation Trajectory, TfN seeks to achieve a compromise by moving faster than current national policy and the Climate Change Committee's advised trajectory, while being mindful of the varying levels of progress that our partners have made in terms of their own climate change responses. In this way, TfN's Decarbonisation Trajectory considers the ambitions of the whole region, but does not override or specify local place-based targets.

Indeed, the deep emissions reductions achieved by our most ambitious partners over shorter timescales will be needed if the region is to align itself, as a whole, with the level of reductions suggested by TfN's Decarbonisation Trajectory.

The **interim points** along our trajectory effectively represent an average for the region, with some areas' local transport systems decarbonising more quickly, while some may decarbonise slightly slower. The **end point** of our Decarbonisation Trajectory means that by 2045, emissions from surface transport in the North will need to be close to zero.

Figure X illustrates how different places within the North may move ahead with different trajectories, helping to achieve an average regional trajectory, but with all places reaching close to zero by the agreed end date.

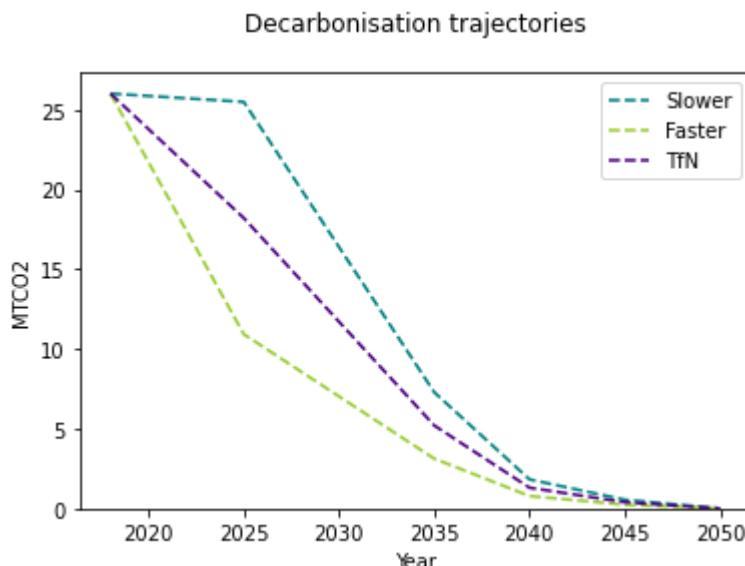


Figure X: TfN's Decarbonisation Trajectory reflects an average across local authorities that can decarbonise slightly slower or slightly faster.

Aligned to this, the programmes and projects that together make up TfN's Investment Programme should collectively emit close to zero carbon dioxide emissions by 2045. It is also true that many of these projects and programmes may actively help reduce emissions in the longer term, for example, rail schemes may lead to a reduction in car vehicle and road freight mileage. This consideration will be important as we look to benchmark ourselves against our trajectory over the coming decades.

What is included in our trajectory and why

TfN's Decarbonisation Trajectory comprises emissions from surface transport sources. This includes cars, vans and Heavy Goods Vehicles (HGVs), as well as bus and rail.

In recognition of TfN's remit, the Decarbonisation Trajectory relates to emissions from vehicle mileage that takes place on the transport network within the North, including through trips (e.g. Scotland to the South of England), as illustrated by the orange roads in **Figure X**.



Figure X: Map of the Northern boundary in which TfN operates. The blue section represents the areas that TfN covers and the orange roads represent the key roads within this boundary.

Other forms of transport with significant emissions profiles include aviation and shipping (both domestic and international), which together accounted for 11% of the UK's total emissions in 2019 (compared to 22% from surface transport sources). Eight percent of this was generated from aviation, of which 96% was from international aviation¹.

As these modes lie outside of TfN's jurisdiction, emissions from aviation and shipping are not accounted for within TfN's Decarbonisation Trajectory. Nevertheless, we recognise the need for aviation and shipping to be included in national targets and for strong national strategy in this area which aligns the UK aviation strategy with the Paris Agreement.

TfN believes that the emissions from all flights from airports in the North need to be fully aligned with the requirements of the Paris Agreement. This means operating within a defined carbon budget for UK aviation as part of a wider international budget.

EXAMPLE BOX: Manchester Airports Group has pledged to become a net-zero airport by 2038, and in 2020 launched a competition for the first airline to operate a zero-emission commercial flight from one of its airports. The contest, an industry first, will see the successful carrier win five years' free landing fees².

Some residual emissions from aviation and shipping are assumed within the current Government target of net-zero emissions, for the whole economy, by 2050. It is important to note that by

¹ <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019>

² [MAG launches zero-emission flight competition worth over £1million \(magairports.com\)](http://magairports.com)

excluding aviation and shipping from our trajectory, surface transport emissions will need to be zero by 2050.

As the vehicle fleet transitions to electric propulsion there will be an increasing demand for electricity, ultimately from zero carbon sources. Indirect emissions associated with electricity are not included within our Decarbonisation Trajectory, but we are planning to analyse how the demand will grow over time as part of a future phase of work. The CCC's Sixth Carbon Budget analysis sets out that electricity carbon intensity will need to fall by as much as 75% between now and 2030 and be close to zero by 2040, suggesting that indirect emissions will be small in the medium to long term.

TfN's Decarbonisation Trajectory, set at a regional level, also recognises the importance of scale when attributing longer distance journeys against decarbonisation budgets of smaller areas of spatial governance. For example, some authorities with relatively small populations may be assigned relatively large emissions because they happen to have a segment of motorway that passes through their boundary, or a large source of traffic, such as a seaport. If through traffic dominates local traffic, the ability of that authority to influence the carbon outcomes are low³.

Similarly, a smaller authority may choose to discount emissions from through traffic from their decarbonisation plans, resulting in the responsibility for considering those emissions slipping between the gaps of different areas and levels of spatial governance.

Figure X, compiled from National Travel Survey data, demonstrates that although approximately 95% of passenger trips (all modes) occur at a spatial scale that would suit consideration by a district, county or combined authority, these trips only account for about 65% of all miles travelled.

The remaining 35% of total miles travelled occur on journeys over 35 miles in distance, and whilst some of the longest trips would extend even outside of a pan-Northern focus, the majority of trips over 35 miles will be best considered at a pan-Northern level.

³ Marsden, G. (2020), The Role of Sub-National Transport Bodies in Carbon Governance, DecarboN8 working paper 3.1

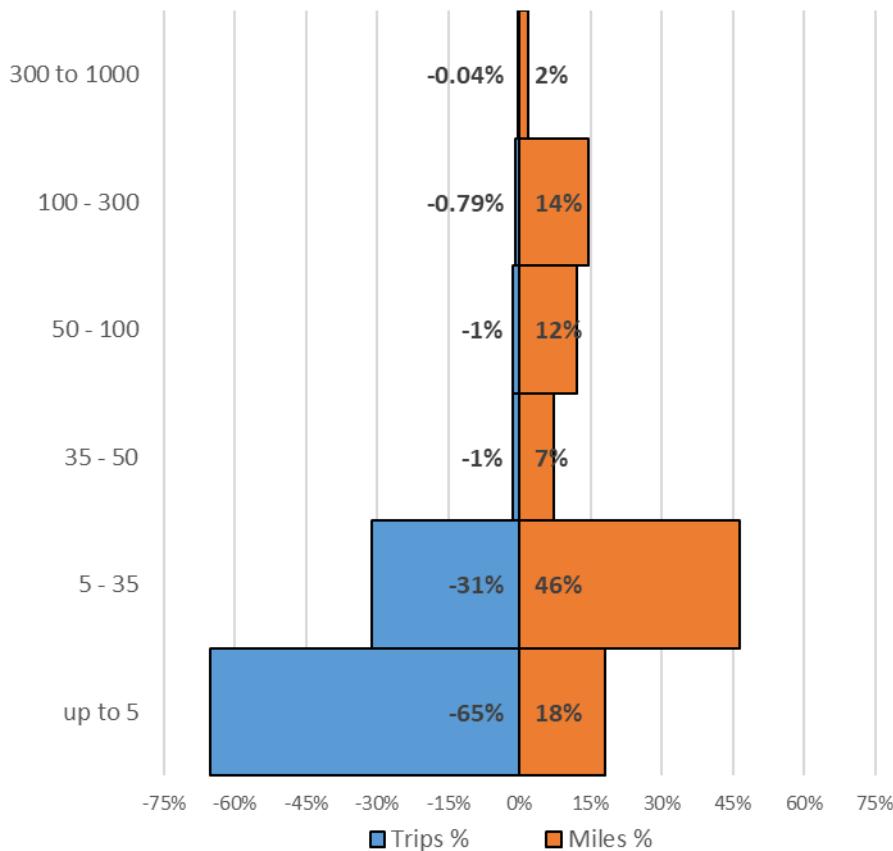


Figure X: Percentage of trips (all modes) and percentage of all miles, by trip length⁴

How we use our trajectory

Providing guidance

To understand the impact of our Investment Plan in terms of carbon emissions, we need to understand a number of things:

- Where are we likely to be living and working in the future, and what will our travel habits and patterns look like?
- What national and local transport policy is likely to be in place that may affect the carbon emissions of transport?

Once we understand the answers to these two questions, we can work out the approximate carbon emissions from surface transport at a number of set points in the future. These are our future baseline emissions, and when you join these points together, it forms our baseline trajectory.

Of course, the future is not certain, and for that reason TfN has created and modelled a number of [Future Travel Scenarios](#). These scenarios have given us the ability to calculate transport emissions change by scenario and area type - providing four plausible baseline emission trajectories. The scenarios were finalised in late 2020, and their underlying assumptions account

⁴ Source: Addel, M. Wadud, Z. and Anable, J. 'An exploratory analysis of long distance travel in England', 99th Annual Meeting of the Transportation Research Board (TRB), Jan 2020, Washington DC.

for both the economic shock due to the pandemic and a range of plausible outcomes for longer-term behavioural trends that could be affected by COVID-19, such as remote working. We will add to these any increase or reduction of emissions stimulated by our projects and programmes within our Investment Programme at any given point. Chapter 3 explains more about the characteristics of each Future Travel Scenario and how they have been used.

If our baseline trajectories, plus any emissions changes as a result of our Investment Programme, exceed our Decarbonisation Trajectory at any point in the future, the gap between the two is known as the **Policy Gap**. As part of the preparation of this strategy, TfN has modelled the Policy Gap for a number of interim points along the Decarbonisation Trajectory.

This Decarbonisation Strategy sets out how these Policy Gaps may be addressed through three main areas:

- Identification of additional local policy commitment required to achieve the Decarbonisation Trajectory.
- Identification of additional national policy commitment required to achieve the Decarbonisation Trajectory.
- Identification of actions that TfN could take to support our local partners and national government in developing and implementing their own measures.

The identification of required additional policy commitment is important as it helps TfN and its partners evidence and illustrate the additional support required from national government to achieve our decarbonisation ambitions as a region. This support could be in the form of additional national policy or Government provision of more devolved funding or powers. Chapter 4 sets out the change in policy commitment that we believe is required to bridge the policy gap found in each Future Travel Scenario, and Chapter 5 identifies and provides qualitative guidance on the measures that are likely to be required to achieve those policy commitments.

Making the right decisions

At a strategic level, we need to understand how TfN's Investment Programme (IP) affects the future projected emissions from surface transport in the North.

A number of Intervention Sequencing Strategies, which could deliver our IP, are due to be appraised against a number of environmental, social and economic criteria, to understand the full range of benefits that could be delivered by each Sequencing Strategy. As part of this process, changes to surface transport emissions generated in the North, as a result of these schemes will be modelled so that we understand what local and national decarbonisation policy commitment will be required at different points in the future to allow the schemes to be delivered within the parameters of TfN's Decarbonisation Trajectory. Ultimately, we will be asking the question: '*what needs to be true, if the North is to effectively decarbonise its surface transport as well as enjoy the significant connectivity, economic and environmental benefits that our IP will deliver?*'

Recognising that the development of local and national policy is ultimately the responsibility of our partners and national government respectively, and that our actual future travel habits may occur differently from the four plausible Future Travel Scenarios we have modelled, TfN will

embed consideration of our Decarbonisation Trajectory within the business case development process for individual projects within our Investment Programme.

This means that when the time comes to start to develop each individual project, over the next 30 years, we shall assess whether the carbon impact of the project is consistent with the Decarbonisation Trajectory, given the prevailing external policy context, travel habits and patterns. Recognising the detailed, and sometimes extended, consenting and design processes that precede the construction of major infrastructure projects, we shall assess the carbon impact of the project at both the concept / early design stage and then again once the detailed design is known, pre-construction.

In relation to the early design stage assessment, where a project may not deliver operational emissions in line with our Decarbonisation Trajectory, TfN will require mitigation measures to be developed as part of the project. Mitigation could take the form of fundamental design changes, influencing national government for further policy support or implementation of further local transport decarbonisation policy measures.

Following detailed design and before the start of construction, we will model the expected changes to surface transport emissions in the North during the expected year of opening to understand the potential success of any mitigation measures employed. If those changes to emissions are not consistent with our decarbonisation trajectory, we shall consider additional mitigation measures such as investigating further options to provide the same transport outcomes, through employing carbon sequestration measures such as integrating tree planting into schemes or investigating the feasibility of using innovative carbon ‘absorbing’ construction materials.

If it is not possible to mitigate the project’s impact upon emissions, the delivery of the project may be re-sequenced within the Investment Programme to a date when the future travel context enables the project to operate within the Decarbonisation Trajectory. For example, a particular road project may be re-scheduled to a point when the majority of additional traffic generated is by zero emission vehicles.

Our approach to incorporating the consideration of our Decarbonisation Trajectory within our decision making at both a strategic and project level is illustrated in [Figure X](#).

Making Better Decisions

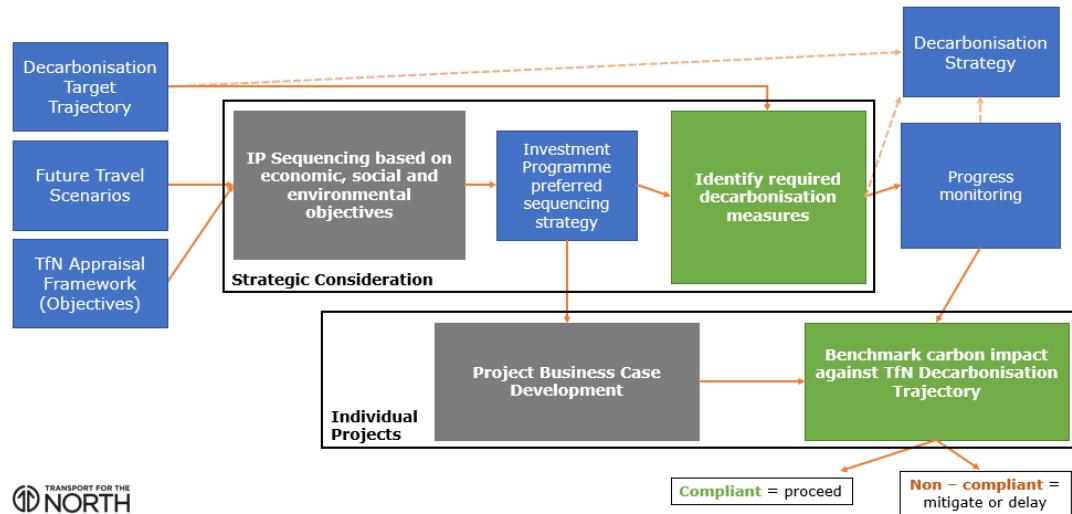


Figure X: Framework for assessing a project against TfN's Decarbonisation Trajectory

Chapter 3 - Estimating current and future emissions

Estimating current and future emissions is key to identifying the policy gap between baseline and decarbonisation trajectories. TfN's Northern Carbon Modelling Tool, NoCarb, was developed for this purpose, taking in historic demand, fleet and emissions data as well as those associated with TfN's Future Travel Scenarios.

This chapter outlines the context and rationale behind TfN's Future Travel Scenarios, and how they have been used through our Decarbonisation Pathway work as a tool for exploring plausible futures for which emissions can be estimated. As the starting point for all four Future Travel Scenarios, the chapter goes on to outline baseline emissions estimates for 2018, before presenting the unique emissions trajectory of each Future Travel Scenario.

Future Travel Scenarios

TfN's Future Travel Scenarios explore how trends in society, the economy and national policy could influence the level and distribution of travel demand in the future. By using a series of different Future Travel Scenarios, we aim to future-proof our decision-making as much as possible, making it resilient to wide-ranging and cross-sector uncertainties.

The Future Travel Scenarios represent factors¹ that are external to TfN's direct control, acting as 'reference cases' to test the performance of TfN strategies and policies against objectives. They form the starting point for TfN's Decarbonisation Pathways.

In each scenario, the level of national government ambition and support for decarbonisation in the North is different, as is the level and distribution of travel demand².

Assessing the decarbonisation 'policy gap' - that is, the gap between each Future Travel Scenario's emissions trajectory and the decarbonisation trajectory - will allow TfN to develop a resilient Decarbonisation Strategy that can adapt to different future circumstances. The policies and measures that are likely to bridge this policy gap are captured in TfN's Decarbonisation Pathways, which address the different levels of additional action required under each of TfN's four Future Travel Scenarios. This recognises that the same action applied in different scenarios will result in different levels of efficacy in terms of the emissions reductions required.

The Future Travel Scenarios were developed in partnership with Local Authority partners, national delivery partners and academic experts and informed by local strategies and priorities. The scenarios represent uncertainty across the following five external factors:

1. Growth in the population and economy;
2. Spatial planning policy and economic distribution;
3. National policy on environment and sustainability;
4. Technological change and advancement; and
5. Social and behavioural change.

The key elements of the scenarios can be summarised using the following set of 'what if' questions:

¹ A list of travel-related development, policies and measures under each Future Travel Scenario can be found in the [Future Transport Measures and Solutions Annex](#).

² Key national policy changes up to December 2020 are reflected within the Scenarios.

- **Scenario 1: Just About Managing** - What if society keeps developing broadly following existing trends? What if there is a gradual shift in lifestyles and travel, public and political behaviours do not alter, and we don't give up certain 'luxuries', leaving major developments and change to be shaped by market forces.
- **Scenario 2: Prioritised Places** – What if society becomes focused on quality of life, place-making and community, rather than primarily economic growth? This scenario is led by a change in priorities, with its biggest driver being the push for a fairer redistribution of economic prosperity.
- **Scenario 3: Digitally Distributed** – What if Northern Powerhouse ambitions³ are realised by using technology solutions to create connections and agglomeration across towns and cities? This scenario is led by technology and some policy influence, as we fully embrace technological change, work remotely, and use an accessible service-based transport system with connected and autonomous shared mobility options.
- **Scenario 4: Urban Zero Carbon** – What if society achieves Northern Powerhouse ambitions by using policy interventions to maximise energy efficient city growth and urban densification? This scenario is led by public and political attitudes to climate action and urban place-making, with the biggest drivers being strong Government policy, resulting in fast action on zero-emission transport systems and places, with integrated planning across energy, spatial and other sectors.

TfN's [Future Travel Scenarios Report](#) provides a comprehensive overview of the process undertaken to develop the new Future Travel Scenarios. It also delves into the contextual factors underlying each scenario and the expected implications on transport.

Modelling carbon emissions in the North

Over the past two years, TfN's Technical Assurance, Modelling and Economics (TAME) team has been developing and refining the Analytical Framework; a consistent set of data, modelling tools and appraisal approaches designed for TfN's programmes of transport strategy and business case development. TfN's NoCarb model forms part of the Analytical Framework and draws on other framework elements and data sources to estimate future vehicle emissions. These inputs relate to:

1. The composition of the vehicle fleet by size and fuel type;
2. The distribution of travel demand;
3. Emissions per kilometre travelled for each distinct type of vehicle.

Using these inputs, NoCarb carries out two core functions:

1. Projecting the make-up of future fleets using sales scenarios; and
2. Calculating emissions using fleet, emissions and demand inputs.

The first step involves projecting the make-up of the vehicle fleet under each of TfN's Future Travel Scenarios, while the second step estimates emissions based on the composition of the fleet and distance travelled in a given year. Estimates of kilometres travelled by each vehicle type under each of the Future Travel Scenarios were produced using TfN's travel demand modelling tools. Further information on NoCarb and these travel demand modelling tools is provided in [Annex B](#).

³ As set out in the [Northern Powerhouse Independent Economic Review](#).

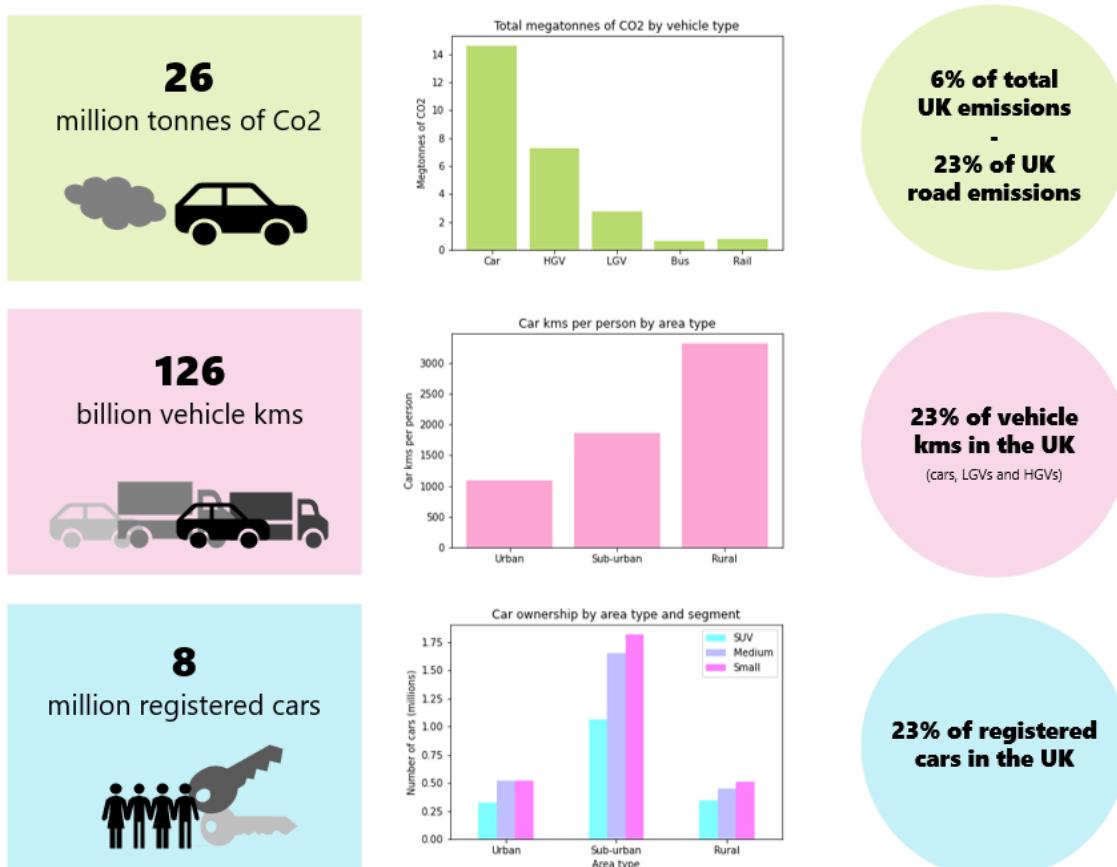
Baseline emissions in the North

Figure X provides headline figures related to baseline surface transport emissions in the North. At 26 mega-tonnes of CO₂, surface transport emissions in the North represent nearly one quarter of UK road emissions and 6% of total UK emissions. Over half of those emissions were generated by cars, with HGVs and vans producing 28% and 11% of surface transport emissions respectively. Bus and rail, on the other hand, represent just 5% of emissions.

A total of 126 billion kilometres were travelled in the North in 2018, representing 23% of vehicle kilometres travelled in the UK. The majority of the North's travel was through sub-urban areas, though distance per head was much higher for those in rural areas.

The North had 8 million registered cars in 2018. Large and SUV cars, which typically have higher emissions intensity, made up nearly one quarter of those cars and just under one third of new car sales in that year. This reflects a national trend over the last two decades, which has seen a gradual increase in the purchase of larger cars.

Urban areas typically showed lower CO₂ intensity and emissions per head of population than rural areas. However, there was some variation within area types, with coastal areas having slightly more fuel-efficient cars.



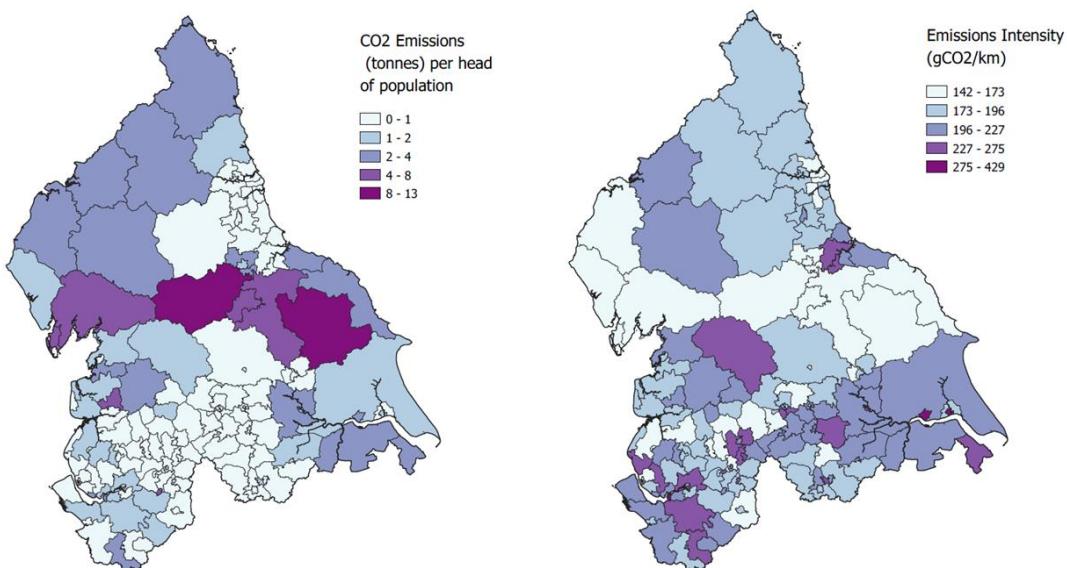
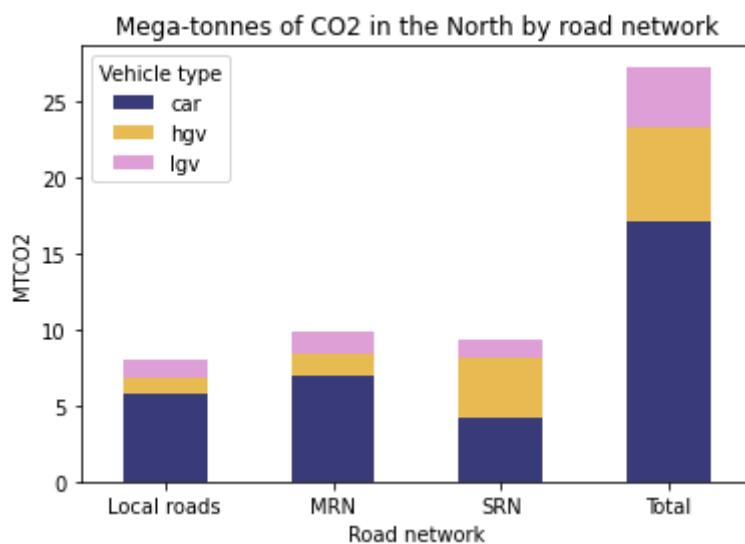


Figure X: Headline figures related to surface transport emissions in the North in 2018

70% of emissions in the North were on the Major and Strategic Road networks, indicating that a high proportion of emissions from private road vehicles is generated by longer distance regional-level trips.



The next two sections show how emissions vary by travel type and traveller type in the North of England at a regional level. We have used disaggregate trip data from the National Travel Survey to carry out this illustrative analysis, as some of the parameters are not currently included within NoCarb.

Emissions by trip purpose and distance

The majority of car emissions in the North related to non-employment related travel, with 67% generated by 'other' travel, 24% by commuting and the remaining 9% by business travel.

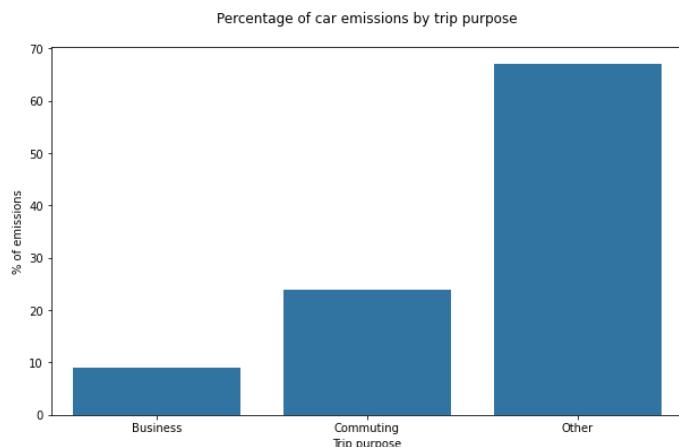
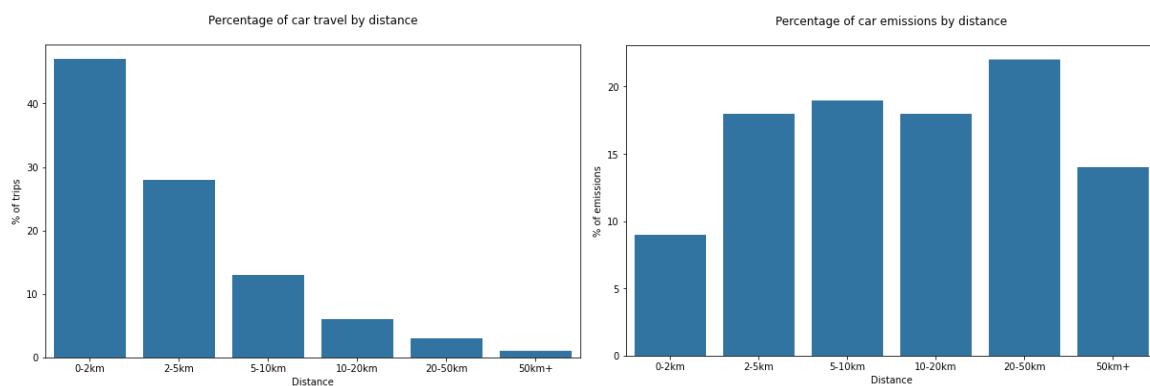


Figure X: Percentage of car emissions in the North in 2017 by trip purpose.

Through an increase in remote working and social distancing measures, the pandemic has demonstrated the potential for car emissions to be reduced across trip purposes. In the short-term, as we wait for a greater proportion of the vehicle fleet to be replaced by zero-emissions vehicles, reducing car travel will play a vital role in meeting decarbonisation targets.⁴

Three-quarters of car trips in the North were under 5 kilometres, and just under 90% under 10 kilometres. Given their short distance, a notable proportion of these trips could be switched to walking, cycling, e-bikes, or public transport. Medium and long-distance trips, on the other hand, made up the majority of car emissions, with trips over 10 kilometres generating 54% of car emissions. Trips over 50 kilometres, while only representing 1% of car trips, were responsible for 14% of emissions. The difficulty of shifting these trips to cleaner modes demonstrates the importance of decarbonising the vehicle fleet in order to meet decarbonisation targets in the medium and long-term.



Figures X and X: Percentage of car trips by distance (left) and percentage of emissions by distance (right)

Distributional impacts

⁴ The CCC estimates that 36% of mitigation will come from “demand reduction” (which includes mode-shift) in the period to 2025.

Distribution of emissions by employment group⁵

Different sections of the community produce varying rates of emissions. Our analysis⁶ suggests that individuals in managerial and professional occupations produced the highest car and van emissions per capita out of all employment groups (**Figure X**), representing around half of car and van emissions in 2018. Alternatively, non-working individuals produced the lowest car and van emissions per capita (less than 2% of emissions in 2018).

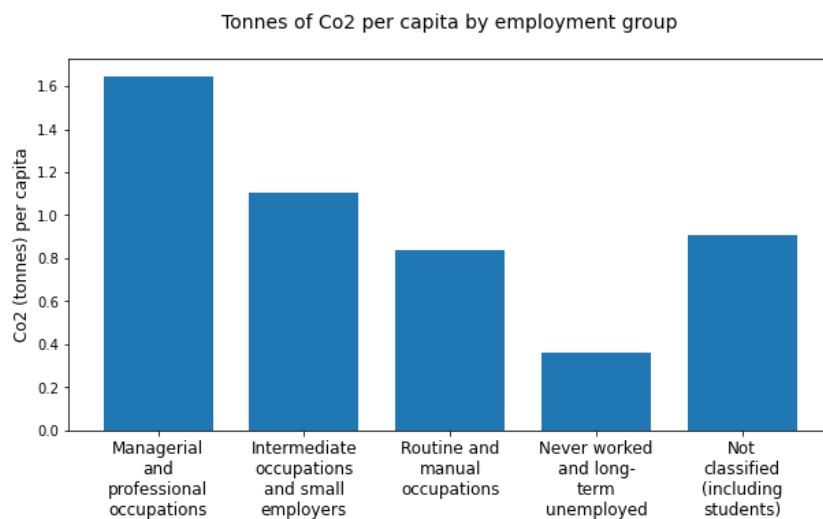


Figure X: Tonnes of CO₂ per capita by employment group.

Individuals in managerial and professional occupations were similarly responsible for the majority of rail emissions, making up over 60% of the total distance travelled by rail.

With the lowest total emissions of all modes, bus travel was slightly skewed towards those in routine and manual occupations and unclassified individuals (representing 38% and 15% of bus emissions respectively). Individuals in managerial and professional occupations, on the other hand, represented just 22% of bus emissions in 2018. These figures align with evidence that lower income groups are more likely to use buses than those on higher incomes, as the cost of bus travel is lower than trains and cars.⁷ This highlights that, to effectively reduce surface transport emissions, proportionately greater focus will be needed on transport decarbonisation measures that are likely to affect higher-income groups.

Distribution of emissions by gender

⁵ These employment groups relate to the Office for National Statistics' [Socio-economic classifications \(NS-SEC\)](#).

⁶ This analysis was derived from the National Travel Survey 2017, filtered to only include trips that took place in the North. The share of emissions was assumed to be equivalent to the share of car, van and taxi kilometres travelled by each group. For the purpose of this analysis, it was not possible to isolate unique trips, so there may be some instances where trips were counted more than once (i.e. where people from the same household travelled together). Looking exclusively at trips undertaken by car/van drivers (or taxi passengers over 16 years old), the trends explained in this section are even more extreme. For example, the share of emissions increases from 50% to 54% for individuals in managerial and professional occupations and increases from 52% to 60% for men. The share of car and van emissions does not reflect the type and age of vehicles, meaning that newer, lower-emitting cars may slightly offset some of the emissions by higher-income groups.

⁷ [Gates, Shivonne et al. Transport and inequality: An evidence review for the Department for Transport. NatCen Social Research. 2019.](#)

Responsible for 52% of car and van travel in the North, men produce slightly higher car and van emissions per capita than women (Figure X). This is equivalent to the gender split of drivers, with 52% of trips recorded as having a man as the main driver. Trips taken by men also have slightly lower car occupancies, with an average of 1.93 people in a car or van compared to 2 for women.

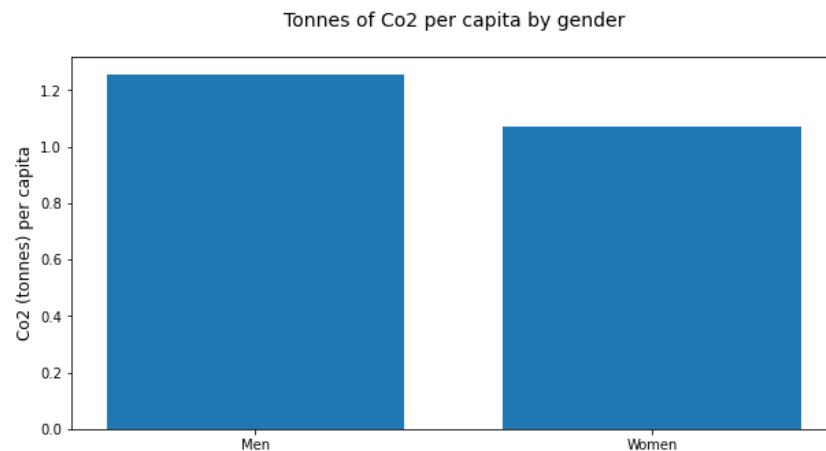


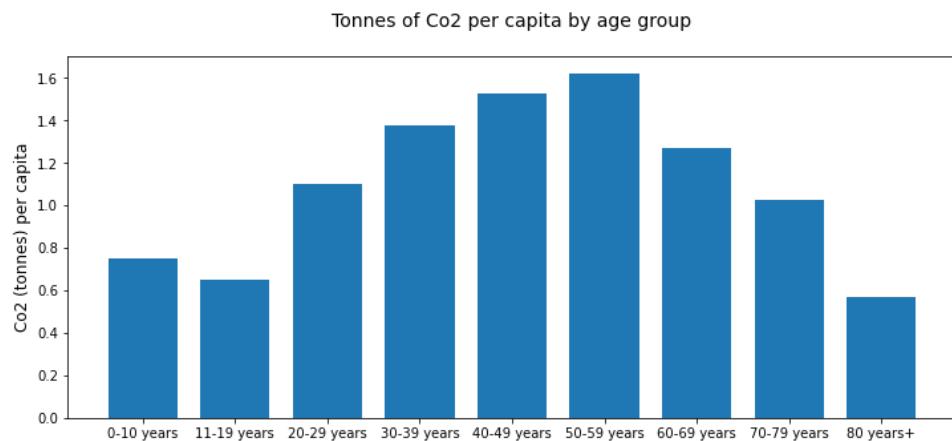
Figure X: Tonnes of CO₂ per capita by gender.

Men represent just over half of rail emissions, making up 55% of rail travel in the North. The opposite is true for bus travel, with 55% of emissions produced by women.

Distribution of emissions by age

Over 50% of car and van emissions, and 60% of rail emissions, were produced by people aged 30-60 years old. Covering most of the working age population, this likely reflects more commuting, business and escort⁸ trips.

50-60 year-olds had the highest share of car and van emissions per capita out of all age groups (Figure X), while children, teenagers and people over 80 had the lowest per capita emissions.



⁸ Such as driving children to school or other activities.

Figure X: Tonnes of CO₂ per capita by age group.⁹

Bus travel was weighted more towards groups outside of the typical working age. 11-19 year-olds represented the highest share of bus emissions at 22%, and 60-69 and 70-79 year-olds together represented 29% of bus emissions.

What this means for decarbonisation

While this section provides a high-level overview of how emissions can vary across groups, it is not an exhaustive list; nor does it capture the complex relationships between income, gender, age, disability, location (to name a few) and carbon consumption. For example, research suggests that low-income individuals in rural areas experience the worst effects of transport poverty, with high transport costs and low public transport access.¹⁰ Nevertheless, emissions intensity and emissions per head is often higher in rural areas compared to urban and sub-urban areas. This means that these individuals could be disproportionately disadvantaged by targeted decarbonisation measures, such as emissions-based fees for road-use charging.

Considering the impact of decarbonisation methods on different groups is critical to ensuring that the gap between disadvantaged and privileged groups is narrowed rather than widened. This is discussed further in Chapter 5.

Future emissions estimates

Scenario 1: Just About Managing

Under Just About Managing, economic growth continues at a moderate rate and is largely market-driven, consumption-led and unequal (both geographically and socially). While there is global climate change awareness, as people become more conscious of regular disasters, the policies introduced under this scenario are not radical enough to meet the UK carbon budgets and the net-zero target of 2050.

The main consequence of this scenario is that highway networks become increasingly congested, and public transport levels remain similar to today. This is also reflected at the global scale, meaning that extreme weather events become more common in the UK, leading to frequent disruption to transport networks.

Mode	Demand growth 2018-2050	CO ₂ emissions in 2030 (mega-tonnes)	CO ₂ emissions in 2050 (mega-tonnes)
Rail	83%	0.6	0.4
Bus and shared mobility	-3%	0.3	0.0
Car	28%	10.9	0.0
Van	47%	1.7	0.0
HGV	6%	8.0	7.0
Active travel	4%	0.0	0.0

⁹ Emissions have been assigned to passengers as well as drivers.

¹⁰ Gates, Shivonne et al.

What if society continues to develop in line with existing trends?

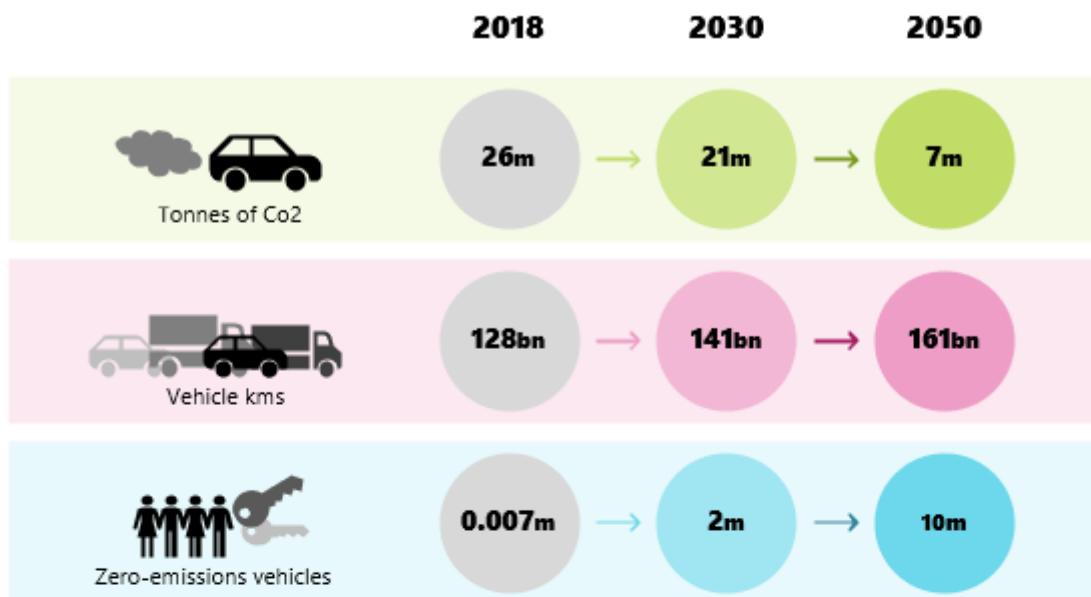
- Existing trend of urbanisation and growth distribution continues. Little change in demographics and from travel behaviour seen today.
- No transformation in level of economic growth. Reactive political direction results in a rigid economy, lacking agility and vulnerable to economic shocks.
- Net Zero 2050 target not met – climate change and travel disruption becomes more extreme.
- Technology uptake driven by existing policy; Electric Vehicle (EV) uptake at slowest rate of all four scenarios and some autonomy. Continuation of shared transit and public transport use as seen pre-2020.
- Continued trends of active travel, with increases experienced during 2020, although any further step-change increase would require a continued and committed impetus.
- Moderate growth in remote working. Continuation of freight transportation as seen today.

Area type	Population in 2050 (millions)	Vehicle kilometres in 2050 (billions)	CO ₂ emissions in 2050 (mega-tonnes)
Urban	3.9	21.9	0.8
Sub-urban	9.8	90.0	4.8
Rural	2.3	49.0	1.5

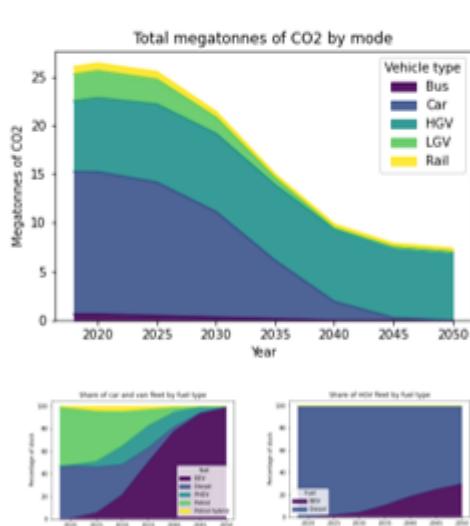
Increases in car and van demand are largely offset by a growing share of zero-emissions vehicles. However, due to the higher costs associated with zero-emissions HGVs, most continue to be run on diesel. This makes up almost all residual emissions in 2050, which stand at just under 25% of 2018 levels.

Vehicle type	Fuel type	Share
Car	BEV	99%
Car	PHEV	1%
Van	BEV	98%
Van	PHEV	2%
HGV	BEV	27%
HGV	Diesel	73%

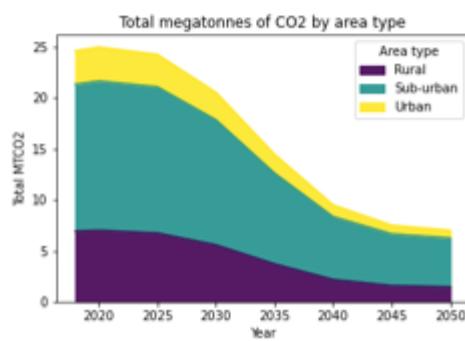
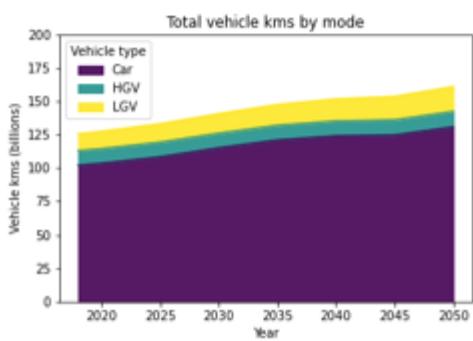
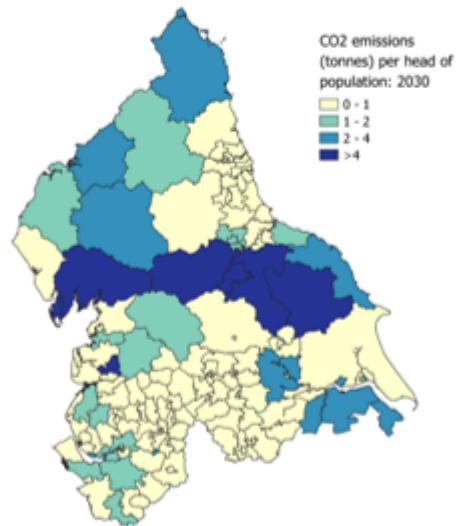
Just About Managing



Mode and fuel breakdown



Area breakdown



Scenario 2: Prioritised Places

Prioritised Places sees a focus on work-life balance and social equity within and between places. This involves a shift in the UK's political and economic direction to ensure that no place is left behind. Every area, including cities, towns and rural and coastal areas, has a bespoke local economic strategy, supported by investment in local assets and economic and social infrastructure. This scenario is led by a change in priorities, with the biggest driver being the push for a fairer redistribution of economic prosperity.

Although an emphasis on localising activity and use of public transport helps to reduce emissions at a more rapid rate, a failure to sufficiently embrace technology sees continued private mobility ownership and a struggle to realise a fully zero-emission transport network before 2050.

Mode	Demand growth 2018-2050	CO ₂ emissions in 2030 (megatonnes)	CO ₂ emissions in 2050 (megatonnes)
Rail	122%	0.6	0.4
Bus and shared mobility	19%	0.3	0.0
Car	30%	10.0	0.0
Van	47%	1.6	0.0
HGV	1%	7.6	6.7
Active travel	13%	0.0	0.0

What if society becomes more focused on place, place-making and community than growth or connectivity?

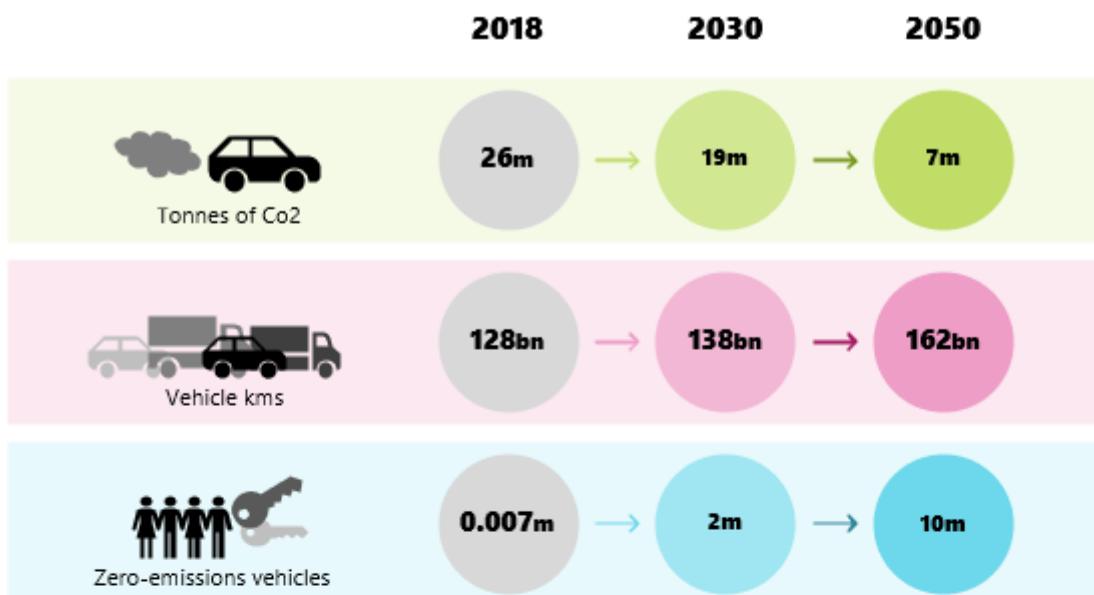
- Bespoke local strategies, focusing on quality of life, place-making and community, rather than primarily economic growth. Slower growth in cities, more in towns and rural/coastal areas.
- No transformation in level of economic growth, but society is more equitable and there is a fairer distribution of prosperity across the region.
- Moderate growth in electric vehicles and some autonomy, especially in cities. Realisation of benefits for vulnerable groups, people with disabilities and extending Autonomous Vehicle (AV) networks to more isolated areas.
- Continued private mobility ownership sees a struggle to realise a zero-emission transport network.
- More active and public transport within communities. People value face-to-face interaction.
- Focus on work-life balance and social equity within and between places.

Area type	Population in 2050 (millions)	Vehicle kilometres in 2050 (billions)	CO ₂ emissions in 2050 (megatonnes)
Urban	3.8	20.7	0.7
Sub-urban	9.6	87.8	4.5
Rural	2.7	53.4	1.4

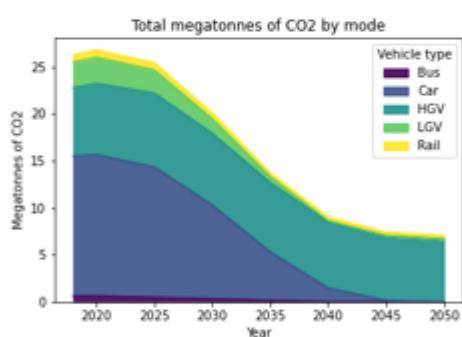
Similar to Just About Managing, increases in car and van demand are largely offset by a growing share of zero-emissions vehicles. Most HGVs also continue to run on diesel, though only a marginal increase in demand means that the emissions are slightly lower.

Vehicle type	Fuel type	Share
Car	BEV	99%
Car	PHEV	1%
Van	BEV	99%
Van	PHEV	1%
HGV	BEV	27%
HGV	Diesel	73%

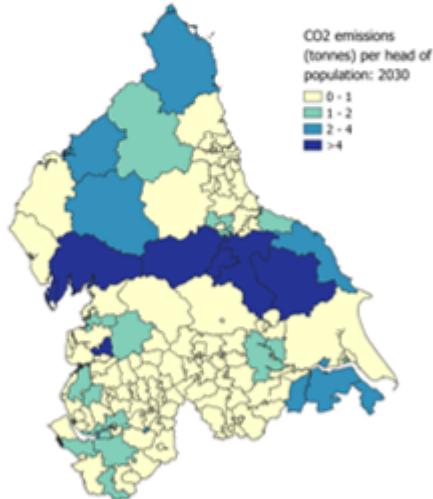
Prioritised Places



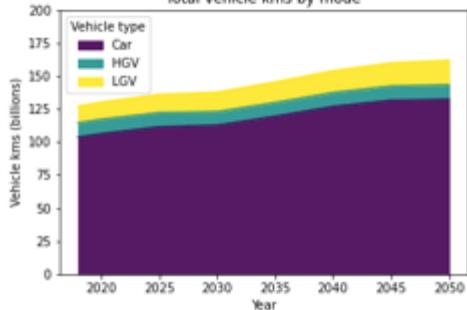
Mode and fuel breakdown



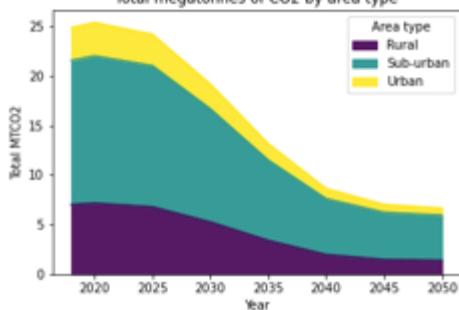
Area breakdown



Total vehicle kms by mode



Total megatonnes of CO2 by area type



Scenario 3: Digitally Distributed

This scenario sees a future where digital and technological advances accelerate, transforming how we work, travel and live. In general, we embrace these technological changes and the move towards a distributed, service-based transport system, with the biggest drivers being technical advances and a willingness to embrace mobility-as-a-service and shared mobility.

Long-term climate change targets are met, but there is slow progress in the short-term due to a general preference for individualised mobility over traditional public transport.

Mode	Demand growth 2018-2050	CO ₂ emissions in 2030 (megatonnes)	CO ₂ emissions in 2050 (megatonnes)
Rail	78%	0.6	0.0
Bus and shared mobility	11%	0.3	0.0
Car	44%	9.6	0.0
Van	74%	1.6	0.0
HGV	4%	7.9	1.2
Active travel	6%	0.0	0.0

What if society achieves Northern Powerhouse Independent Economic Review (NPIER) outcomes by using technological solutions to create connection and agglomeration across towns and cities?

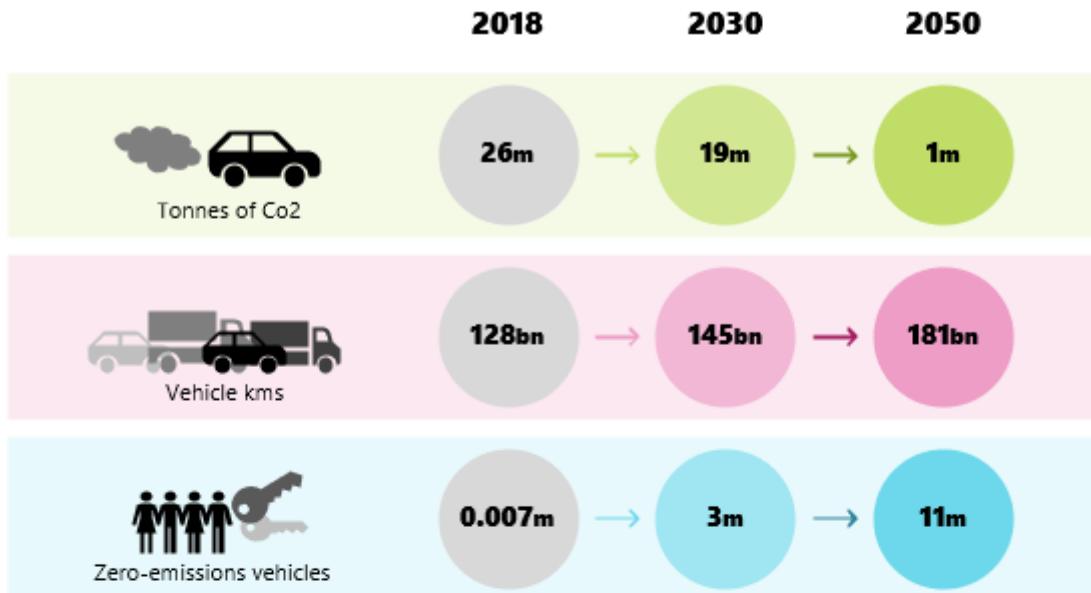
- Growth dispersed between cities and towns and less city-centric.
- High uptake of EV, Ultra Low Emissions Vehicles (ULEVs), Zero Emissions Vehicles (ZEVs) and driverless vehicles means zero emissions before 2050 (but slow progress in short-term). Some fiscal and regulatory action to influence technology use, but congestion persists in places due to availability of transport options. Increased digital remote working and dispersed employment means trip lengths are longer but less often.
- General willingness to embrace Mobility-as-a-Service (MaaS) and shared mobility - through technology acceptance which supports increased efficiency and use of road capacity.
- Freight warehousing, distribution and logistics centres are distributed.
- Transformational economic growth as towns and cities see polycentric agglomeration and become more interdependent, due to better skills-matching within geographical areas.

Area type	Population in 2050 (millions)	Vehicle kilometres in 2050 (billions)	CO ₂ emissions in 2050 (megatonnes)
Urban	4.0	24.4	0.1
Sub-urban	10.6	101.4	0.8
Rural	2.6	54.9	0.3

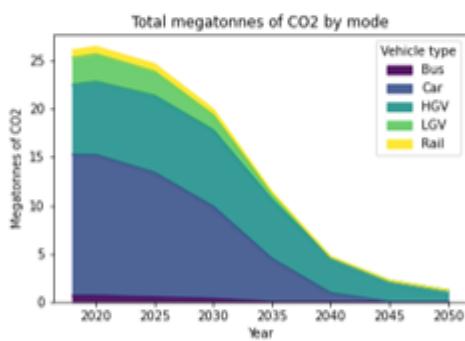
With just under 1 MTCO₂ of residual emissions in 2050, this scenario sees the benefits of decarbonising HGVs earlier, with over 85% running on hydrogen or battery electric fuel cells.

Vehicle type	Fuel type	Share
Car	BEV	100%
Van	BEV	100%
HGV	BEV	38%
HGV	Diesel	14%
HGV	Hydrogen	47%

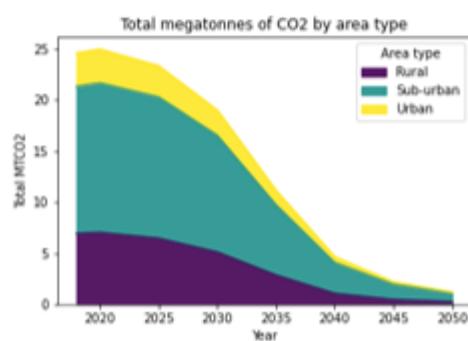
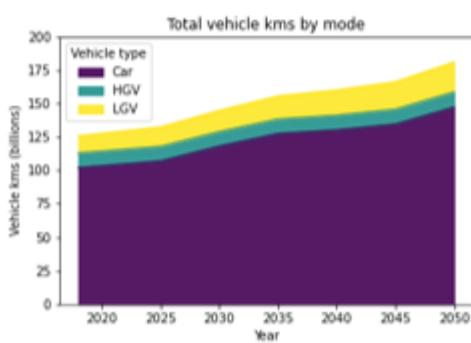
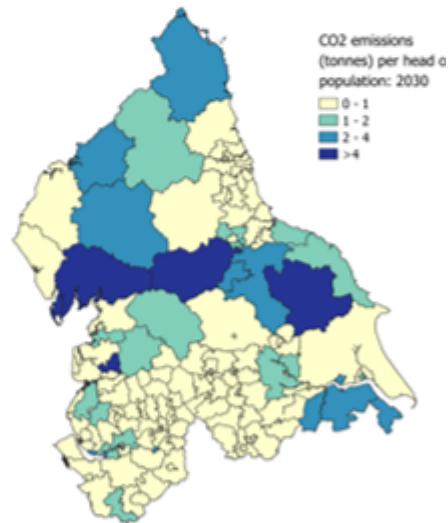
Digitally Distributed



Mode and fuel breakdown



Area breakdown



Scenario 4: Urban Zero Carbon

This scenario sees a significant shift in public attitudes towards action on climate change, and a strong government response to meet it. Transport and energy planning and systems are adapted and integrated to deliver effective clean networks. All road transport is powered by electric drivetrains ahead of 2050, with an increasing supply of low-carbon hydrogen available for some vehicles.

This scenario is led by attitudes to climate action and urban placemaking, with the biggest drivers being strong government policy and urban densification.

Mode	Demand growth 2018-2050	CO ₂ emissions in 2030 (megatonnes)	CO ₂ emissions in 2050 (megatonnes)
Rail	193%	0.6	0.0
Bus and shared mobility	21%	0.3	0.0
Car	10%	7.1	0.0
Van	50%	1.2	0.0
HGV	-3%	7.6	1.1
Active travel	30%	0.0	0.0

What if society achieves NPIER outcomes by using policy intervention to maximise energy-efficient city growth?

- Cities and large towns become more dense but attractive places to live. Large rural settlements may benefit, others will see reduction in population and employment without support of national policy.
- Transformational economic growth primarily through urban agglomeration and place-making.
- Strong fiscal and regulatory action set us on a pathway to zero carbon before 2050. Increased devolution leads to integrated transport and energy systems which deliver clean networks.
- Urban living reduces remote working and increases urban freight consolidation centres.
- Increased public and active transport, including shared mobility, as public and private travel becomes blurred.
- All new vehicles have a high level of autonomy, but are not fully autonomous by 2050. Shared AVs are well integrated into urban transport systems to complement public transport, but this doesn't extend to rural areas or small towns. Opportunities are not available to all, both geographically and due to attitudes and abilities with technology, sharing and data use.

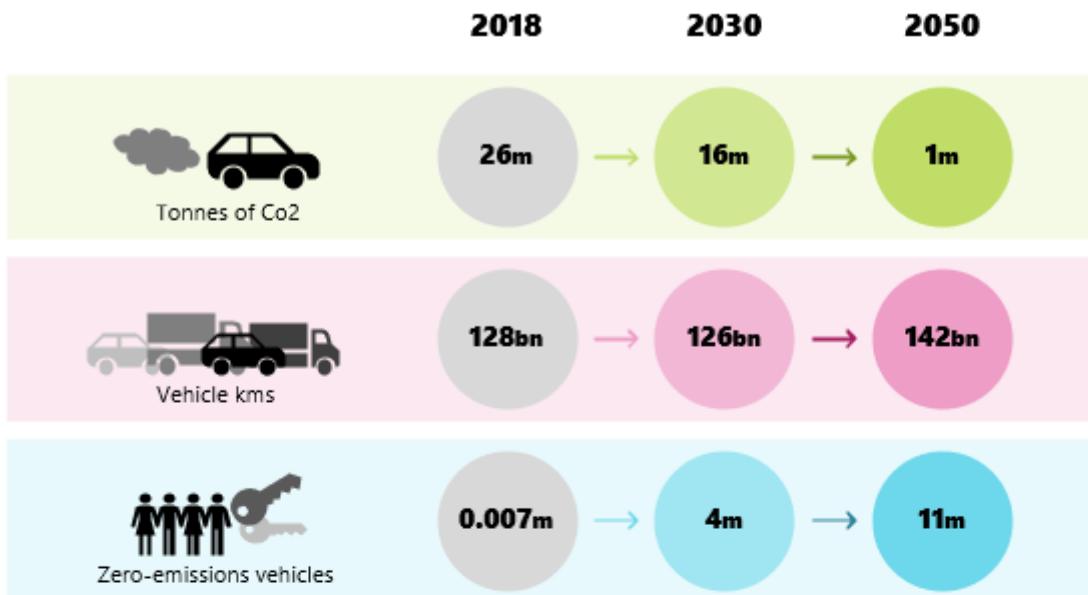
Area type	Population in 2050 (millions)	Vehicle kilometres in 2050 (billions)	CO ₂ emissions in 2050 (megatonnes)
Urban	4.9	20.6	0.1
Sub-urban	10.0	78.8	0.8
Rural	2.3	42.4	0.2

This scenario sees increased demand across public transport and active modes, with a decrease in HGV demand. Consequently, it sees the lowest residual emissions (attributed to a small number of diesel HGVs) in 2050 at just over 1 MT CO₂.

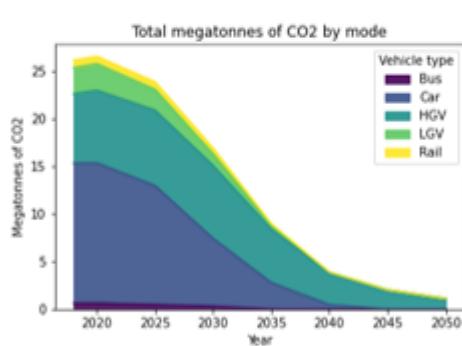
Vehicle type	Fuel type	Share
Car	BEV	100%
Van	BEV	100%

HGV	BEV	38%
HGV	Diesel	14%
HGV	Hydrogen	47%

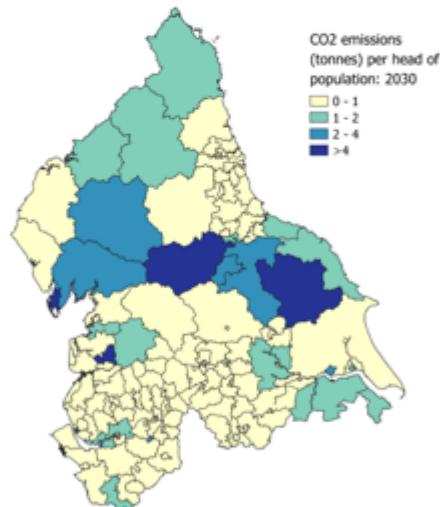
Urban Zero Carbon



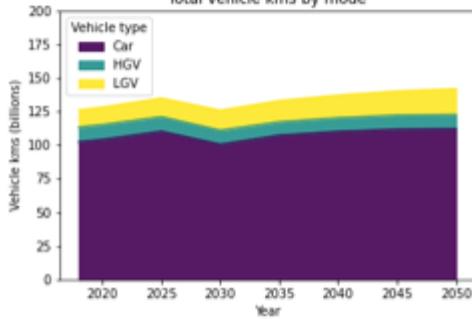
Mode and fuel breakdown



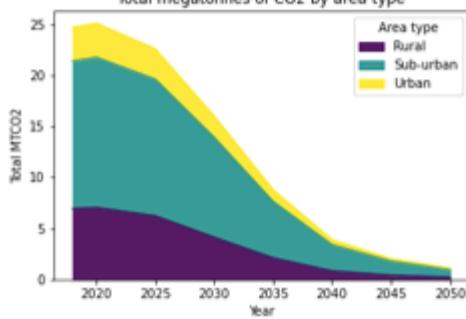
Area breakdown



Total vehicle kms by mode



Total megatonnes of CO2 by area type



Chapter 4 – Decarbonisation Pathways

Chapter 2 set out TfN’s Decarbonisation Trajectory and Chapter 3 introduced the Future Travel Scenarios, which show varying levels of progress towards that trajectory as a result of background trends and the different plausible policy approaches that national government might take. In this chapter we examine the ‘policy gap’ that could exist between these baseline scenarios and the trajectory, establishing the broad Decarbonisation Pathways that TfN and partners could seek to follow to close the gap in the coming decades.

Figure X shows the Decarbonisation Trajectory alongside the four baseline trajectories, with our estimated minimum and maximum scale of the policy gap in 2030 shown as an example.

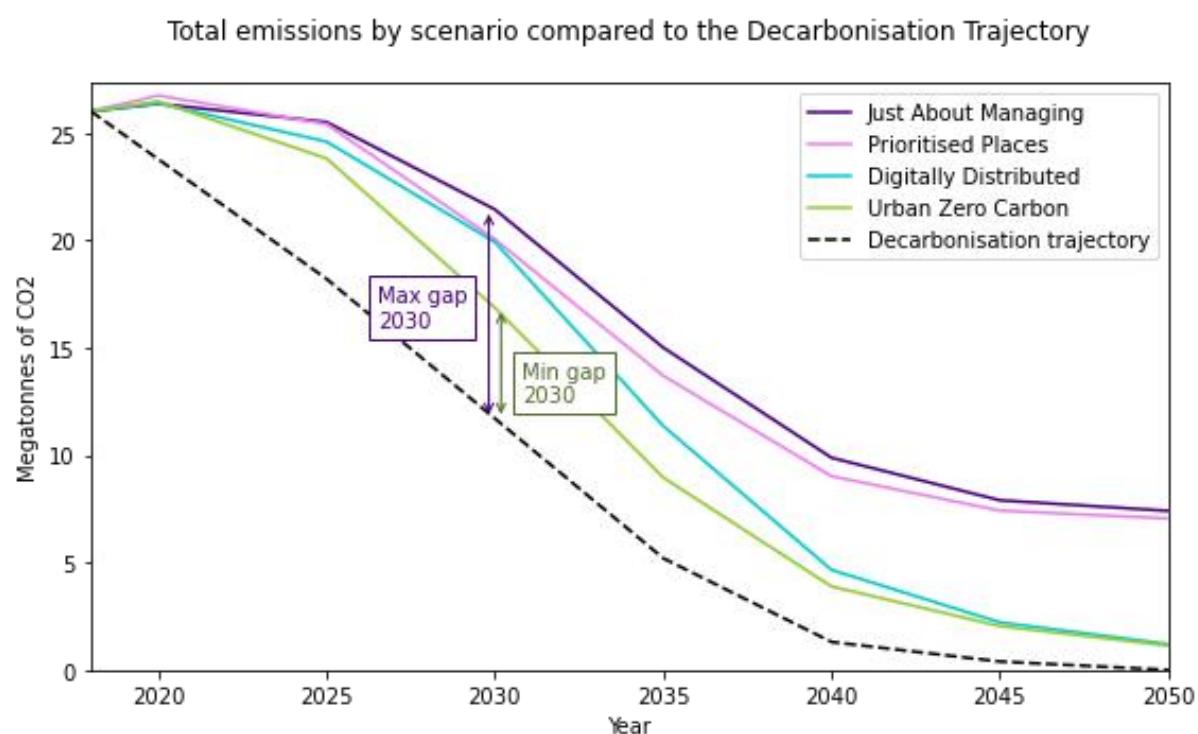


Figure X: Total emissions under each Future Travel Scenario compared to the Decarbonisation Trajectory, demonstrating the policy gap that needs to be filled between each scenario.

The Decarbonisation Trajectory sets a total carbon budget of 85 mega-tonnes of CO₂ to 2050. All scenarios exceed this budget by 2030 (see Figure X), despite Urban Zero Carbon and Digitally Distributed achieving close-to-zero emissions by 2050. This demonstrates the importance of rapidly reducing emissions in both the short and long term.

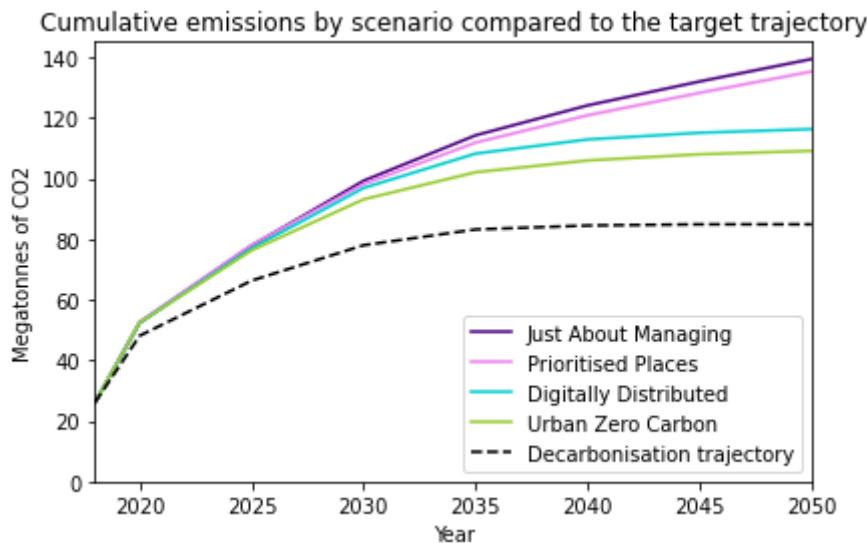


Figure X: Cumulative emissions under each Future Travel Scenario compared to the Decarbonisation Trajectory.

Year	Absolute gap (mega-tonnes CO ₂)		Cumulative gap (mega-tonnes of CO ₂)	
	Max	Min	Max	Min
2025	9	7	12	10
2030	11	6	21	15
2035	9	2	31	19
2040	7	1	40	21
2045	7	2	47	23
2050	7	1	55	24

A number of key messages can be drawn from this table:

- **In the short term**, there is a large absolute policy gap across all four scenarios, which exhausts the entire carbon budget to 2050. It will be challenging to bridge this gap with policies that take time to have an effect, such as vehicle fleet policies that only tend to affect new vehicles, or infrastructure that takes time to plan and construct. Demand-management and mode-shift policies that can be implemented quickly will be key.
- **In the longer term**, recent policy announcements have significantly reduced the uncertainty around emissions from light duty vehicles, meaning the absolute policy gap could be relatively small in some scenarios. However, significant uncertainty remains in relation to larger HGV emissions, with a requirement to find a zero-emission solution that can start to be rolled out during the 2030s.

Bridging the gap will involve a combination of policies and regulations that target vehicle sales, mode-shift, demand reduction and improved fuel efficiency. As a first step in assessing how the gap

can be closed, we have established some broad-brush ‘rules of thumb’ on the scale of change needed in the vehicle fleet and in road transport demand – we refer to these as our Decarbonisation Pathways. In Chapter 5, we set out a more detailed analysis of the policies that might be needed to achieve the required scale of change. This policy analysis forms the building blocks of our Decarbonisation Strategy.

Each of the Future Travel Scenarios reflect the Government’s ban on the sale of new petrol and diesel vehicles from 2030 and new hybrid vehicles by 2035, though the timing and potential for decarbonisation of HGVs is still largely uncertain. While the 2030 ban is a significant reform, rapidly increasing zero-emissions vehicle sales and shifting towards smaller, less polluting vehicles sales in the period to 2025 will be crucial and further policy commitment will likely be needed.¹

In addition to a change in fleet composition, policies that shift demand to active and public transport modes, reduce demand overall and improve fuel efficiency will be necessary in both the short and long-term. These policies are especially important in the short-term as fleet composition changes and infrastructure developments take time to implement.

Table X: Broad measures that must be put in place (relative to a given year) in order to reduce emissions in line with the Decarbonisation Trajectory.

		2025	2030	2035	2040	2045
Zero-emissions share of sales²	Cars	55%	100%	100%	100%	100%
	Vans	40%	100%	100%	100%	100%
	HGVs	26%	44%	72%	100%	100%
BEV high mileage CO₂ reduction	Cars	20%	20%	20%	20%	20%
Public transport CO₂ reduction on baseline	Bus	15%	40%	70%	90%	100%
	Rail	0%	25%	75%	100%	100%
Reduction in distance travelled	Cars	1-7%	3-14%	3-14%	3-14%	3-14%

¹ In line with CCC analysis (Fifth Carbon Budget), vehicle efficiency improvements (as defined by planned EU/UK new vehicle regulations) have been reflected in all Future Travel Scenarios.

² All of the measures outlined in this table are relative to the baseline in a given year (they are not cumulative or related to 2018). For example, the BEV high mileage CO₂ reduction in 2030 relates to emissions that have been projected in 2030 under each scenario.

relative to baseline growth	Vans ³	5%	10%	10%	10%	10%
	HGVs	3-5%	11-15%	6-15%	6-15%	6-15%
Conventional vehicle efficiency CO₂ reduction⁴	Cars and vans	3.6%	3.6%	3.6%	3.6%	3.6%
	Artic HGVs	22%	22%	22%	22%	22%
	Rigid HGVs	13%	13%	13%	13%	13%
Share of car sales	Large cars ⁵	27%	22%	17%	10%	10%

Table X outlines the broad pathways to bridge the policy gap in all Future Travel Scenarios. The measures demonstrate the significant scale of change required in both the short and long-term, requiring over half of car sales, and 40% of van sales, to be zero-emissions in the next four years. This also requires a reversal of recent trends favouring the purchase of larger cars – from 32% of car sales in 2018 to 20% in 2025, and 10% from 2030.

As we wait for zero-emissions vehicles to make up a larger proportion of the vehicle fleet, car demand (i.e. the total vehicle kilometres projected to be travelled in a given year) will need to be reduced by 1% to 4% in 2025⁶ and 3% to 14% in 2030⁷ to bridge the residual emissions gap. Van and HGV demand reduction will also be required, achieved through a combination of operational and logistics efficiencies and freight mode-shift where possible.

Finally, improving the fuel-efficiency of conventional vehicles is an essential component to emissions reductions. Recent evidence from the Climate Change Committee suggests that eco-driver training and enforcement of 70mph speed limits could improve conventional car efficiency by 3.6%, and that improved aero-dynamic designs and drag reduction, in combination with driver training, could improve artic and rigid HGV efficiency by 22% and 13% respectively. To support rapid emissions reduction in the short-term, the maximum improvement in conventional vehicle efficiency will be required by 2025.

The scale of change identified in this section is indicative of the difficulty of the decarbonisation challenge which is faced everywhere. The changes shown here are not policies set in stone but show that rapid action will be required across mode-shift, technological change and demand reduction on a significant scale.

³ The next stage of analysis will consider scenario-specific variation in van demand. However, it is worth noting that van emissions are notably smaller than cars and HGVs, meaning that a variation in van reduction across scenarios would have a small effect on overall emissions.

⁴ Relative to the baseline in a given year. This means that the efficiency measures will have a decreasing effect on absolute emissions as the fleet transitions to ZEV vehicles, where efficiencies will translate to less demand on the electricity grid.

⁵ Large cars are defined as a collection of the Euro Car Segments categorisation, which can be found here: https://en.wikipedia.org/wiki/Euro_Car_Segment. This is used to allow a mapping to the categorisation used in COPERT for speed-emission curves. While these measures seek to target conventional vehicles in the short-term, smaller electric vehicles also support reduced demand on electricity in the medium and long-term.

⁶ This would bring 2025 demand to around a 4%-5% increase on total vehicle kilometres travelled in 2018.

⁷ This would bring 2030 demand to anywhere between -5% and +1% of 2018 levels.

Chapter 5 – Policy analysis

Within the previous chapters, we have:

1. introduced our four Future Travel Scenarios;
2. explained how they have been used to estimate future emissions (our baseline trajectories);
3. identified the difference between future emissions under each scenario and those that would be required under our Decarbonisation Trajectory (known as the Policy Gap);
4. identified the broad-brush level of policy commitment required (our Decarbonisation Pathways) to bridge those Policy Gaps and achieve our Decarbonisation Trajectory.

This chapter provides further detail about the measures required to deliver on these policy commitments and the relevant roles and responsibilities of government, our Partners and TfN in implementing them. The measures are grouped into the following themes:

1. Zero Emission Vehicles (ZEVs)
2. Demand Management
3. Improvements to conventional vehicle efficiency

Each theme is accompanied by a high-level summary of policies and actions that our evidence suggests will help achieve the changes set out in Table X in chapter 4. This includes high-level analysis of the broad scale of policy commitment required under each theme, covering quantified and costed policies where possible. It also includes some high-level narrative on the distribution of responsibility across the themes:

1. **TfN:** Measures that could be effectively undertaken at a regional scale or a Sub-national Transport Body level of governance and therefore led or facilitated by TfN.
2. **Government:** Actions required by national government that should be brought forward in the Transport Decarbonisation Plan, including additional national policies and appropriate devolution of funding and powers.
3. **TfN Partners:** Measures that might be employed by our partners, subject to receiving sufficient national funding, recognising that each place within our region will have different decarbonisation timescales and different geographies, demographics and patterns of passenger and freight demand that require a bespoke place-based approach.

Further details of these packages of policies is provided in Annex A – Detailed policy recommendations.

It's important to note that the measures identified for consideration at a local level are intended as guidance for our partners to aid their consideration of the most effective mix of measures and actions, applicable to their individual places. We recognise that local policy makers are best placed to understand what will and won't work, for the communities within their own areas.

In recognition of the unique landscapes underlying each scenario, the magnitude of change varies across scenarios. This is especially the case for demand reduction, but applies across most other measures, where the gap between baseline projections and required decarbonisation changes (such as ZEV sales) is larger in some scenarios than others. This means our analysis has allowed us to develop supporting policy recommendations that can be adapted and implemented differently, depending on the evolution of future travel trends.

1. Zero Emission Vehicles (ZEVs)

		2025	2030	2035	2040	2045
ZEV share of sales	Cars	55%	100%	100%	100%	100%
	Vans	40%	100%	100%	100%	100%
	HGVs	26%	44%	72%	100%	100%
BEV high mileage Co2 reduction	Cars	20%	20%	20%	20%	20%
Public transport Co2 reduction on baseline	Bus	15%	40%	70%	90%	100%
	Rail	0%	25%	75%	100%	100%

As long as vehicles use fossil fuels, it will not be possible to achieve near-zero emissions in the North's surface transport network. The typical life of a car is around 15 years, with some lasting longer in the fleet, meaning it will take roughly this long for ZEV vehicles tip the balance and deliver the deep emissions reductions required to meet decarbonisation targets. It is therefore critical to introduce policies that will rapidly increase ZEV uptake as soon as possible.

This section describes the policies required to meet the ambitious targets outlined above.

ZEV cars and vans

In November 2020, the Government announced the phase-out of the sale of new petrol and diesel cars and vans by 2030, and hybrid cars and vans by 2035. Our analysis suggests that we need to go further, with a ban on petrol, diesel and hybrid car and van sales by 2030 and an ambitious uptake of ZEV cars (55% of sales) and vans (40% of sales) by 2025.

In order to achieve this, all consumers must have sufficient access to charging infrastructure. This will require a significant increase in the provision of public charging, including rapid charging hubs. Consumers will also need to be discouraged from purchasing internal combustion engine vehicles (ICE) cars and vans. From the mid-2020s, zero-emission cars and vans are expected to reach cost parity with ICE vehicles¹, at which point fiscal policy should shift towards substantially increasing the cost of buying and using ICE vehicles. In addition, policies that can encourage the uptake of ZEVs for high mileage applications, such as taxis, could result in around a 20% reduction in car CO₂.

ZEV HGVs

While the technology for ZEV cars is well advanced, there is more uncertainty about the optimal technology for ZEV HGVs, making it a challenge to meet our ambitious sales targets for ZEV HGVs.

Technology demonstration projects would provide essential evidence for the feasibility of different HGV technologies and the necessary infrastructure to support them. Off the back of this evidence, there is an opportunity to leverage regional partnerships in the North to purchase ZEV HGVs in bulk.

¹ Kate Palmer, James E. Tate, Zia Wadud, John Nellthorp, Total cost of ownership and market share for hybrid and electric vehicles in the UK, US and Japan, Applied Energy, Volume 209, 2018, Pages 108-119, ISSN 0306-2619, <https://doi.org/10.1016/j.apenergy.2017.10.089>.

This would help draw significant numbers of vehicles into the region (with potential cost savings) and send a message to original equipment manufacturers (OEMs) that the demand is there.

ZEV buses

Electric buses are increasingly being trialled and rolled out across towns and cities, spurred on by the need to improve air quality as well as reduce carbon emissions. In general, these buses are being used for shorter routes where buses have more recharging opportunities, and longer routes will likely require technological improvements for electric buses, or hydrogen options.

Decarbonising rail

Route electrification is the most efficient way of reducing rail emissions in the long-term. Not only does it remove tailpipe emissions on those routes, but it supports the use of bi-mode trains on other routes. Overhead electrification also helps to improve rail journey times and reliability, making rail a more attractive mode of transport and encouraging mode shift. Improvements to rail services are covered in more detail in the Demand Management section below.

Building on Network Rail's Traction Network Decarbonisation Strategy (TNDS)², a regional plan should be formulated laying out the order and timing in which higher-density routes will be electrified and identifying routes where alternative technology is a permanent solution. The current rail fleet in the North is of mixed vintage. There is scope to develop a plan that cascades rolling stock as electrification develops to push out the worst polluters. Electric-only trains are a known quantity and low-risk, but other ZEV technologies (battery-electric, battery and hydrogen) will need further testing to understand their viability²:

1. Battery technology is emerging rapidly, but range is constrained, and it requires charging infrastructure.
2. Hydrogen presents risks around the quantity needed and the knock-on impacts on operational costs (fuelling time and capacity to carry fuel needed).

ZEV policy in action: In 2020, Norway became the first country in the world to see the sale of electric cars overtake those of petrol, diesel and hybrid vehicles. Battery electric vehicles (BEVs) sales made up over 54 per cent of all new cars sold in 2020, up from over 42 per cent in 2019. Norway is currently leading the way in EV ownership in Europe. By 2025, the country aims to ban the sale of all fossil fuel cars. Oslo launched its first municipal EV charging infrastructure program in 2008, providing incentives including free parking for EVs, exemption from a congestion tax, and exemptions from Low Emission Zone (LEZ) fees. Only zero tailpipe emission taxis will be able to operate in the city from 2023. The city is deploying fossil free public transport from 2020 and is considering a ban on petrol and diesel cars within the city centre by 2024

ZEV policy in action: In Sweden, an increase in EV usage can be traced to the government's recently adjusted incentive scheme that sees a tax increase for vehicles with high emissions. In addition, cars with low CO₂ emissions can receive up to €5,700 as a grant.

² Traction Decarbonisation Network Strategy, Interim Programme Business Case, Network Rail (2020)

Quantifying the policy commitment – ZEVs

Global action to build new markets for Electric Vehicles, as well as wider investment in battery technology and manufacturing processes, has led to significant reductions in the costs of ZEV cars and vans. However, to achieve the ambitious levels of uptake in our pathway, further policy commitment will be required in the 2020s. As noted above, a combination of policies that help to differentiate the upfront costs of new ZEV and ICE vehicles will be required, as well as a coherent and comprehensive approach to the electric chargepoint network, involving a mixture of public and private investment. ZEV HGVs will require a similar combination of investment in vehicles and infrastructure, with public funding required to accelerate the transition. Decarbonising rail will require primarily public investment and infrastructure and rolling stock, but there are significant wider public benefits to these investments that offset some of these costs. Table X summarises our high-level quantification of the policy commitments and investments required for the North to 2030.

Area	High-level quantification of policy commitment for the North (2020 prices)	Notes on implementation and public/private investment split
ZEV cars and vans	<p>To reach our 2025 pathway, grants or equivalent tax differentials for new ZEVs need to continue until around 2022, totalling around £210m in 2021 and £590m in 2022 for the Northern car and van fleet³.</p> <p>Around £230m annual investment in Northern charging infrastructure is needed by 2025, and around £350m by 2030⁴. This will deliver around 2.4 million installed chargepoints across the region by 2030.</p>	<p>Support for vehicles could be focused on taxation (e.g. VED), with minimal or modest additional grant funding.</p> <p>Some public investment is needed for charging infrastructure, but a proportion could be delivered by private investment if the Government develops new markets and innovative regulatory regimes.</p>
ZEV HGVs	<p>Grants or equivalent tax differentials for ZEV HGVs need to be introduced in the next few years, ramping up to a total of around £2m in 2025 and £50m in 2030 for the Northern HGV fleet⁵.</p> <p>Around £110m cumulative investment in Northern HGV charging and refuelling infrastructure is needed by 2030⁶.</p>	<p>More significant public investment in vehicles and infrastructure likely to be needed initially, but private investment could take over in the 2030s. An even fleet share of electric and hydrogen fuelled ZEV HGVs is assumed in these costing estimates, in line with CCC assumptions.</p>
Decarbonising rail	<p>The Network Rail TDNS interim business case suggests that a zero-emission rail network by 2040 could have a net present value ranging from a £4.4bn net cost to a £480m net benefit, with much of this wide range due to uncertain technology costs. This is a whole UK figure as Network Rail did not split these costs out by region. TfN</p>	<p>Mostly public investment required, but there are also significant wider public benefits, such as faster, more reliable journeys.</p>

³ Cost outputs are developed using Element Energy's car and van choice model ECCo, developed for DfT

⁴ Calculated by Element Energy for TfN using a method developed by the ICCT, which can be found here: <https://theicct.org/publications/charging-gap-UK-2020>

⁵ Cost outputs are developed using Element Energy's truck choice model, developed for CCC

⁶ Data taken from Ricardo analysis for the CCC and scaled to match TfN area, available at: <https://www.theccc.org.uk/publication/zero-emission-hgv-infrastructure-requirements/>

	will work with Network Rail to estimate Northern figures in a future phase of work.	
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Scenario-specific considerations

Our Future Travel Scenarios allow us to consider how policy should respond to different outcomes in society and the economy that would affect decarbonisation progress. The considerations below help us to plan for an uncertain future, whether society ends up closer to one of the scenarios or somewhere within the range of the scenario outcomes.

Scenario	Scenario considerations for implementation of key areas	Secondary measures (more detail picked up in local measures below)
Just About Managing	Population more urbanised. People less embracing of technological and societal change.	Stronger taxation and subsidy signals may be needed to incentivise the purchase of ZEVs, given the resistance to change.
Prioritised Places	Population less urbanised. People embrace societal change but are less receptive to technological change. Additional policy levers may be needed to stimulate ZEV vehicle uptake.	Increased population in rural areas will need to be factored into the regional charging infrastructure strategy. For example, support should be introduced to help car parks in remote locations to provide more reserved EV parking spaces over time.
Digitally Distributed	Population more suburbanised. Population embraces technological change and are receptive to using a shared service-based transport system, although are less receptive to societal changes.	More suburban living could allow more people to charge vehicles at home off-street, altering the requirement for public chargepoints. Charging needs to be integrated with emerging use-models for Autonomous Vehicles, which are adopted more rapidly in this scenario. Growth in out-of-town employment will need to be supported with appropriate charging infrastructure.
Urban Zero Carbon	Population significantly more urbanised. Population receptive to both technological and societal change.	Very few people will have on-street parking for overnight re-charging, so strategy needs to be more focussed on rapid re-charging. Electric car-clubs may be a more viable choice for many.

Recommendations

This section sets out our headline recommendations on ZEVs.

Firstly, we focus on what TfN can do. As these proposed actions and activities have been identified through our analysis of policies likely to be needed to bridge the *policy gap* between our baseline scenarios and Decarbonisation Trajectory, they have been categorised as ‘Policy Gap Actions’ (PGAs).

We have then turned to the areas the Government should prioritise in its Transport Decarbonisation Plan and subsequent actions, and finally look at recommendations for our partners to consider. Further detail is provided in Annex A – Detailed Policy Recommendations.

TfN – What actions should we prioritise?

Road vehicles

PGA1: Develop a pan-northern ZEV infrastructure plan to ensure trans-boundary road trips are considered, factoring in interoperability across the region and optimal locations for high-power charging hubs on the Major Road Network, with input from Local Authorities and the Distribution Network Operators (DNOs).

PGA2: Work with Local Authority partners and Highways England to facilitate large ZEV truck trials in high traffic corridors in the North.

PGA3: Work with Local Authorities and freight stakeholders to help aggregate large orders of ZEV vans and trucks across the North and overcome demand shortages.

Rail

PGA4: Through the Northern Powerhouse Rail programme, support the government and Network Rail in identifying appropriate routes for electrification and associated implementation.

PGA5: Work with Network Rail and train operating companies to ensure service patterns are based around the progression of electrification and minimising the use of diesel-only trains.

PGA6: Influence Government to trial alternative technology freight locomotives in the North.

PGA7: Work with Network Rail to ensure there is sufficient capacity to allow freight traffic to run directly and with minimal dwell times, reducing emissions from existing diesels.

National Government – What actions are needed in the Transport Decarbonisation Plans and Subsequent Actions?

Road vehicles

1. Strengthen the existing policy to phase-out ICE car and van sales by 2030 to include hybrids.
2. Increase taxes on new ICE vehicles from the early 2020s, with rates escalating in line with emissions intensity.
3. Develop a coherent and comprehensive strategy for charging infrastructure, defining a role for local and regional bodies, providing public funding where appropriate and developing a regulatory regime that enables the private sector to invest and ensure interoperability.
4. As more ZEV HGV models become available in the 2020s, introduce a system of strong grants and tax incentives.
5. Fund large ZEV HGV trials in high-traffic corridors.
6. Implement measures to rapidly increase supply of ZEV models. This could include measures that stimulate domestic manufacture, which also have the potential to drive green growth in the North (see Chapter 8).

Rail

1. In partnership with Network Rail, identify and fund a core network for electrification with the highest traffic density, then prioritise secondary, lower density routes where alternative technology will be the permanent solution.
2. For routes where alternative technology is the long-term solution, provide funding to procure new rolling stock.

3. In partnership with delivery bodies, work with freight operating companies to understand the need for incremental electrification of freight.
4. Support freight operating companies and rolling stock builders in the development of alternative technology freight locomotives.

Local Partners – Where should local action be prioritised?

General

1. Develop a model for delivery and maintenance of electric vehicle charging infrastructure, covering rapid hubs, on-street charging, public parking spaces, and council fleets. Initially proactive bidding for Government funds will be needed, but over time private sector investment will support this, subject to an effective national and local regulatory regime.
2. Implement a common procurement framework for infrastructure across administrative areas to encourage economies of scale and interoperability across the region.
3. Carry out community engagement to increase understanding of EVs and EV infrastructure.
4. Implement policies to prioritise ZEV shared transport, such as car share and car clubs.
5. Collectively adopt taxi licensing policies that require new vehicles to be zero-emission. This will need to be coupled with provision of charging infrastructure at taxi ranks.
6. Aggregate purchases of ZEV vans and trucks across the North (supported by TfN).
7. Engage with bus operators to set targets and standards for rapid roll-out of ZEV buses.

In smaller towns, villages and dispersed communities:

8. Incentivise EV uptake (including electric bikes) and development of home charging infrastructure through direct funding and awareness raising (e.g. telematic tests, EV trials).
9. Develop charging infrastructure at rural tourist spots to counter range anxiety. These should be developed in such a way to avoid unsustainable traffic levels within protected rural areas (e.g. National Park park & ride schemes).

2. Demand management

	2025	2030	2035	2040	2045
Reduction in distance travelled relative to baseline growth	Cars	1-7%	3-14%	3-14%	3-14%
	Vans	5%	10%	10%	10%
	HGVs	3-5%	11-15%	6-15%	6-15%

As it will take time for new ZEV vehicle sales to translate into a substantial proportion of the fleet, it is essential to shift journeys away from private cars to sustainable modes and find ways to avoid journeys. In the long term, as the fleet becomes predominantly electrified, even if running on energy generated through renewable sources, a ZEV will still have a significant carbon footprint through the emissions embodied in its manufacture.

Travel demand reduction also provides a range of other co-benefits, even with a predominantly electrified fleet, such as improving local air quality and safety whilst reducing congestion and avoiding potential transport related social exclusion issues. A shift to active travel also has the potential to improve the physical and mental wellbeing of users. These demand reductions will require significant behavioural change – from a culture focused on personal car use to one that

embraces shared mobility and active travel – and a comprehensive set of policies and supporting infrastructure to facilitate it.

There is a large and growing evidence base on the policies required to achieve this behaviour change⁷. Here we summarise the key areas:

1. Encouraging mode shift to walking, cycling, micro-mobility and public transport
2. Disincentivising car use and avoiding travel
3. Encouraging the uptake of shared mobility
4. Improving freight efficiency
5. Ensuring transport and land-use planning processes encourage sustainable choices

Encouraging mode shift to walking, cycling, micro-mobility and public transport

To achieve significant mode shift, investment will be required in bus, rail and cycling infrastructure to improve journey times and quality and ensuring these networks are accessible and affordable to all. Funding must be made available for bus and rail, including: investment to deliver improved journey times and reliability; targeted reduction and flexibility in fares; network expansions; and fleet improvements. Marketing and engagement must also be used to rebuild public confidence in the safety and value of public transport following the pandemic. Increasing uptake in active travel will require policies and investments that promote comfort, safety and convenience. Local planning policies can play a role, for example by protecting pedestrian use of pavements and supporting active commuting by requiring workplaces to provide appropriate facilities. Policies should also promote safe and accessible use of e-bikes and scooters for longer distance trips.

Both local and national planning policy should place greater emphasis on the location of new development in relation to existing and proposed public transport hubs. New developments without easy access to public transport should consider how appropriate alternatives are incorporated (e.g. shared transport solutions). A related approach is to remove the need to travel long distances by creating ‘15- or 20-minute neighbourhoods’, where residents can meet most needs within a short walk or cycle and use public transport to access other services.

Disincentivising car use and avoiding travel

In addition to making alternative options more attractive, policies that make car travel less attractive or encourage people to avoid travel altogether should be part of the mix. These policies can also generate revenue that can be reinvested in sustainable transport solutions. These measures will be particularly important given the low running costs of Electric Vehicles, which will lead to significant demand growth and make mode shift more difficult if appropriate price signals are not introduced.

Road user charging could be one option to manage demand as a complement to and eventual replacement for fuel duty. This could include measures such as congestion charging and road tolls. Smart technology solutions should be used to target charges at the most congested times of day, the most polluting vehicles and at discretionary car trips, rather than essential travel, for example by key workers. Time-of-day and emissions-based pricing would have the added benefits of improving network efficiency and incentivising the purchase of ZEVs.

Parking policy is another important tool to manage demand for car travel. This can include reducing parking supply in urban centres and introducing schemes like a Workplace Parking Levy (see **example**

⁷ See for example:

- <https://www.gov.uk/government/publications/switching-to-sustainable-transport-a-rapid-evidence-assessment>
- <https://www.transportforqualityoflife.com/policyresearch/>
- <https://www.local.gov.uk/decarbonising-transport>

box X). City centre land occupied by parking is often valuable and can be repurposed, for example as cycling infrastructure or green space. Related policies that restrict car access, such as Low Traffic Neighbourhoods, can also be effective at reducing car use and car ownership.

Working from home has become a necessity for many during 2020, and this has been linked to a decrease in car traffic. Ongoing home-working after the pandemic will lead to fewer commuter trips, but evidence is mixed on the net carbon impact of this trend due to travel activities that can replace commuting or using more energy per person in the home setting compared to the office. On balance, evidence suggests there is likely to be an energy saving in most circumstances⁸ and home-working should be supported, particularly where it provides other benefits to quality of life.

Encouraging the uptake of shared mobility

Shared mobility refers to a number of different services that make low or zero emission vehicles accessible to people. They can involve lift sharing, car hire, car clubs, demand-responsive bus services, taxis, and cycle and e-scooter hire schemes. Widespread availability of such services can reduce the need to own a car, and lower car ownership is strongly correlated with lower car use⁹.

Use of shared vehicles can be encouraged through the provision of dedicated car club parking spaces combined with stringent parking standards for new development. The use of planning obligations and the Community Infrastructure Levy can fund shared vehicle provision in new developments. Similar approaches can be adopted with cycle hire schemes, and the UK e-scooter trial offers an opportunity to increase the impact of such schemes by incorporating new forms of mobility.

Demand-responsive bus services are more convenient for many travellers than traditional bus services in that they are not bound to a fixed route or timetable. Supporting the provision of these services would help reduce car dependency and complement established public transport networks. This may be particularly important in settings with lower population density, where traditional public transport services need to be heavily subsidised.

Mobility-as-a-Service (MaaS) can encompass the benefits of all these modes, providing a platform to access different mobility solutions. Such services offer reduced cost, low-carbon options in areas with low EV home-charging potential, linking public transport and improving accessibility and reliability. ‘Mobility Credits’ could be used as an incentive to trade older, more polluting private cars for public transport or shared vehicle use.

Improving freight efficiency

Freight operators are already strongly incentivised towards efficiency, as it helps them to increase their competitiveness. However, some opportunities are not being taken due to market failures, such as a lack of information, an inability to coordinate between operators, or a consumer willingness to pay for fast deliveries at the expense of energy efficient outcomes. These barriers can be overcome through a number of policies described below.

Road-user charging is one way to incentivise operators to use vehicles more efficiently. By increasing the unit cost per mile, there will be an additional incentive to reduce vehicles running empty which will improve vehicle efficiency and make rail a more financially competitive option. This would be complemented by other freight efficiency measures, where information and technology alternatives help prevent policy costs being passed on to consumers.

⁸ A systematic review of the energy and climate impacts of teleworking. Hook et, al, ERL (2020)

⁹ <https://www.creds.ac.uk/shared-mobility-where-now-where-next/>

'Just-in-time' deliveries and next day deliveries can significantly reduce opportunities for freight consolidation. A campaign to encourage shippers to offer a green shipping option as standard could demonstrate best practice, whilst lower prices for, and the provision of information about, green shipping options could influence consumer behaviour. Other 'green' shipping practices include deliveries in low traffic periods and encouraging consumer uptake of local community drop off/pick up points, reducing emissions due to congestion and improving last-mile delivery efficiency.

Accurate and sharable data on goods and vehicles could allow optimisation between companies that reduces empty running of vehicles. Data formats and sharing protocols must be designed to allow this sharing without risk of prosecution under anti-collusion regulation. This sharing would also enable government and local planning bodies to track freight data to make evidence-based decisions about freight optimisation and consolidation centre planning.

Ensuring transport and land-use planning processes encourage sustainable choices

The transport and land-use planning process can have a substantial impact on the relative investment in car use versus more sustainable modes. Several of the policies outlined above are determined by this process but in this section, we focus on the processes themselves.

Augmented project appraisal processes could encourage a reduction in demand through a stronger focus on projects' environmental impacts. This would see a more rigorous assessment of a transport project's impact on carbon, air quality and the urban realm, as well as the whole life carbon impacts of infrastructure development and of manufacturing cars. There is also an opportunity to improve integration between public health and transport. Health providers could disseminate resources to encourage physical activity to replace short car trips, and land-use planning could be integrated with behavioural change programmes to reduce carbon.

Scenario-specific considerations

Scenario	Scenario considerations for implementation of key areas	Secondary measures (more detail picked up in local measures below)
Just About Managing	Population more urbanised. People less embracing of technological and societal change.	Slow progress in ZEV and public transport uptake may mean more restrictive additional measures on car travel.
Prioritised Places	Population less urbanised. People embrace societal change but are less receptive to technological change.	Regulation to support rural on-demand MaaS services. Enabling home-working in remote areas by ensuring full fibre internet access. Implement planning policy to support localisation of travel needs. Direct mobility credit schemes at communities in smaller towns with fewer public transport options, and at those living in areas of low EV home-charging capability.
Digitally Distributed	Population more sub-urbanised. Population embraces technological change and are receptive to using a shared service-based transport system, although are less receptive to societal changes.	With a more distributed population, e-bikes in particular, may be an effective way to increase the uptake of active travel modes for those living in more dispersed communities. Supporting strategic park-and-ride to avoid CAVs congesting urban areas. Implement policies to promote CAVs in a way that increases the coverage of MaaS systems, particularly to connect town and cities.

Urban Zero Carbon	Population significantly more urbanised. Population receptive to both technological and societal change.	Micro-mobility options, such as e-scooters and e-bikes, could play an important role in last mile journeys for those living in areas of low parking provision. Implement planning policy to support localisation of travel needs. Supporting strategic park-and-ride to enable sustainable access for rural communities into growing cities.
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Demand Management policy in action: Nottingham's Workplace Parking Levy (WPL), introduced in October 2011, is an annual charge of £415 levied on all employers within Nottingham City Council's administrative boundary which provide 11 or more liable workplace parking bays. Since 2012 £64 million has been generated which has been reinvested in public and sustainable transport.

Nottingham implemented the UK's first bus lane that also allows access by ULEVs. For this scheme an 'Ultra Low Emissions Vehicle' (ULEV), is a vehicle that emits less than 75g of carbon dioxide (CO₂) per kilometre travelled, with a capability of travelling a minimum range of 10 miles with zero CO₂ emissions. This is based on the HM Treasury Company Car Tax definition.

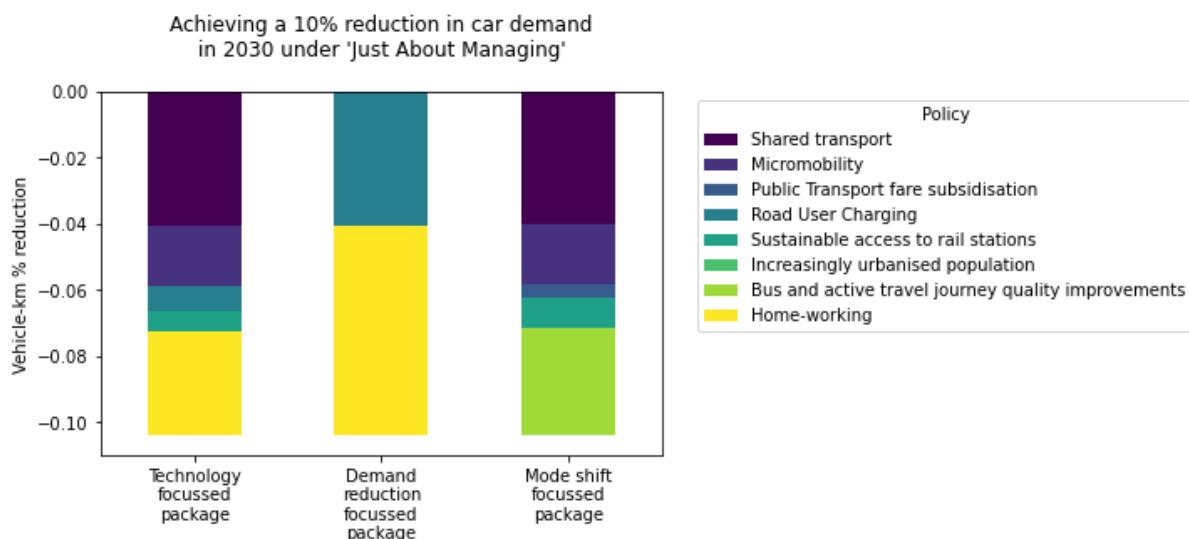
Nottingham's 'try before you buy' scheme aimed at Nottingham's taxi drivers has contributed to Nottingham having the biggest fleet of ULEV hackney taxis outside London.

Quantifying the policy commitment – Demand management

Our analysis suggests that between a 3% and a 14% reduction in car distance travelled is required relative to baseline growth. This range is due to the fact the baseline varies between each Future Travel Scenario. To understand what scale of intervention might be needed to achieve such a reduction, we have modelled three illustrative policy packages to bridge the gap in the *Just About Managing* scenario, which requires around a 10% reduction by 2030. The results are shown in Table X and Figure X below.

Policy	Technology focussed package	Demand reduction focussed package	Mode shift focussed package
Shared transport	There is bus and shared transport connectivity across all flow types	No change	There is bus and shared transport connectivity across all flow types
Micro-mobility	Micro-mobility represents 20% of all active travel with an average speed of 20 kilometres per hour	No change	Micro-mobility represents 20% of all active travel with an average speed of 20 kilometres per hour
Public Transport fare subsidisation	No change	No change	20% lower fares for intra-sector trips and 10% lower fares for other flow types

	An average additional pence per km charge of 0.1ppkm across all zone pairs	An average additional pence per km charge of 0.5ppkm across all zone pairs	No change
Road User Charging			
Sustainable access to rail stations	20% lower perceived costs for access and egress	No change	30% lower perceived costs for access/egress
Increasingly urbanised population	Most growth in urban and sub-urban areas	Most growth in urban and sub-urban areas	Most growth in urban and sub-urban areas
Bus and active travel journey quality improvements	No change	No change	20% lower bus generalised journey time (GJT) for intra-sector trips and 20% lower GJT for walk and cycle trips
Home-working	Individuals work from home 2 days a week (in occupations where it is possible) and there is a 10% reduction in intra-sector business trips	Individuals work from home 3 days a week (in occupations where it is possible) and there is a 20% reduction in intra-sector business trips	Individuals work from home 1 day a week (in occupations where it is possible)



This analysis shows that policy changes of a significant scale will be required to achieve the scale of demand reduction in our pathway. Choices are available to policy makers who prefer different types of intervention but leaving out any particular policy lever will mean the need to implement more radical policies in other areas. Our view is that a balanced approach that implements policies in all of these areas will be most likely to succeed.

The carbon impacts of Northern Powerhouse Rail: Northern Powerhouse Rail (NPR) is a large-scale programme of investment in the North's rail network between six major cities, the North's largest airport and other significant economic centres. NPR is a key element of TfN's Investment Programme, delivering substantial changes in journey time and frequency using fully electrified rail services. We estimate NPR will remove around 58,000 car trips per day from the road, or around 590 million car kilometres per year. The impact of this mode shift on carbon will vary depending uptake of ZEV cars when NPR is fully open in around 2040. Taking mode shift and electrification together, we estimate that NPR could reduce Northern car and rail emissions by around 1-2% in 2040, depending on the scenario.

Impacts in 2040	Carbon reductions as a result of NPR (tonnes CO ₂)	
Scenario	Just About Managing	Urban Zero Carbon
Reductions from mode shift	-9,000	-3,000
Reductions from rail electrification	-20,000	-20,000
Total reductions	-29,000	-22,000
Total annual North car and rail emissions (2040)	17,000,000	2,500,000
Percentage reduction in emissions due to NPR	-1.2%	-2.1%

Further reductions could be possible, given that NPR will encourage more housing and commercial development in highly accessible areas next to rail hubs, but more work is needed to quantify these impacts. Further work is also needed to quantify the embodied emissions of NPR infrastructure, which will offset some of these reductions.

Recommendations

This section sets out our headline recommendations on Demand Management.

Firstly, we focus on what TfN can do, then turn to the areas the Government should prioritise in its Transport Decarbonisation Plan and subsequent actions, and finally look at recommendations for our partners to consider. Further detail is provided in Annex X – Detailed Policy Recommendations.

TfN – What actions should we prioritise?

Mode-shift

PGA8: Develop and implement comprehensive plans for the regional public transport network, such as Northern Powerhouse Rail and wider improvements to the rail network.

Reducing car travel

PGA9: Develop an evidence base on the extent to which less work-related travel has a detrimental effect on productivity and agglomeration to understand whether home-working can be consistent with TfN's vision for a transformed Northern economy.

Shared mobility

PGA10: Use our role on within the Rail North Partnership to promote shared mobility at train stations, including car share, car club, cycle hire and e-scooter schemes.

PGA11: Provide evidence and strategic support to partners to identify opportunities for shared mobility.

Freight efficiency

PGA12: Work with Government to support regional coordination of measures to improve logistics efficiency, including consolidation centres, mode shift to rail and information democratisation schemes.

Planning policies

PGA13: Influence government to develop appraisal guidance that includes the full impacts of transport projects on carbon.

National Government – What actions are needed in the Transport Decarbonisation Plans?

Mode-shift

1. Work with train operating companies to implement a targeted reduction in rail fares and increase integration and flexibility of ticketing systems.
2. Provide a substantial and consistent funding stream to Local Authorities to improve public transport and active travel networks.

Reducing car travel

3. Develop a coherent plan for taxing and pricing car travel that accounts for reduced Fuel Duty revenues and incentivises key outcomes such as reduced overall car travel, more efficient road network operation and uptake of ZEVs.
4. Support employers to roll-out home working, flexible working and remote working hubs.

Shared mobility

5. Ensure Local Authority funding and planning regimes support share mobility solutions alongside traditional public transport options.
6. Require employers to report on emissions from all employee travel to encourage a shift towards vehicle sharing.

Freight efficiency

7. Require shippers to provide consumers with information on emissions from different shipping options and encourage uptake through information and pricing.
8. Fund a project to develop common data collection methods, formats and sharing platforms that overcome competition and privacy barriers, and enforce data reporting to government.
9. Establish a framework for consolidation centre planning as well as funding and support for Local Authorities to perform local area assessments.
10. Support the licensing of high capacity vehicles on specific roads (major motorways) for specific users where the benefits are clear.

Planning policies

11. Use the National Planning Framework to promote ‘15/20-minute neighbourhoods’.
12. Develop appraisal guidance that includes the full impacts of transport projects on carbon.

Local Partners – Where should local action be prioritised?

Mode-shift

1. Use marketing policies to re-build confidence in the safety and value of public transport.
2. Subject to Government funding, invest in bus and light rail networks to and offer improved journey quality, accessibility and cheaper fares to passengers.
3. Implement policies to enhance dedicated cycle networks, low-traffic neighbourhoods, and activities to promote behaviour change.
4. Implement policies to promote safe and accessible use of e-bikes and e-scooters.

Reducing car travel

5. Roll out parking policies to reduce congestion and make space for sustainable infrastructure.
6. Consider charging policies such as clean air zones or congestion charging, particularly where and when sustainable transport modes are a viable alternative option.

Shared mobility

7. Utilise planning contributions from new developments to enable shared vehicle provision.
8. Develop mobility-as-a-service (MaaS) platforms and mobility credit systems, to link public transport journey stages and improve accessibility and reliability.
9. Support the provision of demand-responsive bus services to complement existing networks.
10. Trial and roll out cycle hire / e-scooter sharing schemes.

Planning policies

11. Use local planning policy to promote '15/20-minute neighbourhoods', prioritise development close to public transport hubs and encourage car-free or car-lite development.
12. Consider introducing a Workplace Parking Levy, utilising lessons learnt from Nottingham.
13. Support and facilitate the roll out of car-free zones and streets.
14. Develop park-and-ride sites with integrated EV charging infrastructure and cycle parking.
15. Implement planning policies that support the development of freight consolidation centres.

3. Improvements to conventional vehicle efficiency

		2025	2030	2035	2040	2045
Conventional vehicle efficiency Co2 reduction	Cars and vans	3.6%	3.6%	3.6%	3.6%	3.6%
	Artic HGVs	22%	22%	22%	22%	22%
	Rigid HGVs	13%	13%	13%	13%	13%
Share of car sales	Large cars	27%	22%	17%	10%	10%

In their Sixth Carbon Budget, the Climate Change Committee (CCC) lay out several measures that can reduce emissions from ICE vehicles. Our analysis suggests that these measures must be taken up to maximum effect from 2025.

Cars and vans

The CCC estimated that full enforcement of 70mph speed limits would reduce overall fuel consumption by 2% and 60mph speed limits by 7%. Given the journey time disbenefits and associated political difficulties in reducing speed limits, we have opted to include only the 2% from speed limit enforcement in our pathways. Fuel-efficient driving styles, supported by eco-driver

training, can improve fuel efficiency by 8% for up to 20% of drivers who adopt them.¹⁰ Taken together, enforcing speed limits and eco-driving could reduce car and van emissions by 3.6%.

Shifting to smaller ICE cars

Large cars now make up nearly one third of new car sales in the North. As emissions intensity for these vehicles is higher than smaller cars, there is an opportunity to reduce emissions by discouraging the purchase of large ICE vehicles in the short-term. This can be achieved through changes to taxation on new vehicles, such as Vehicle Excise Duty, which the Government is considering restructuring to increase the upfront costs on the most polluting vehicles¹¹.

HGVs

More fuel-efficient driving can also support CO₂ reductions in HGVs. Alongside more aerodynamic designs and retrofitting of drag reduction devices, these measures can offer efficiency savings up to 13% for a rigid HGVs and 22% for articulated HGVs.

Scenario-specific considerations - Improvements to conventional vehicle efficiency

The roll out of measures to improve conventional vehicle efficiency will be similar in all scenarios, with the main differences being driven by the extent to which Autonomous Vehicles improve the energy efficiency of driving styles, which could vary between scenarios.

Quantifying the policy commitment – Improvements to conventional vehicle efficiency

We have not quantified the policy commitments required in this area due to a lack of available data or analytical tools to undertake these calculations, particularly at the regional level. We will consider further analysis of this area in a future phase of work.

Recommendations

This section sets out our headline recommendations on improving conventional vehicle fuel efficiency. Further detail is provided in Annex A – Detailed Policy Recommendations.

TfN – What actions should we prioritise?

PGA14: Work with partners to increase public awareness of fuel-efficient driving styles and the associated environmental and financial benefits.

National Government – What actions are needed in the Transport Decarbonisation Plans?

1. Ensure an ambitious post-Brexit regulatory regime on new vehicle CO₂ emissions, aligned to UK carbon budget commitments.
2. As per the recommendations above, ensure Benefit-in-Kind and Vehicle Excise Duty rates on all ICE vehicles escalate in line with emissions intensity.
3. Roll out nationally funded eco-driving training schemes, implemented through workplaces in relation to freight operators or organisations with large company car fleets.
4. Support smaller freight operators to implement other efficiency technologies, such as aerodynamic attachments.
5. Ensure new vehicle regulations use technology solutions to support efficient driving styles.

Local Partners – Where should local action be prioritised?

¹⁰ In addition to more fuel-efficient driving, other benefits of eco-driver training include reduced mechanical wear on vehicles and fewer road accidents.

¹¹ <https://www.gov.uk/government/publications/vehicle-excise-duty-call-for-evidence>

1. Extend existing demand management and pollution abatement measures (e.g. Ultra Low Emission Zones) to consider fuel efficiency of private cars, so as to tackle the trend towards driving larger, heavier private vehicles (e.g. SUVs).

Co-Benefits and Potential Adverse Consequences

Whilst measures that decarbonise transport will help to reduce the level of climate change and the effects of global warming on both our global and local environment, it is important to understand how those measures might affect our local environment and local communities in other ways. The co-benefits and also potential adverse consequences of these measures are important considerations when developing the policy mix and timescales relevant to the different place typologies in the North.

Alongside identifying the baskets of policy measures that partners might employ within their own action plans, Annex A – Detailed Policy Recommendations, also provides commentary around the potential for unintended or secondary effects, both beneficial and adverse, that are associated with each of the main transport decarbonisation policy levers. These are summarised within Table X.

Table X: Summary of risks and co-benefits associated with key transport decarbonisation policy levers

Policy Area	Overarching Policy Lever	Potential Co-Benefits	Potential Adverse Consequences
Low Emission Vehicle Uptake	Policies to encourage ZEV/CAV take up.	Local air quality benefits initially. Noise benefits. Lower operating costs benefitting particularly those leasing vehicles. Trade and investment benefits (clean growth opportunities). In relation to Connected and Autonomous Vehicles (CAVs): Accessibility benefits for those unable to drive. Increased productive time for those previously driving. Potential to reduce congestion through traffic flow optimisation and re-routing. Increased potential for ride-sharing.	May perpetuate long term local air quality issues if EVs are chosen over shared and active modes. Maintains congestion levels. Potential to increase TRSE for those areas with low home charging potential and higher purchase price means low income groups may be less able to purchase new EVs and enjoy incentives in the short term. Potential impacts upon urban realm/rural landscapes from charging infrastructure and refuelling hubs. Local grid network capacity issues. Increased embedded carbon in vehicles than ICE vehicles in the short term. Reduced revenues from Vehicle Excise Duty and Fuel Duty. In relation to CAVs: May increase ridership, making private mobility accessible to a larger section of society. Increases in city/town centre congestion levels. Loss of employment from service providers that would be in competition with CAV services (e.g. taxi drivers).
Demand Management	Encouraging uptake of shared mobility.	Reduced TRSE especially if focussed in low income residential areas and areas of low home charging capability. Reduced congestion. Reduced embodied carbon if it stimulates lower car ownership.	People requiring mobility assistance are likely to be unable to use these services.

		Local air quality benefits. Decreased spending on new transport infrastructure through integration of existing network.	
	Encouraging modal shift to public transport	Reduced congestion. Local air quality benefits. Increased accessibility and potential to reduce TRSE.	Can encourage modal shift away from active modes.
	Encouraging modal shift to active travel and micro-mobility	Improvements in physical and mental health. Local air quality and noise benefits. Reduced congestion. In relation to e-bikes/e-scooters: Increased accessibility.	Safety (potential to increase RTAs involving cyclists). In relation to e-bikes/e-scooters: Higher levels of embodied and operational carbon than non-motorised bikes. May attract modal share. Potential for conflict with other road users and pedestrians.
	Digitalisation, working from home and localisation	Local air quality and noise benefits. Reduced congestion. Improved access to community services and facilities. Higher local spending and more investment in local areas.	Potential adverse impacts upon mental health. Potential to increase TRSE if policies reduce access to transport solutions for those who need to travel. Shifting of emissions to different sectors (e.g. energy sector) Impact upon viability and productivity of city and town centres.
	Disincentivising car use	Potential to ring-fence revenues for active travel/PT schemes. Reduced congestion. Local air quality and noise benefits. Associated health benefits if mode shift to active travel.	Potential to exacerbate TRSE for with less/no alternatives to private car use. Levies can create inequitable impacts upon businesses where employees and customers have few other mode choices.
Improving Freight Efficiency	Planning for Urban Consolidation Centres	Local air quality and noise benefits. Reduced congestion with associated economic and safety benefits. Financial benefits from economies of scale. Can reduce cargo handling and improve security, reduce damage and loss of goods.	Depending on location, potential to blight particular areas with elevated level of HGV and delivery vehicle traffic.
	Local community drop off/pick up and green shipping options	Local air quality and noise benefits. Reduced pavement parking by delivery vehicles. Potential for an increase in local spending within community centres.	Higher costs for 'just in time' or next day deliveries may disproportionately affect lower income groups and smaller businesses.
	Fuel efficient driving / aerodynamics	Cost savings on fuel. Local air quality benefits.	
	Shifting freight from road to rail	Local air quality and noise benefits. Labour market opportunities in relation to manufacture and installation of electrification infrastructure.	Labour market changes as more freight moved by rail, disproportionately affecting those with low to middle levels of education.

Transport Related Social Exclusion and Distributional Impacts

It will be important that policy makers at both a local and national level both understand and take actions to mitigate the risk of adverse consequences arising as a result of decarbonisation policy and measures.

Examining the relationship between Transport Related Social Exclusion (TRSE) and transport decarbonisation measures is the subject of one of TfN's priority actions to 2025, further details of which are included in Chapter 9. The evidence and data generated through this research can be used by our Partners to help identify where transport decarbonisation policy measures may need to be altered to avoid exacerbating existing TRSE issues and to maximise the opportunities to reduce TRSE.

Chapter 3 of this Strategy provided a high-level overview of how emissions vary across different groups in the North, by gender, age and employment type. TfN's Analytical Framework will allow us to provide more detailed spatially disaggregated socio-economic data to partners, to help ensure local decarbonisation measures avoid disproportionately affecting more disadvantaged groups.

When looking at average carbon intensity for specific occupations and education levels, people with low and middle levels of education (those with education up to A levels) tend to be employed in jobs with a higher average carbon intensity than more highly educated employees (degree level and upwards), with many of the former being classed as 'process plant and machine workers' with a high propensity to work in the transport and storage industry¹².

These workers may be more exposed to labour market changes as a result of a net-zero transition, both in terms of direct changes to the transport system (e.g. a future scenario where more rail is moved by freight), or indirectly through changes in the vehicle manufacturing industry or energy generation sectors. Labour market changes as a result of the net-zero transition may also provide opportunities for these groups, particularly in electrification (rail electrification and grid upgrades of EV infrastructure) and the manufacture of ZEVs and their components (e.g. gigafactories).

The use of cars by lower income groups is often driven by accessibility and affordability challenges:

- The need to travel to work 'out of hour' shifts (e.g. cleaners, post office workers, warehouse workers).
- Due to disabilities that means using shared modes of transport or active modes is not possible.
- Those who live or work in areas of low public transport accessibility, which can be exacerbated by the correlation between high access and high house prices.
- Public transport costs for some journeys can be prohibitive and therefore private car travel offers a cost-effective alternative.

For these groups, demand management measures which increase the cost of car use and decrease the convenience, may experience increased levels of TRSE. Similarly, the higher purchase price of ZEVs may mean that policies to increase the speed of uptake may lead to uneven distributional impacts on lower income groups who are least able to afford them.

Public transport and shared transport modes can be essential for groups who have no access to private vehicles for financial or accessibility reasons (for example, those living in flats or terraced housing with no parking facilities). Whilst these groups may benefit from policies to enhance public transport provision; policies to encourage the uptake of ZEVs have the potential to impact upon

¹² HM Treasury, Net-Zero Review: Interim Report (2020)

public transport provision (e.g. use of bus lanes by ZEVs and other shared modes, increased congestion in low emission zones).

Managing the distributional impacts of decarbonisation: In their Net Zero Review: Interim Report (2020), the Treasury propose a series of measures to manage these effects, including:

- the ongoing burden of a policy can be increased or reduced for different groups, or some can be excluded from paying altogether (e.g. surcharges, exemptions or targeted reliefs);
- targeted support can be provided to cover the capital and/or running costs caused by a policy (e.g. targeted scrappage schemes coupled with low-emission zones);
- the funds raised by a levy or tax can be redistributed to a particular group to offset the primary impact (e.g. road-user charging);
- the general tax and welfare system can be used to compensate those who are affected (e.g. targeted tax cuts or higher welfare payments); and
- progressive redistribution can also be a co-product of policies with other explicit aims (e.g. taxes on air travel).

Chapter 6 - Consideration of embodied carbon

What is embodied carbon?

The ‘embodied carbon’ component of a project refers to the emissions of greenhouse gases arising from:

- the sourcing and extraction of the raw materials needed to build the project;
- the energy needed to process those raw materials in construction components (i.e. the manufacturing stage);
- the transporting of those building materials; and
- the construction activities themselves from construction plant, through to worker accommodation and transport.

Embodied carbon is often referred to as supply chain carbon, or construction carbon, and is sometimes considered separately from operational emissions that refer to the emissions of greenhouse gases arising as a result of the operation of a development.

For example, the embodied emissions associated with a new road might include consideration of the emissions associated with sourcing and processing raw materials, transport of materials and the construction of the road itself, whilst the operational emissions would include those generated by the vehicles that end up using the scheme throughout its operational life (including maintenance related emissions).

EXAMPLE BOX: The Rail Safety and Standards Board (RSSB) estimates that in the reporting year 2019/2020, the UK rail industry generates approx. 3.5 million ktCO₂e in relation to traction energy (i.e. operational emissions) but that its embodied carbon emissions are closer to 5.2 million ktCO₂e - 48% higher¹.

Every infrastructure development will use embodied carbon; however, many will stimulate behaviours or facilitate technologies that reduce greenhouse gas emissions, from a ‘business as usual’ state, during their operation. For example, a new electrified railway can encourage a reduction in private car vehicle mileage, substantially reducing passenger travel carbon intensity. The amount of time that is needed to recoup the embodied carbon of a project, through the reductions in emissions realised as a result of its operation, is often called the ‘payback period’.

Where payback periods are unacceptably long, **carbon sequestration** may be an option to reduce the overall net balance of embodied carbon within a scheme. Carbon sequestration is a term used to describe actions that absorb and store carbon dioxide from the atmosphere. Carbon sequestration activities that may be incorporated within our major infrastructure projects broadly fall into two categories: natural processes such as tree planting and peatland restoration; and the use of innovative construction materials such as carbon ‘absorbing’ cement and concrete. Whilst sequestration may play a part in reducing net emissions associated with schemes, and maximising sequestration is a worthwhile goal, it is unlikely to offset more than a small proportion of the embodied carbon across a scheme and needs to be considered and utilised in that context.

Another term, commonly used, is ‘Whole Life Carbon’. In the context of major transport infrastructure, it is used to describe the emissions associated with project from ‘cradle to grave’. This means its embodied emissions, plus those emissions generated through the operation of the scheme

¹ RSSB DECARB: Carbon Measurements (T1197) <https://www.rssb.co.uk/en/research-catalogue/CatalogueItem/T1197>

and finally its ‘end of life’ profile (i.e. those emissions associated with decommissioning and demolition). For the purposes of this Strategy, both embodied carbon and operational emissions have been considered, albeit separately.

How TfN is considering embodied carbon

The accounting principles for carbon mean that embodied emissions from constructing transport projects do not count as ‘transport emissions’ but as part of industrial emissions.. It is for this reason that the Government has suggested that carbon from the construction of transport schemes is outside of the scope of the Transport Decarbonisation Plan.

It is also difficult to robustly calculate the likely embodied carbon footprint of major infrastructure developments at a conceptual level of design or when the scheduled design and construction of the infrastructure is many years or decades in the future. Equally, it can be problematic to forecast the extent to which embodied carbon may be reduced on future schemes through careful design, responsible sourcing of construction materials, and innovative construction techniques.

For these reasons, the consideration of embodied carbon is outside of the scope of our decarbonisation trajectory and pathways, however, it is not outside the scope of this strategy. TfN is clear on the significance of embodied carbon in the North’s future transport system and across the projects that make up TfN’s Investment Programme (IP). Alongside our partners, we are committed to developing a carbon reduction culture, permeating every stage of the project development lifecycle.

It is inevitable that, as a region, the North will have to ‘spend’ some carbon to develop a truly sustainable multi-modal transport system. Whilst the programme of physical infrastructure projects that make up our IP will be expected to pay back its embodied carbon eventually through the operation of those projects, in the short term, carbon sequestration is expected to play some part in achieving our decarbonisation ambitions.

What we are doing at a strategic level:

TfN has agency to influence the embodied emissions associated with the scale, nature and design of the portfolio of projects within its IP.

We want to better understand the level of emissions likely to be generated by the construction of the schemes included in our IP and also explore how we can start reducing that profile at the earliest point. We’d also like to understand the relative carbon pay-back period of the projects and programmes within our IP.

TfN is collaborating with DecarboN8, a network led by the eight most research-intensive universities in the North working with industry and government to facilitate zero emission transport systems, to explore the embodied emissions associated with the multi-modal corridors proposed within our Strategic Development Corridors (SDCs).

A pilot study was initiated in September 2020, focusing on the Tyne and Wear – South Northumberland sub-corridor within the ‘Connecting Energy Coasts’ and ‘East Coast’ corridors, being a sub-corridor example with a good mix of road and rail schemes. This pilot study is scheduled for

completion in 2021, and the outputs will be assessed as to whether and how they might be used within the appraisal and sequencing of schemes within TfN's IP.

The result of this study will also form a baseline for further work addressing the questions of if and how embodied emissions can start to be mitigated at this strategic level.

What we are doing at a project level:

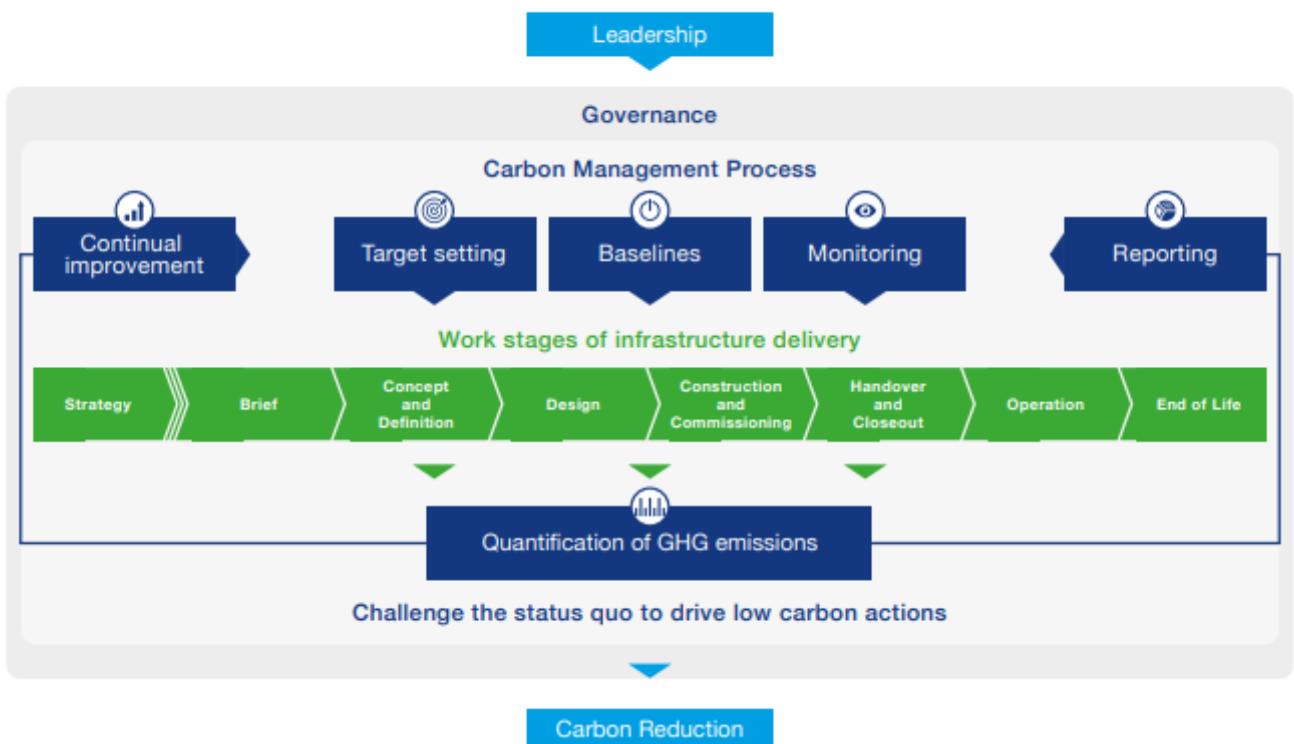
TfN will set a supply chain carbon reduction target for each TfN-led major infrastructure project.

To do this we will:

- **Embed the consideration of embodied carbon within our upstream project appraisal processes**, so that we understand the relative carbon intensity related to different design options and the particular aspects within our schemes generating the highest amount of embodied carbon emissions. It is during the initial concept design stages where the opportunity to reduce carbon is greatest.
- **Develop an embodied carbon project information repository** for major transport infrastructure developments as one of TfN's planned activities to 2025. This could be used by both TfN and our partners to ensure consistency in baselining embodied carbon during the initial design stages of development projects.
- **Set a supply chain carbon baseline for each TfN-led project**, based on early carbon footprinting work carried out during the upstream project appraisal and TfN's embodied carbon project information repository. It's against these baselines that we can set and pursue our supply chain carbon reduction commitments.
- **Use a Carbon Management Process** to achieve our supply chain carbon reduction target, through the adoption of PAS 2080 on TfN-led projects. PAS 2080: 2016 *Carbon Management in Infrastructure* (launched in May 2016) is a voluntary carbon management framework designed by the UK Green Construction Board. The use of PAS 2080 will help us to establish a common understanding and approach for managing the whole-life carbon of our projects. The framework, as illustrated in **Figure X**, assigns roles and responsibilities to those leading, designing, constructing, maintaining and operating the transport infrastructure, in playing their part to drive low carbon actions. For those schemes within our IP that are not TfN-led, we shall encourage our delivery partners to align to the same standard or other recognised similar standard or specification.
- **Optimise opportunities for carbon sequestration** through both enhancing natural processes and the use of innovative construction materials, using our Carbon Management Process to ensure this objective is understood and implemented throughout the design and construction of TfN-led schemes.

For Northern Powerhouse Rail (NPR) we will set a supply chain carbon baseline and corresponding carbon reduction target by the end of 2021, for use and implementation during both the design and construction stages of the project.

Figure X: PAS 2080 Carbon Management Process, Source: PAS2080:2016 – Carbon Management in Infrastructure



Chapter 7 – Climate change adaptation and resilience

Changes to global climate, as a result of the release of carbon dioxide and other Greenhouse Gases into the atmosphere, are already happening and are visible through the increased prevalence of heatwaves, floods, droughts and fires.

Less visible effects, but equally as worrying, include damage to marine ecosystems leading to fisheries failing, sea level rise, increased risk to water supplies and a rise in global food insecurity, as well as an unprecedented loss of biodiversity.

Although we can't be certain of what our future climate will be in the North, it's important that we understand the potential changes that may occur within the limits of uncertainty and how these changes might affect the viability of our transport systems and how our transport infrastructure might exacerbate or reduce the effects of climate change on other people.

Factoring in the effects of climate change

The latest climate predictions (UKCP18¹) predict progressively hotter, dryer summers and warmer, wetter winters, with increasing frequency of extreme weather events such as storm events and heat waves.

The Environment Agency's 'Climate Impacts Tool: Understanding the risks and impacts from a changing climate' (2019), provides a starting point to help us understand an upper limit on possible change across three timescales: today's climate, the 2050s and the 2080s, consistent with a 4°C rise in global mean temperature by the end of the century. **Figure X** is based on national England averages, taken from the Environment Agency Climate Impact Tool. It starts to give us some idea around the magnitude of changes that we might expect in a 4°C rise scenario.

¹ <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/download-data>

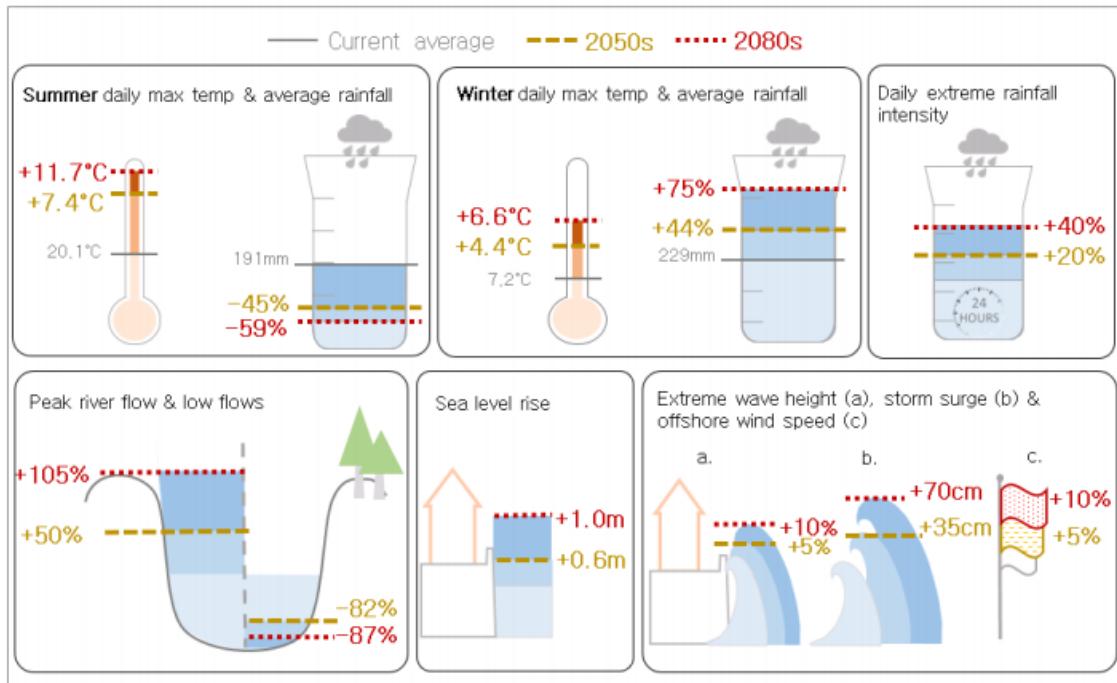


Figure X: Environment Agency's Climate Change Tool (2019).

Whilst the UK is committed to reducing its emissions in alignment with the goals of the Paris Agreement, i.e. limiting global temperature rises to well below 2°C on pre-industrial averages, global emissions trends are set to exceed the threshold levels required in the future to achieve these goals. For this reason, we need to understand the potential climate change effects resulting from greater global temperature rises when determining the resilience of our current and planned transport infrastructure.

The latest UK Climate Change Risk Assessment (UKCCRA)² identifies a number of risks to transport infrastructure, which are illustrated in Figure X.

² <https://www.theccc.org.uk/uk-climate-change-risk-assessment-2017/>

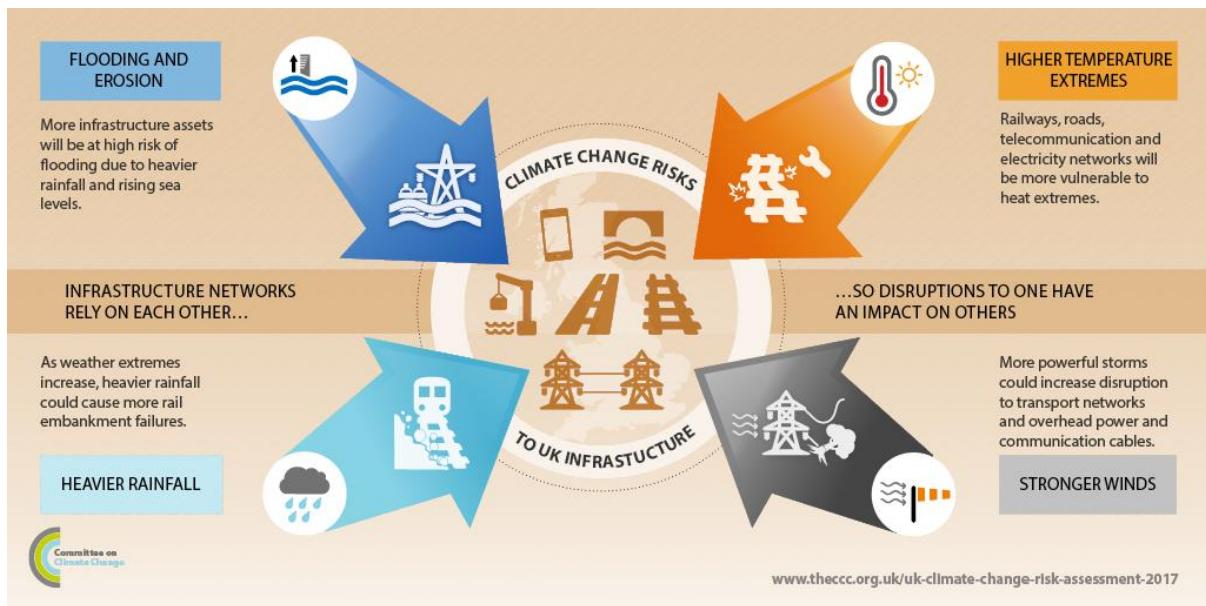


Figure X: Key risks to infrastructure from climate change.

The Committee on Climate Change (CCC) notes that the most significant climate change risk to UK infrastructure is increased frequency of flooding from all sources³, with the number of infrastructure assets exposed to this risk, set to double by the 2080s. This can be seen most clearly in relation to the highway network, where currently 1% of UK roads are at risk of flooding, however, this rises to over 40% in the event of a 2°C rise in global temperatures. Our rail network already experiences significant disruption from various seasonal weather-related factors from flooding to leaf-fall through to rails buckling from heat during the summer. The disruption associated with these events is likely to get worse.

Other climatic aspects which should be considered within our planning for transport infrastructure include those associated with extreme weather events such as stronger wind, more frequent lightning strikes, high and low temperature extremes, as well as increased fog and high humidity events.

Climate change adaptation themes

Whilst climate change **mitigation**, the main focus of this strategy, refers to those measures that reduce greenhouse gas emissions, climate change **adaptation** measures are those that reduce or avoid the potential for harm caused by a changing climate, as well as those measures that seek to exploit the potential opportunities presented.

A review of national and local policies and guidance, including that of our delivery partners, identifies a number of main themes within which adaptation measures related to transport infrastructure can be categorised. These represent the immediate priorities for climate resilience.

Flood risk management. Predictions of increased extreme rainfall events and warmer, wetter winters means that increased flooding from rivers and groundwater will be a key consideration for our transport systems in the North. Transport infrastructure situated near rivers will be more susceptible to direct flooding as well as ground movements caused by bankside erosion.

³ The second UK Climate Change Risk Assessment, CCC (2017).

Storm surges and rising sea levels are likely to increasingly effect transport infrastructure near our coasts, estuaries and tidal reaches of our rivers.

There is a need to ensure both new and existing transport infrastructure is resilient to floods based upon current climate projections.

Both the regularity and intensity of flooding can be reduced by identifying problem locations and regularly monitoring existing drainage systems. Scheme promoters need to understand and mitigate any increased flood risk on third parties as a result of new transport infrastructure.

Geotechnical change management. For both existing and proposed infrastructure, asset owners need to identify areas where ground conditions could be affected by increased rainfall and groundwater levels (e.g. soil saturation or slippage).

Improve service resilience in infrastructure. Scheme promoters will need to understand the links and interdependencies between stakeholders and assets in other sectors (e.g. telecommunications and power generation) so we understand the full potential for disruption and the increased costs of delivering infrastructure that is resilient to that disruption.

Adoption of green and blue infrastructure. Designers should look at opportunities within their projects to adopt green and blue infrastructure as a way to combat overheating and excess water run-off.

Heatwave planning and management. The predicted increase in extreme weather events may also lead to periods of extreme heat, on top of already higher average summer temperatures. The materials used to build our transport infrastructure and the vehicles that operate on it will need to be resilient to these weather episodes, not only ensuring continued operation but also maintaining passenger comfort. There is a need to identify how existing assets can be upgraded as well, such as employing cooling technologies and alternative insulation for our rail stations and the removal of jointed track and obsolete fastenings to make our rail tracks more resilient.⁴

Increasing the resilience of active modes. Focus shouldn't just be on major transport infrastructure, but also our active travel infrastructure, and how we can make sure it is resilient and convenient to use in all types of weather.

Knowledge sharing and employee awareness. Many of our partners, including delivery authorities such as Network Rail and Highways England have made significant progress in how they build in climate change adaptation measures to their new developments. TfN will ask all partners to identify adaptation and resilience 'champions' within their organisations to share latest practice and advice with other partners and internally within their own organisations. Themes relating to effective longer-term planning and implementation of climate adaptation and resilience measures include:

Targeted investment for resilience measures. There needs to be proactive investment in resilient materials and adaptation measures. The costs and benefits of adaptation need to be integrated into asset management, investment strategies, economic appraisals and decision-making. The Climate Risk Assessment Process provides a process and platform with which to do this.

Policy, indicators and monitoring. Where they haven't already, transport authorities and delivery bodies should develop specific policy in response to climate risks and adaptation priorities, along with mechanisms for ongoing monitoring of risks and progress against objectives.

⁴ NR South East Route CP6 Weather Resilience and Climate Change Adaptation Plan (2019-24).

Continuous improvement. Tracking the development of innovative technologies and approaches to the development of climate resilient transport infrastructure and systems.

Co-benefits of climate change adaptation

The benefits of developing climate change adaptation measures, particularly **nature based solutions**, are often not limited to increased resilience to climate change effects. If planned and delivered in the right way, potential co-benefits include:

- Ecological enhancements
- Flood and coastal resilience
- Improved water quality
- Improved air quality
- Improved physical and mental human health
- Reduced need for mechanical cooling
- Increased uptake of active travel
- Creation of green jobs

We can achieve nature based solutions through forming partnerships between scheme promoters and landowners, farmers, environmental groups and local communities⁵, making space for excess water in other places, and using tree planting and sustainable drainage systems to store and slow down runoff from intense rainfall events. These green spaces can deliver co-benefits of providing valuable habitats for native wildlife, as well as accessible green spaces for promoting wellbeing.

For example, the creation and use of ecologically rich pond and wetland habitat to attenuate and filter rainwater runoff from major transport infrastructure can provide valuable habitats for native wildlife, as well as recreational space and educational opportunities for local communities.

How we are increasing the resilience of our projects

Our principal delivery partners, Network Rail, Highways England and HS2, have taken a lead in planning for the resilience of the transport systems they promote and maintain. TfN's role, however, in developing an investment programme for the North's transport system means that as an organisation, we need to understand the implications of climate change on that system.

By undertaking a Climate Risk Assessment, we are able to identify and assess the climate change risks for our major transport infrastructure programmes and for any other projects with elements that could be affected by the weather and effects of climate change.

Guidance on when to undertake a Climate Risk Assessment and the assumptions to use in terms of global temperature rise is given within the Supplementary Green Book Guidance 'Accounting for the Effects of Climate Change' (DEFRA, 2020). Where a project, policy or programme is likely to have a lifespan that goes beyond 2035, the guidance recommends that it should be considered in the context of at least two future climate scenarios aligned with both a 2°C and 4°C rise in global temperatures.

⁵ National Flood and Coastal Erosion Risk Management Strategy, Environment Agency (2020)

We will undertake a Climate Risk Assessment for all TfN-led major infrastructure projects. By doing this we will be able to:

- Re-develop and refine early designs to improve resilience to future climate change
- Incorporate climate scenarios within our appraisal of costs and benefits
- Identify no or low regret adaption actions
- Develop adaptive management processes that allow a project to adapt to changing risk over time, given the high uncertainty over the future impacts of climate change
- Prioritise green infrastructure solutions which can deliver a wide range of co-benefits

Through our projects, we will also develop a strong collaborative relationship with the Environment Agency (EA) to stay abreast of major issues in relation to flood risk and geotechnical change, and discuss mitigation strategies.

For those schemes within our IP that are not TfN-led, we shall encourage our delivery partners to align to the same or a similar process for identifying climate change risks and opportunities.

Chapter 8 – Stimulating Clean Growth In the North

Financial profit is now not the only driver of growth, as we recognise that positive outcomes for people and the environment are also essential to achieve sustainable long-term growth. Transport is a key enabler to achieve the **Triple Bottom Line**.

INSERT DIAGRAM SHOWING TRIPLE BOTTOM LINE

Whilst the ultimate stated aim of transport decarbonisation is to limit and eventually eliminate greenhouse gas emissions as a result of our travel, the potential opportunities it can provide in terms of driving economic growth and social value are significant.

TfN has a strategic objective to facilitate transformational economic growth. This underlying theme drives our Decarbonisation Strategy. Our policy analysis has allowed us to understand ‘what needs to be true’ in terms of transport decarbonisation policy, to allow the North to benefit from the significant economic and connectivity outcomes which would result from the schemes within our Investment Programme, at the same time as achieving our decarbonisation commitments.

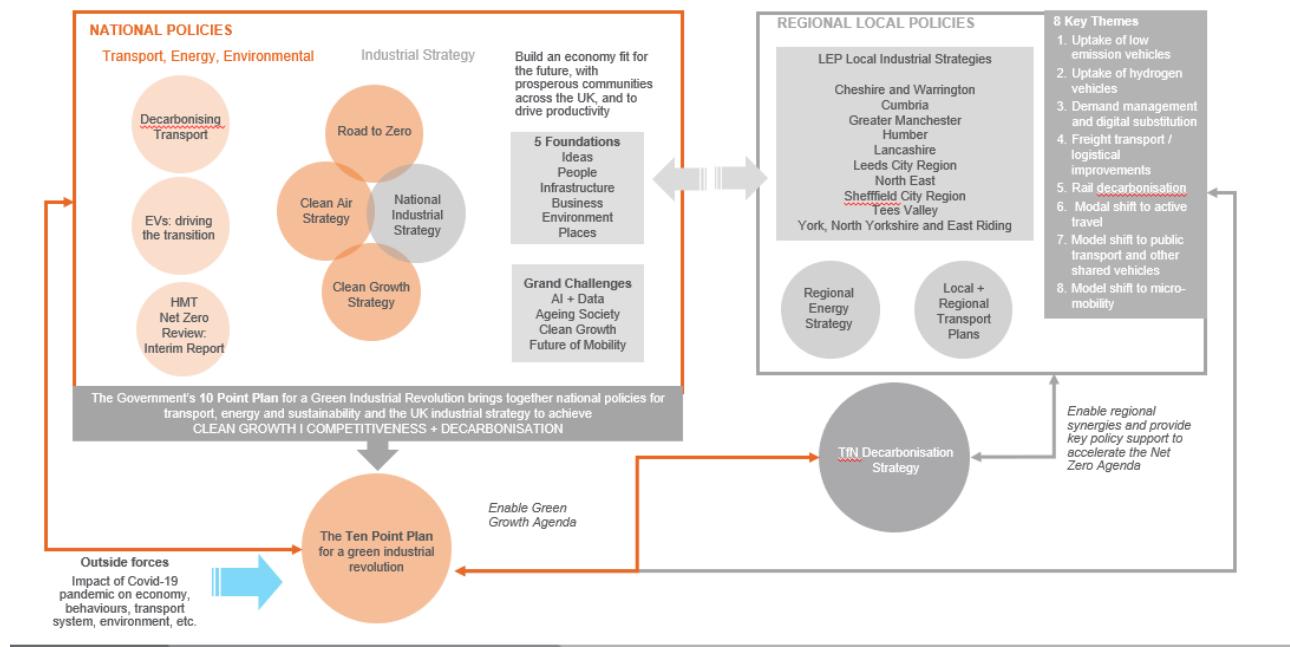
At the same time, it’s important that we understand the opportunities for transformational economic growth that can be **driven** by the decarbonisation of transport itself. Economic growth that is achieved at the same time as cutting greenhouse gas emissions is often referred to as ‘clean growth’.

During the preparation of this Strategy, we explored the existing clean growth opportunities and initiatives already identified by our LEP partners and other business/industrial groupings. We wanted to understand how TfN could support these opportunities and initiatives, as well as understanding any opportunities that remain relatively unexplored and which of these exhibits the most potential for the North.

The key outcomes from this work are presented in this chapter, along with some analysis of where we feel TfN can play a meaningful role in supporting clean growth opportunities in the North.

Figure X, frames our Decarbonisation Strategy within relevant national and regional strategies which are aimed at setting the UK on a sustainable clean growth path, conceptualising the interdependencies between Northern Local Industrial Strategies (LIS) and national strategies. Our work included a high-level review of this policy framework focussed around eight key transport decarbonisation themes.

Figure X: Clean Growth Policy Framework



The findings of our clean growth opportunities review are presented around the identified key transport decarbonisation themes.

Zero Emission Vehicles and Charging Infrastructure

Zero Emission Vehicles are a necessity to achieve full decarbonisation of transportation and significant growth opportunity for the North

Regional Strengths:

- Proximity to industry and expertise in the chemical, automotive and aerospace sectors, particularly in Cheshire and Warrington, Greater Manchester, Humber and Tees Valley.
- Strategic locations for test bed applications, for example, for rural ZEV infrastructure and operation using the Lake District National Park.

EXAMPLE BOX: Project Charge (2019 -2022) runs across Merseyside, Cheshire, North Shropshire, North & Mid Wales. The project merges transport and electricity network planning to create an overarching map of where EV charge points will be required and where they can be best accommodated by the electricity grid.

EXAMPLE BOX: The City of York's Public Electric Vehicle Charging Strategy 2020-2025 outlines the city's plans to:

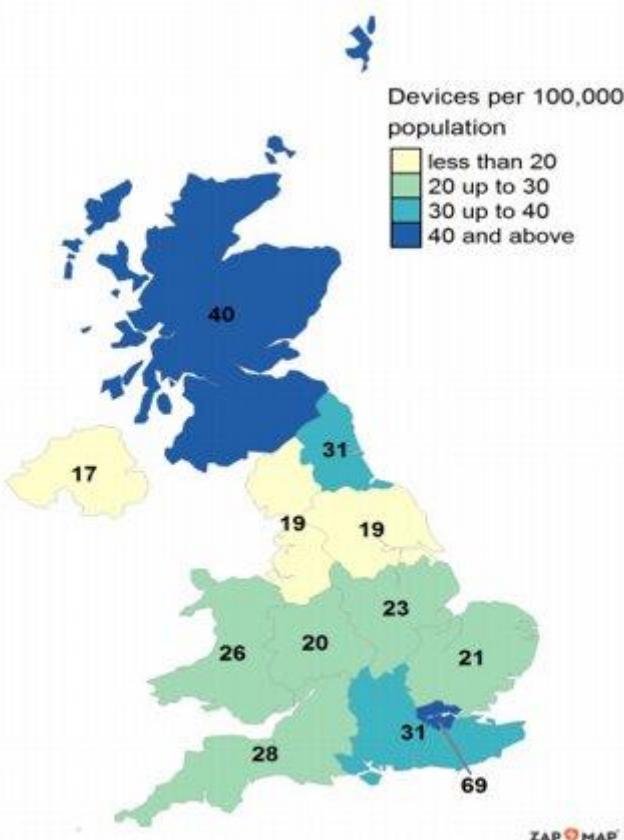
- install fast chargers at 5 per cent of parking bays within their own long-stay car parks
- use funding from the UK Office for Low Emission Vehicles and the European Commission to install ultra-rapid chargers in hyperhubs at strategic locations around York

- provide competitive tariffs to minimise the costs of using an EV for local residents and businesses.

Regional Challenges:

- Relatively high proportion of rural areas and terraced housing which pose challenges to the installation of effective ZEV charging infrastructure and ZEV operation.
- Uneven capabilities in relation to accessing grants and funding for ULEV infrastructure.
- Most charging infrastructure provision is market led to some extent and this has led to an uneven geographical distribution of existing charging devices within the UK.

Map X Public Charging Devices per 100,000 of population by UK region¹



Regional Opportunities:

The widespread adoption of ZEVs will need to be supported by the provision of adequate charging infrastructure that caters to road trips that occur with the region as a whole and not just the places within it.

- Northern LEPs are well placed to support and host giga-factories (for manufacturing ULEV batteries and parts) with OEM vehicle supply being a critical factor in achieving the UK's decarbonisation targets. The UK Government has identified up to £1bn of spending on an automotive transformation fund, although has yet to decide on exact funding allocations.

¹ Sourced from DfT, Electric Vehicle Charging Device Statistics, January 2021

Zap-Map, Office for National Statistics licensed under the Open Government Licence v.3.0

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- Scaling up the supply chain can achieve economies of scale and reduced cost across the ZEV value chain.
- Testing and trials of innovative ZEV charging technologies focussed on delivering rural and on-street ZEV charging solutions.
- Exploring the potential of multi-modal mobility hubs, including ZEV charging infrastructure, to stimulate urban regeneration, both by creating an additional incentive to visit and support local businesses and by improving access to affordable sustainable mobility.

Potential TfN Activity:

A catalyst for ZEV uptake and charging infrastructure deployment.

- Engage with and support partners to access funding, technical expertise and co-ordination with the Distribution Network Operators (DNOs). Facilitating cross boundary teams amongst partners to deliver strong and **effective bidding propositions** for ZEV funding and trials.
- Engage with partners to support programmes and campaigns to **build awareness** in our communities via strong messaging around the financial and environmental benefits of ZEVs (relative to the use of equivalent ICE vehicles).
- Develop a **coherent, data driven, regional ZEV Charging Infrastructure plan**, including an assessment of provision of charging infrastructure, **on-street and in rural and remote areas**. Coupled with this, TfN could look to influence government to alter the competitive bidding process into a more **outcomes-driven allocation** based on evidence and data.

CGA1: Develop a **regional EV charging Infrastructure Study** – laying the foundations for an outcomes driven approach to the delivery of charging infrastructure in the North, ensuring our network caters for the full range of journeys being made to, from and within our region.

CGA2: Supporting local partners in the development of local ZEV infrastructure charging plans and the pursual of funding opportunities, through the provision of data and evidence.

Hydrogen Vehicles and Refuelling Infrastructure

The North has competitive advantage in hydrogen production, but a strong business case for hydrogen transport applications is yet to emerge.

Regional Strengths:

- Existing clusters of hydrogen producing industry located around Liverpool, Cheshire and Warrington, the Humber estuary and Tees Valley.
- Existing hydrogen clean growth opportunity partnerships, for example HyNet North West (supported by Manchester, Liverpool and Cheshire and Warrington LEPs), the North West Hydrogen Alliance, and Zero Carbon Humber.

- Liverpool City Region, through HyMotion, deploying hydrogen buses and refuelling systems as well as becoming the first public hydrogen refuelling station in the North West.

EXAMPLE BOX: UK H2Mobility brings together industry (fuel cell technology, energy & gas utilities, fuel retail, car and train manufacturers, government and Devolved Administrations) to support the development of hydrogen as a transport fuel and further the commercial roll-out of hydrogen mobility technology. A roadmap details how the UK can build a hydrogen refuelling infrastructure to support the introduction of Fuel Cell Electric Vehicles (FCEVs), with the initial focus on developing infrastructure serving metropolitan areas and the major routes which link them. Infrastructure development to date has been a public-private partnership with national and local governments, and fuel cell, industrial gases, energy, and vehicle manufacturers.

EXAMPLE BOX: The HyNet North West partnership is to create the UK's first CCUS infrastructure including a hydrogen pipeline.

EXAMPLE BOX: The Nordic Hydrogen Partnership consists of regional clusters involving major and small industries, research institutions, and local, regional and national authorities. The national bodies covering Norway, Sweden, Iceland and Finland act as NHP coordinators. Most hydrogen installations are meant to serve fuel cell buses, as well as cars. Activities are based on collaboration across the borders and are backed with strong public and private support in terms of funding, financial tax exemption schemes and investments.
(www.nordichydrogenpartnership.com)

Regional Challenges:

- Despite a strong focus on hydrogen in the region, the development, testing and uptake of hydrogen vehicles is not a strong priority, at present, for the region in general.
- Viability of hydrogen as a fuel source is likely to depend on the deployment of Carbon Capture, Use and Storage (CCUS) in the short and medium term.
- Competition for hydrogen from high-priority hard decarbonise industrial uses and government strategic priority to utilise hydrogen for domestic heat.
- Current absence of Europe-wide strategy for low-carbon HGV. Investment in infrastructure will be at risk until established.
- Lack of certainty within supply chain around future supply/demand dynamics.
- Industrialisation of electrolyzers, fuel cells and hydrogen tank manufacturing – and linked to this, the current high production cost of hydrogen which will be important for fuel-intensive transport uses.

Regional Opportunities:

Increased certainty around future hydrogen transport applications will allow a scale-up of the supply chain, necessary to support viable deployment of the technology.

- Hydrogen as a fuel source could contribute significantly to the decarbonisation of ports and shipping.
- Much of the hydrogen production in the region is still based on fossil fuels, supporting our industrial ports to start the shift to a green hydrogen supply would drive down overall costs through scale and enable the deep decarbonisation of ‘first mile’ freight transport that utilise our ports (e.g. shipping and HGVs).
- Job creation in energy-intensive industrial regions (e.g. Humber and Tees Valley) to offset and exceed any expected job losses due to step changes in the decarbonisation agenda.
- Potential for the development of low carbon hydrogen (blue hydrogen) from gas reforming combined with Carbon Capture and Storage (CCS) alongside the scaling up of green hydrogen production.

Potential TfN Activity:

There is no short-term policy that will allow an accelerated deployment of hydrogen in transport, but taking action to ready the supply chain in priority sectors will build the foundations for the future.

- Apply a ‘look ahead’ in systems planning and **supporting the supply chain** by assessing future infrastructure requirements (e.g. refuelling networks) to expedite and encourage uptake once the technology becomes ready to enter the mainstream market.
- Encourage collaboration with other regions (e.g. Scotland and Wales) and other sub-national transport bodies, mirroring the success of initiatives such as the Nordic Hydrogen Partnership.
- Encourage and support our LEPs to develop a green hydrogen strategy for the North’s industrial ports. Our ports are ideally placed to scale up the use of clean hydrogen, achieve scale in CCUS and decarbonise the ‘first mile’ of freight transport from ports.
- Work with Tees Valley to make the region **the testbed home for hydrogen mobility**, leveraging the existing capability around Tees Valley Net Zero Innovation Centre and the Tees Hydrogen Transport Hub.
- Engage with HyNet North West to identify actions to form supply-chain cluster to include hydrogen transport applications and to pool resources and share knowledge around the adoption of hydrogen fuels for transport.

CGA3: Undertake or support a **pan-northern hydrogen transport refuelling study**. Provide confidence to users about the future path of the technology, in particular with regards to priority application, e.g. hard to electrify rail services and long-haul HGVs.

CGA4: Supply chain support for future hydrogen infrastructure solutions for both first and last mile hydrogen applications. TfN to engage in emerging hydrogen partnerships in the North to support the development of a viable business case for hydrogen and provide confidence to the supply chain.

Demand Management, Digitalisation and Modal Shift

Embracing new technologies and providing access to alternative modes of travel is essential to achieving our decarbonisation objectives, especially in the short term

Regional Strengths:

- Strong support for both MaaS and digital substitution within LEP strategies.
- Strong pipeline of existing proposals to help make the region a world leader in digitalisation. This includes Greater Manchester's ambition to become a top five city-region for the digital economy in Europe, with full fibre broadband and 5G coverage, and, the Borderlands Inclusive Growth Deal proposal that seeks to complete the roll-out of super-fast broadband to properties that do not yet have access in Cumbria.
- Strong regional support for modal shift to public transport.
- Significant support for rail investments, including Northern Powerhouse Rail.
- Ambitions in many city regions (e.g. Sheffield and Liverpool) to deliver zero-carbon public transport networks.
- Existing programmes piloting demand-responsive transport and community-based initiatives as a solution to the problem of accessibility in rural areas in the Tees Valley.

Regional Challenges:

- Despite some areas experiencing world-class digital connectivity, some areas of the region still have limited broadband connectivity which needs to be addressed to allow for effective employment of MaaS systems, improved customer experience on public transport and digital substitution, in a way that meet the needs of the North's often dispersed populations, labour force and economy.
- Continued investment needed to expand 4G mobile data coverage and to support the transition to 5G.
- The North's topography and climate, especially in more rural areas, act as a barrier to active travel uptake.
- Local bus services are often considered unreliable and expensive.
- Some existing industrial employment centres are poorly serviced by public transport and in some areas there are no direct rail alternatives for passenger or freight movements which creates reliance on the Strategic Road Network (SRN) for both local and regional journeys.

Regional Opportunities:

Capturing and optimising the economic, social and environmental benefits from digitalisation and cleaner, greener travel.

- Development and updating of LEP Digital Infrastructure Plans, where needed, to support the transition towards 5G.

- Proliferation of 5G innovation opportunities / programmes in the Tees Valley.
- Development of a Mobility Hub concept, which integrates public transport services with shared mobility services and ZEV charging infrastructure. Hubs can act as a focus for economic growth by creating an additional incentive to visit community and commercial centres.
EXAMPLE BOX: Plymouth City Council has secured £6M to build 50 mobility hubs. This is to be established by 2023 and are to include electric vehicle charging infrastructure, an e-car club, e-bikes and digital information boards. Additionally, an integrated MaaS platform will be developed to enable travel.
- To become a leader in the development of rural public and active transport solutions. Exploring how new technologies can transform rural travel and incentivise the use of public transport and other forms of greener, shared and active mobility, and, how these solutions can stimulate return-investment in our rural communities.
- Given the aspirations for zero-carbon public transport networks existing across the North's city-regions, aggregating orders for ultra-low emission buses from cities across the North could draw significant investment from the OEM vehicle supply industry into the region.
- Championing the consideration of social and environmental value on an equal basis to economic return on investment when competing for government funding for active travel and public transport infrastructure.

Potential TfN Activity:

Creating a narrative for sustainable future travel in the North

- Supporting and encouraging programmes such as the Made Smarter Tees Valley Pilot; 5G Testbed and Trials Programme and Future Mobility Zones, **to make the Tees Valley a leader for tests and trials using 5G technology in rural areas.**
- Supporting and engaging LEPs in the development or updating of **Digital Infrastructure Plans**, to deliver strong messaging around the benefits of MaaS and digital substitution and also robust timelines in relation to the delivery of the enabling technology.
- To influence government for continued investment to expand the **North's 4G mobile data coverage and support the transition towards 5G** as both an economic stimulator and a key bedrock of an effective, digitally enabled, integrated transport system.
- To facilitate alongside partners, where feasible, the **aggregation of large orders of ultra-low emission buses from across the North's city regions** to attract inward investment and ensure supply.
- As we move towards the decarbonisation of road vehicles, public perception of road investment being the environmentally least friendly option may shift, particularly in rural areas where demand for road investment may increase. There is an opportunity to co-

ordinate, with partners, in **the delivery of strong messaging around the benefits of MaaS, public transport and active travel** and also robust timelines in relation to the delivery of supporting infrastructure and enhanced services. It is essential that the region can provide this parallel narrative to **build back confidence in public transport after the COVID-19 pandemic and create a demand for ‘Liveable Places’**.

CGA5: TfN to support a narrative for the North, utilising its Future Travel Scenarios, combining the advantages of demand management, active travel, micro-mobility and public transport into the evolving lifestyle choices of its citizens. The objective would be to **create a vocal demand for ‘Liveable Places’ across the various geographies of the North.**

CGA6: Supporting our local partners with **data and evidence to analyse potential locations for mobility hubs** and to access funding sources. The hubs should act as stimulators of urban and rural economic growth.

Freight Decarbonisation and Ports

Tailored solutions to deliver deep-decarbonisation of freight transport, recognising the diversity of supply chain and stakeholder needs

Regional Strengths:

- Established freight networks and world leading ports.
- With the UK Government ambition, through its Maritime 2050 Strategy and Clean Maritime Plan, to lead the way in transitioning to a future of zero emission shipping. The North’s ports are well placed to support this ambition through the formation of ‘clean maritime’ clusters.

EXAMPLE BOX: The Port of Rotterdam in the Netherlands, one of Europe’s largest port and energy hub, is positioning itself as a hydrogen leader, working with various partners to make the port area an international hub for hydrogen production, import, application and transport to other countries in Europe. For example, the “H-vision” project brings together industry, the port and R&D partners to investigate the switch to blue hydrogen, which can be achieved with significant public and private investment in new infrastructure. The conversion of existing installations to transport hydrogen to the industrial companies and deliver captured CO₂ to empty fields underneath the North Sea. According to the Port, the focus on large-scale hydrogen infrastructure will strengthen its international competitive position and attract new businesses that focus on sustainability (source: www.h-vision.nl/en).

- Three of our ports have been confirmed as freeport locations candidates, including Liverpool City Region, Teesside and Humber (including Immingham), and are expected to attract investment in manufacturing and logistics infrastructure through tax incentives and customs freedoms. This will make them excellent locations for clean and green transport infrastructure investment. A number of other candidate locations, including, Tyne and Wear and Barrow/Workington also play a valuable role in overall picture for maritime industry and freight transfer within the North.

Regional Challenges:

- Low or zero carbon technology in both maritime and freight sectors is at a relatively low maturity level. Technology selections should ideally be made when the options are mature, so any investment choices made now (e.g. liquid natural gas as a fuel for shipping) will have a long-term impact that is hard to re-frame.
- The North's sizeable freight and logistics sector exacerbates road traffic congestion hot-points, as well as the emissions associated with ports and airports.
- The need for a coherent regional strategy to enhance the North's competitive strength and develop supply chains in relation to the green maritime agenda.
- European cooperation is required to develop compatible solutions for the decarbonisation of freight, recognising the significant number of cross-border trips (by HGVs, shipping and aviation).

EXAMPLE BOX: The European Technology Platform ALICE is set-up to develop a comprehensive strategy for research, innovation and market deployment of logistics and supply chain management innovation in Europe. In 2019, ALICE published its '*Roadmap Towards Zero Emission Logistics in 2050*', looking at the radical changes needed to deliver fully competitive low emissions vehicles, trains, barges, ships and airplanes. (source: Roadmap Towards Zero Emissions Logistics 2050, ALICE (2019), www.etp-logistics.eu)

Regional Opportunities:

Green and competitive ports need a bold vision that combines a roadmap of lowering GHG emissions from shipping and pollution in maritime areas, with integration of other sustainable transport modes

- To lead the way in data collation and democratisation, mapping goods to vehicles in common formats, allowing the North's freight operators, both large and small to benefit from information on efficiency schemes and measures, and the latest technologies.
- TfN's Investment Programme will provide significant additional rail capacity in the region, providing an opportunity to move freight transport from road to rail
- Rail freight is one of the most carbon-efficient means of moving goods, however heavy freight loads typically require overhead electrification (as the zero carbon alternative to diesel traction). The infrastructure works required to achieve coverage of the regions main freight corridors represent an opportunity to invest further in the regions rail manufacturing capability.
- The Government has committed to a £20million investment in the Clean Maritime Demonstration Programme, and that a hydrogen refuelling port will be launched in Teesside.
- There is potential for our partners (ports, local authorities and delivery authorities) to work together to deliver effective 'port to port' hydrogen or electric refuelling corridors across our region. Many of these corridors are identified within the Strategic Development Corridors defined within TfN's Strategic Transport Plan.

EXAMPLE BOX: The Port of Gothenburg, in Sweden, is collaborating with Volvo Group, Scania and Stena Line to accelerate the transition to fossil-free fuels in the transport sector and cut emissions linked to the port by 70% by 2030. The collaboration focuses on the electrification of sea transport. Gothenburg Port Authority will produce the necessary infrastructure and access to fossil-free fuels for heavy vehicles, including electric power, biogas, and hydrogen gas. The freight transporters and Stena Line will have a key role to play by ensuring new fossil-free trucks and vessels are brought into service by 2030.

Potential TfN Activity:

Providing data and evidence to expedite the development of a decarbonisation pathway for shipping and freight

- **Supporting the sector by assessing future infrastructure requirements** for hydrogen or electric refuelling, to expedite and encourage uptake once the technology becomes ready to enter the mainstream market. Supporting the formation of partnerships to consider ‘port to port’ zero carbon freight corridors.
- Using TfN’s analytical framework to **build a better understanding of freight and logistics movements and the effects of efficiency measures and technologies**. Making this data available for to all.
- Supporting the region in becoming of a **centre of excellence for zero carbon ports or shipping** in the region.
- **Encouraging and supporting our cities to develop Sustainable Urban Logistics Plans** through the provision of data and research and developing a structured approach to sharing knowledge through our Northern Evidence Hub.

CGA7: Developing and **supporting partnerships to consider port-to-port, multi-modal, zero carbon freight corridors**, optimising the economic benefits that our freeports and clean maritime clusters can generate for our region.

Rail Decarbonisation

Regional Strengths:

- The North possesses strong rail manufacturing capability and the region is well placed to benefit from a nationwide acceleration of rail electrification programmes, as well as the potential to lead on innovative new clean transport technologies (e.g. hydrogen-powered passenger trains).

Regional Challenges:

- Many of the North’s dispersed communities have poor access to rail services and there is a perception that the existing rail infrastructure needs improvement and better maintenance before investment in decarbonisation programmes.

Regional Opportunities:

- To increase the North's access to both UK and international markets in relation to green rail infrastructure and rolling stock.

Potential TfN Activity:

- Work with government and Network Rail to ensure new rail schemes within our Investment Programme are electrified, including NPR, providing future market certainty to the supply chain and allowing development of further skills and capability in this sector within the North.
- Work with partners, Network Rail and Train Operating Companies (TOCs) **to bid for the testing and trialling of new low emission train technologies in the region.** This should serve as sign of our intent to employ these technologies in the future and attract further investment from the rail manufacturing sector into our region.

CGA8: Supporting our partners to attract testing and pilots of new low emission train technologies in the region.

Our Clean Growth Opportunity Summary Matrix, Figure X, allows us to consider the identified priority Clean Growth Actions relative to each other in relation to their potential to stimulate economic growth and positive health outcomes.

All identified potential Clean Growth Actions have modest to strong potential to stimulate growth in either jobs or skills within our region. The strongest actions in this respect are likely to be those in relation to expediting the effective development of ZEV charging infrastructure and increased uptake of ZEVs in the region, and in doing so, demonstrating significant regional demand to the supply chain.

There is also significant economic growth potential in relation to proving a market for hydrogen fuels for first mile freight journeys, however, this also a greater level of uncertainty around these outcomes which is related to the relative immaturity of technology in this area.

Stronger, 'all-round' performers include actions around supporting demand management and modal shift, which may see increased health benefits and more potential to stimulate growth in a more equitable way.

All eight of the identified potential Clean Growth Actions are taken forward into Chapter 9, where TfN's priority activities to 2025 are considered.

Figure X: TfN Clean Growth Opportunity Matrix

Definition: Socio - Economic Factors		
Jobs	<ul style="list-style-type: none"> Potential to support job growth directly through design, manufacturing and construction opportunities, and also in the wider job market by improving connectivity and resilience 	
Skills	<ul style="list-style-type: none"> Potential to increase the skills base within our communities and the demand for skilled labour to support business growth and new mobility infrastructure. 	
Health	<ul style="list-style-type: none"> Potential to improve the health and well-being of our communities. 	
Definition: Impact		
Strong	<p>Strong potential to deliver socio-economic benefits of jobs, skills and health. Policy is very likely to induce private sector investment and support a high level of job creation in innovative and future industries, requiring an increased level of skilled workers.</p> <p>Strong potential to support the health agenda, encouraging an active lifestyle, and reducing pollution.</p>	
Medium	<p>Those opportunities where there is a more modest potential to deliver socio-economic targets of jobs, skills and health, or where the potential is strong but uncertainty is high. Some potential to support the health agenda, encouraging an active lifestyle, and reducing pollution.</p>	
Low	<p>Weaker potential to deliver socio-economic targets of jobs, skills or health. Policy may not strong outcomes in all three socio-economic areas, or, only over the long-term horizon.</p>	

Clean Growth Actions	Jobs	Skills	Health	Justification
Action 1: Develop a regional EV Charging Strategy	Strong	Strong	Low	Effective ZEV infrastructure resulting in higher ZEV uptake leading to a stronger supply chain. Jobs and skills benefits from the manufacture and installation of infrastructure and investment in the region from OEMs. Health benefits less clear due to risks associated with increased uptake of private vehicles and persistent local air quality emissions along with potential to exacerbate TRSE.
Action 2: Supporting local partners in the development of local EV Charging Infrastructure	Strong	Strong	Medium	Effective ZEV infrastructure resulting in higher ZEV uptake leading to a stronger supply chain. Jobs and skills benefits from the manufacture and installation of infrastructure and investment in the region from OEMs. Provision of data in relation to distributional impact and transport related social exclusion may help obviate adverse potential health impacts.
Action 3: Undertake or support a pan-northern hydrogen transport refuelling study	Medium	Medium	Medium	The hydrogen economy presents significant opportunities for jobs and growth in the North and developing a market in hydrogen for transport would further stimulate this. Medium ratings reflect a significant uncertainty that persists around the viability of hydrogen as a fuel relative to other technologies.
Action 4: Supply chain support for future hydrogen infrastructure solutions	Medium	Medium	Medium	The hydrogen economy presents significant opportunities for jobs and growth in the North and developing a market in hydrogen for transport would further stimulate this. Medium ratings reflect a significant uncertainty that persists around the viability of hydrogen as a fuel relative to other technologies.
Action 5: Supporting a demand management narrative for the North	Medium	Low	Strong	This activity in itself is unlikely to lead to direct significant growth in jobs and skills, however, a shift away from private vehicle use and any uptake in active travel is likely to lead to health and wellbeing benefits. A more effective, integrated and comprehensive public/shared/active transport system is ultimately a likely to be a more equitable transport system, allowing a broader spectrum of our communities access more jobs.
Action 6: Supporting local partners in the development of mobility hubs	Medium	Medium	Medium	Mobility hubs may principally encourage healthier and greener mobility choices, improving air quality and tackling TRSE. Dependent on location and integration into spatial planning, they also provide an opportunity to accelerate commercial regeneration and localisation concepts.
Action 7: Developing and supporting partnerships to consider zero carbon, port-to-port freight corridors.	Strong	Medium	Medium	Using the strong connection between our ports, airports and intermodal terminals to both stimulate the transition to clean fuels and create substantial economic investment opportunities in our ports and their hinterlands. The use of hydrogen as a fuel for first mile journeys, would stimulate the maximum opportunity for our region, however, significant uncertainties persist around the viability of hydrogen as a fuel relative to other technologies.
Action 8: Supporting our partners to attract testing and pilots of new low emission train technologies	Strong	Medium	Low	Given existing strong rail manufacturing base in the North, it is well placed to deliver the materials needed to decarbonise railways/locomotives. Health benefits relatively low next to other actions given the limited portion of air quality / carbon emissions generated from existing railways.

Our work has identified a number of other significant clean growth opportunities for the North. Transport is not the key driver of these opportunities, but it can play an important enabling function.

Advancing Offshore Wind

Substantial installed offshore wind energy generation can be found off much of the North's coasts, with Cumbria being home to the largest offshore windfarm in Europe. The supply chains, research and development activities and deployment of offshore wind farms are significant benefit to many of our existing coastal areas.

Whilst offshore wind and the activities that support it are a relatively mature industry in the North, any opportunities to strengthen the transport infrastructure that supports the industry, should be explored. For example, the UK Government's 10 Point Plan committed to investing £160m into modern ports and manufacturing industries to further boost the UK's offshore wind energy generation capacity.

Further to this, some high-value components are still being imported. Transport links will be important if the region is to attract the appropriate skills base and inward investment to fill these manufacturing gaps.

The energy generated by offshore wind farms could also be used a source of renewable energy to power the electrolysis process required to produce green hydrogen, to be used for transport applications.

Potential TfN Activity

- Preparation of pan-northern hydrogen refuelling network strategy has been proposed as a potential priority activity for TfN (alongside industry stakeholders) before 2025. Any strategy should consider the contribution that offshore wind energy could play in the electrolysis process to produce green hydrogen and understand how the spatial characteristics of a refuelling network might optimise this potential.
- Supporting coastal LEPs (e.g. Humber and Liverpool) to access government funds which would unlock increased investments in the North's port infrastructure, including the formation of clean maritime clusters.

Investing in Carbon Capture, Usage and Storage (CCUS)

The North already leads the country in CCUS research and development, with the region's ambitions being driven by the need to decarbonise the North's heavy industrial clusters, including those in the Humber, Tees Valley and Merseyside. The UK Government's 10 Point Plan pledges significant investment to support the establishment of SuperPlaces: industrial clusters pioneering hydrogen production and carbon capture, returning the latter to under the North Sea. Given its location, the North is perfectly placed to host these clean growth clusters and utilise the hydrogen they produce.

The majority of decarbonisation pathways, including those presented by the Climate Change Committee, rely on an element of CCUS to achieve their decarbonisation trajectories. It is also true that the effective and rapid development of CCUS in the North will be an essential component within the hydrogen supply chain (before green hydrogen production sufficiently develops) if it is to be chosen as a viable fuel source for zero or low emission HGVs. **Without CCUS, it is likely that the decarbonisation pathways for our HGVs would need to pivot to alternative fuel sources (e.g. battery electric). Given the North's potential in relation to the development of CCUS and hydrogen production/use, this would represent a missed growth opportunity for the region.**

The scale of major infrastructure planned through our Investment Programme will also mean that the region's ability to scale CCUS activity, particularly in relation to industries producing construction materials (e.g. steel), is likely to be an important component in mitigating our embodied carbon emissions.

Chapter 9 – TfN’s Priority Decarbonisation Actions

We believe that TfN has an important role to play in achieving transport decarbonisation in the North.

Demonstrating: Evidence-building, running pilots and collating and sharing best practice.

Facilitating: Working for consensus, ensuring consistency, co-ordinating cross-sectoral partnerships and teams, as well as representing our partners as a single, strong unified voice in national forums.

Supporting: Developing regional strategy to support local objectives and provide a basis for effective and co-ordinated influencing of government.

Our policy analysis work has revealed those areas of policy through which the most challenging emissions reductions must be achieved. These provide a focus for our proposed research, data and evidence-building activities in the short-term to 2025. Specific activities generated by this analysis are signposted as ‘Policy Gap Actions’ (PGAs).

Alongside the policy analysis, our exploration of those activities which can provide the greatest potential for clean, green growth in the North has identified eight ‘Clean Growth Actions’ (CGAs).

Finally, a number of additional activities have been identified as priorities and refined through engagement with our partners, industry, research networks such as DecarboN8 and other Sub-national Transport Bodies, and these are highlighted as ‘Stakeholder Driven Action’ (SDAs).

Taken altogether, these represent TfN’s proposed Priority Decarbonisation Actions.

Given the enormity of the decarbonisation challenge and the risks associated with failing to achieve what is needed, the majority of activities around decarbonisation would justifiably be classed as ‘high priority’. TfN’s proposed Priority Actions , are those activities which we believe need to happen in the short-term (i.e. up to 2025) and that are most effectively delivered at a pan-Northern level.

They typically:

- recognise the transboundary nature of our surface transport system and tackle those challenges and emissions that fall between the gaps when employing a county or combined authority governance approach;
- generate evidence that can be applied usefully across a range of places by our partners (i.e. are not ‘place specific’);
- reflect preferences expressed by our partners and other stakeholders.

TfN's Proposed Activities to 2025

Table X defines TfN's proposed Priority Decarbonisation Actions by policy area. The urgency of the climate crises requires us to address all of these actions in the short term, up to 2025. There are a number of actions, typically where TfN can play an ongoing support function to others, where we envisage that support as being 'continuous', or, as and when required. Other actions are likely to have specific outputs which will require further definition and which should be delivered up to 2025.

The activities within this list present differing levels of opportunity for TfN influence, however, the role that TfN can play in delivering these activities and the relative priority assigned to actions will change over time and therefore this list will be reviewed, with our partners, on an annual basis.

Policy Area	TfN Role	TfN Decarbonisation Action	Scope	Timeframe
Decarbonisation Strategy	Demonstrating and Supporting	SD1: Regional route-map for transport decarbonisation	Disaggregating baseline emissions for a number of place typologies that typify the North. Assessing against a regional trajectory to develop place-specific policy baskets and to understand the optimum timing and resource use profiles for each typology, in order to achieve regional decarbonisation.	Pre-2025
	Demonstrating and Supporting	SD2: Developing place-based decarbonisation pathways for rural typologies.	Similar to the work proposed under the 'regional roadmap' action, although focused predominantly on the challenges and opportunities of decarbonising rural transport systems. Including development of appropriate policy baskets.	Pre-2025
	Facilitating	SD3: Formation of a decarbonisation working group with TfN partners	Working group to help scope and guide the implementation of the Decarbonisation Strategy.	Pre-2025
	Demonstrating	SD4: Exploring the relationship between transport decarbonisation and transport-related social exclusion (TRSE) (inclusive of PGA11)	Understanding the geography of TRSE in the North and the potential effects on TRSE, by place, of different transport decarbonisation policy measures. Providing evidence and strategic support (including in relation to transport-related social exclusion) to local partners to identify	Pre-2025

			locations where cycle hire and e-scooter schemes would deliver maximum environmental benefit alongside wider social, health and economic benefits.	
	Demonstrating	SD5: Research into embodied carbon analysis for strategic transport infrastructure programmes	Partnering with research bodies to investigate the requirements and feasibility of carrying out embodied carbon assessments of strategic multimodal transport infrastructure corridor proposals. We shall use a selection of schemes from TfN's existing Strategic Development Corridors for this task.	Pre-2025
	Demonstrating and Supporting	SD6: Programmatic assessment of Investment Programme (IP) against TfN Decarbonisation Trajectory	Assessment of modelled emissions as a result IP Intervention Sequencing Strategy, against TfN's Decarbonisation Trajectory to identify any additional decarbonisation policy required, and potential adjustments to IP.	Pre-2025
	Demonstrating	CGA1: Develop a regional ZEV charging strategy (inclusive of PGA1)	Identifying those facets of a low carbon charging system that are best approached at a pan-Northern level, including coverage of the Major Road Network (MRN), consistency and interoperability of technology and payment systems, procurement principles, future proofing and consideration of future grid requirements.	Pre-2025
Electric Vehicles and Fuel Efficiency	Supporting	CGA2: Supporting local partners in the development of local ZEV Charging Infrastructure	Supporting local partners in the development of local ZEV infrastructure charging plans and the pursuit of funding opportunities, through the provision of data and evidence.	Pre-2025
	Facilitating and Supporting	PGA14: Increase awareness of fuel-efficient driving styles	Through the policy positions we adopt and our communication and engagement activities, work with partners to increase public awareness of fuel-efficient driving styles and the associated environmental and financial benefits.	Continuous
	Demonstrating	CGA3: Undertake or support a pan-northern hydrogen transport refuelling study	Understanding the potential of the North's hydrogen generation/CCS potential to decarbonise transport. Mapping hydrogen network against the Strategic Road Network (SRN)/MRN and rail network (and freight depots) to identify strategic locations for investment in refuelling depots/stations.	Pre-2025

	Supporting	CGA4: Supply chain support for future hydrogen infrastructure solutions	Engaging with emerging hydrogen partnerships in the North to support the development of a viable business case for hydrogen (for both first and last mile freight applications) and provide confidence to the supply chain.	Continuous
Demand Management	Supporting	SD7: Supporting the development of scalable digital solutions for incentivising greener, shared and active mobility in rural areas.	Supporting partners, through provision of evidence and data, in understanding the key requirements of an effective rural MaaS system.	Continuous
	Facilitating and Supporting	CGA5: Supporting a Demand Management Narrative for the North	Utilising TfN's Future Travel Scenarios, combining the advantages of demand management, active travel, micro-mobility and public transport into the evolving lifestyle choices of its citizens. The objective would be to create a vocal demand for 'Liveable Places' across the various geographies of the North.	Pre-2025
	Demonstrating and Supporting	CGA6: Supporting local partners in the development of Mobility Hubs	Provision of data and evidence to facilitate analysis into potential locations for mobility hubs, in both rural and urban areas, and to access funding sources.	Pre-2025
	Demonstrating and Facilitating	PGA10: Consider role of micro-mobility/shared mobility in the first and last mile journeys at train stations	Use our role within the Rail North Partnership to facilitate a consideration of how shared mobility, including cycle hire and e-scooter schemes, can be encouraged for first and last mile journeys at train stations.	Pre-2025
	Demonstrating and Facilitating	PGA8: Develop schemes and infrastructure to improve regional public transport network, e.g. Northern Powerhouse Rail	Develop and implement comprehensive plans for the regional public transport network, such as Northern Powerhouse Rail and wider improvements to the rail network.	Continuous (and beyond 2025)
	Demonstrating	PGA9: Research on the effects of home-working upon productivity and agglomeration.	Develop an evidence base on the extent to which less work-related travel has a detrimental effect on productivity and agglomeration to understand whether home-working can be consistent with TfN's vision for a transformed Northern economy.	Pre-2025
ht Freig	Demonstrating and Facilitating	SD8: Low carbon urban freight scenarios	Research on appropriate place-based, low carbon, urban freight (last-mile) solutions in the North.	Pre-2025

	Facilitating and Supporting	CGA7: Developing and supporting partnerships to consider zero carbon, port to port freight corridors	Exploring the potential for our partners (ports, local authorities and delivery authorities) to work together to deliver effective 'port to port', multi-modal, hydrogen and/or electric refuelling corridors across our region. Many of these corridors are identified within the Strategic Development Corridors defined within TfN's Strategic Transport Plan.	Pre-2025
	Supporting	PGA2: Facilitating large ZEV truck trials in the North	Work with local authority partners and Highways England to facilitate large ZEV truck trials in high traffic corridors in the North.	Continuous
	Facilitating and Supporting	PGA3: Support partners to aggregate large orders of ZEV vans, truck and buses across the North	Current ZEV production will not meet the demand required to hit our targets. By helping to aggregate demand from stakeholders across the North, significant numbers of vehicles would be drawn to the region and would signal to manufacturers that the regional demand is present.	Continuous
	Supporting	PGA12: Supporting freight information democratisation schemes	Working with and influencing government to support information democratisation schemes that make the latest information on the best efficiency schemes and technology, available to everyone.	Continuous
Rail	Supporting	CGA8: Supporting our partners to attract testing and pilots of new low emission train technologies. Inclusive of PGA6	Work with partners, Network Rail and Train Operating Companies (TOCs) to bid for the testing and trialling of new low emission train technologies in the region. =	Continuous
	Demonstrating and Supporting	PGA4: Identify appropriate routes for electrification	Support the Government and Network Rail, and utilising the NPR project, in identifying appropriate routes for electrification and associated implementation.	Pre-2025
	Facilitating	PGA5: Work with Train Operating Companies (TOCs) and Freight Operating Companies (FOCs) to exploit operational efficiency opportunities. Incorporating PGA7	Work with train operating companies to: <ol style="list-style-type: none"> Revise service patterns based around the progression of electrification to minimise the use of diesel-only trains before they are phased out; Optimise timetables to maximise benefits of frequency and reduce flighting of services. 	Continuous

			c. Work with freight and train operating companies and Network Rail to ensure there is sufficient capacity to allow freight traffic to run directly and with minimal dwell times, reducing emissions from existing diesels.	
Project-level Carbon	Demonstrating	SD9: Developing an embodied carbon database for major infrastructure developments	Development of a project information repository to assist partners in baselining embodied carbon for major infrastructure development projects. This will include consideration of recent work by Network Rail and RSSB in this area.	Pre-2025
	Supporting	PGA13: Influence government to seek augmented DfT appraisal guidance	Influence government to seek DfT augmented Appraisal guidance on how to include for the impacts of transport projects on carbon, air quality and urban realm, and the full environmental impacts of cars.	Continuous
Awareness Raising and	Facilitating and Supporting	SD10: Engagement and awareness-raising activities	To be defined alongside partners, to understand what activities might be best undertaken at a pan-Northern level. Building on, and learning from, existing initiatives like the Leeds Climate Citizens Jury and the Lancaster district People's Jury, e.g. Leeds Act Together.	Continuous
	Facilitating	SD11: Behaviour change research	Development of a research depository and gap analysis to understand areas for further research effort.	Pre-2025

Chapter 10 - Internal assurance, monitoring and evaluation

Internal assurance

Through our internal policy framework, we shall consider the carbon implications of all our projects and programmes at their inception, to ensure we understand the implications and where appropriate, take actions to mitigate the impacts. These processes also ensure that TfN's activities are informed by the growing evidence base on the impacts of transport interventions in the North of England across a range of domains – including impacts on carbon emissions.

We also need to grasp the opportunities to achieve carbon reductions wherever we can. We expect these opportunities to occur in our development projects and through our policy-making, but also when making corporate decisions around aspects such as our ways of working, procurement activities and staff benefits.

Our internal assurance process will require the owners of TfN projects, programmes and processes to understand TfN's Decarbonisation Trajectory and assess whether their proposals are supportive of this direction of travel. **Figure X** in Chapter 2 illustrates how we intend to benchmark our Investment Programme against our Decarbonisation Trajectory, both at a strategic level and also when embarking on the development of the individual business cases of the schemes within it.

Where proposals are in relation to infrastructure development, or the procurement of supply chain services, they will also need to align with TfN's targets in relation to reducing supply chain and construction carbon.

Monitoring and evaluating our progress

When it comes to decarbonisation, the time for strategising is short and the time for delivering on our commitments is now.

Rigorous monitoring and evaluation processes will ensure that progress towards TfN's decarbonisation commitments is clearly measured, that reductions in carbon can be attributed to specific causes, and that any unforeseen consequences of this are properly analysed. These processes are vital to shaping and updating our strategies and actions over the coming decades to ensure the maximum benefits are derived, and any negative externalities are minimised.

TfN is currently developing a Monitoring and Evaluation (M&E) Strategy and Framework, which is scheduled for completion in 2021. The M&E Strategy sets out the processes necessary for a rigorous system of M&E within TfN, including how the outputs of monitoring and evaluation should inform the development and appraisal of TfN projects. Alongside this, the M&E Framework sets out the indicators by which TfN will measure progress towards the four objectives set out in the Strategic Transport Plan. Decarbonisation connects to all of

these objectives, but falls most directly within objective four: “Promoting and enhancing the built, historical and natural environment”.

Tables X and Y highlight those indicators that we have developed in relation to decarbonisation. These indicators will allow us to understand:

- The North’s progress in terms of the decarbonisation of our surface transport, allowing us to benchmark this progress against our Decarbonisation Trajectory. This is measured by the set of indicators detailed in **Table Y**.
- The success of the specific measures and actions committed to within this Decarbonisation Strategy (**Table X**).

It will be important to take stock at each milestone along our Decarbonisation Trajectory, the next being in 2025, to allow us to adjust our focus and strengthen our approach where needed.

Table X: Indicators to measure the success of TfN’s Decarbonisation Strategy

Impact: Reduce emissions from the Major Road Network in the North.		
Measure: Annual estimates from TfN NoCarb model.		
Outcomes	Outputs	Activities
<p>Rollout of sufficient low carbon charging network to meet trajectory. (M: To be set based on the infrastructure plan).</p> <p>Rollout of sufficient hydrogen refuelling network to meet trajectory. (M: To be set based on the infrastructure plan).</p> <p>Modal shift away from private car travel, towards active travel and public transport. (M: NTS, and datasets on MaaS uptake where these are developed).</p> <p>Increased occupancy levels among car users for journeys in and through the North. (M: DfT statistics).</p> <p>PGA14: Increasing fuel efficiency among drivers (M: To be developed).</p>	<p>SD1: Regional route-map for transport decarbonisation (M: Route-map signed off by stakeholders)</p> <p>SD2: Place-based decarbonisation pathways for rural typologies. (M: Pathways signed off by stakeholders)</p> <p>CGA1 & PGA1: A regional ZEV charging strategy (M: Strategy signed off by stakeholders)</p> <p>CGA5: A Demand Management Narrative for the North (M: Narrative signed off by stakeholders)</p> <p>PGA8: Develop schemes and infrastructure to improve regional public transport networks, e.g. Northern Powerhouse Rail. (M: Delivery of schemes identified at the planning stage).</p>	<p>SD3: Formation of a decarbonisation working group with TfN partners.</p> <p>SD4 & PGA11: Research on the relationship between transport decarbonisation and transport-related social exclusion (TRSE).</p> <p>SD6: Assessment of Investment Programme (IP) against TfN Decarbonisation Trajectory.</p> <p>SD10: Engagement and awareness-raising activities with the public.</p> <p>CGA2: Research and evidence to support the development of local ZEV Charging Infrastructure.</p> <p>CGA3: Research and evidence to support pan-northern hydrogen transport refuelling study.</p> <p>SD7: Research and evidence to support the development of scalable digital solutions for incentivising greener, shared and active mobility in rural areas.</p>

		<p>CGA6: Research and evidence to support local partners in the development of Mobility Hubs.</p> <p>PGA9: Research and evidence on the effects of home-working upon productivity and agglomeration.</p> <p>PGA10: Research and evidence to consider role of micro-mobility/shared mobility in the first and last mile journeys at train stations.</p> <p>SD11: Research and evidence on behaviour change and transport user insights.</p> <p>PGA8: Develop and implement comprehensive plans for the regional public transport network, such as Northern Powerhouse Rail and wider improvements to the rail network.</p>
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<p>Impact: Reduce emissions from land freight transportation in the North.</p> <p>Measure: Annual estimates from TfN NoCarb model.</p>		
Outcome	Output	Activity
<p>Rollout of sufficient low carbon charging network to meet trajectory. (M: To be set based on the infrastructure plan).</p> <p>Rollout of sufficient hydrogen refuelling network to meet trajectory. (M: To be set based on the infrastructure plan).</p> <p>Modal shift towards rail freight (M: Great Britain Freight Model).</p> <p>Increasing fuel efficiency among drivers (M: To be developed).</p>	<p>SD1: Regional route-map for transport decarbonisation. (M: Route-map signed off by stakeholders)</p> <p>CGA1 & PGA1: A regional ZEV charging strategy. (M: Strategy signed off by stakeholders)</p> <p>PGA3: Aggregated large orders of ZEV vans, truck and buses across the North. (M: Number of ZEV units ordered through aggregated partnerships)</p>	<p>SD3: Formation of a decarbonisation working group with TfN partners.</p> <p>SD8: Research and evidence to inform appropriate place-based, low carbon, urban freight (last-mile) solutions in the North.</p> <p>CGA7: Developing and supporting partnerships to consider zero carbon, port to port freight corridors.</p> <p>CGA3: Research and evidence to support a pan-northern hydrogen transport refuelling study.</p> <p>PGA2: Facilitating large ZEV truck trials in the North.</p> <p>PGA12: Supporting freight information democratisation schemes.</p>

Impact: Reduce operational emissions from the North's rail network		
Measure: Annual estimates from TfN NoCarb model.		
Outcome	Output	TfN action
<p>Rollout of sufficient hydrogen refuelling network to meet trajectory. (M: To be set based on the infrastructure plan).</p> <p>Upgrades to conventionally powered trains to reduce emissions. (M: Estimated emissions reductions achieved through upgrades).</p> <p>Increased electrification of the rail network. (M: Proportion of the network electrified).</p> <p>Increased operational efficiency of the rail network. (M: To be developed based on linked area of research)</p>	<p>SD1: Regional Road Map for Decarbonisation. (M: Road map agreed by key stakeholders).</p> <p>CGA3: Pan-Northern hydrogen refuelling network infrastructure plan. (M: Plan agreed by key stakeholders.)</p> <p>National regulatory and legislative changes. (M: Register of policy changes in key identified areas).</p>	<p>SD3: Formation of a decarbonisation working group with TfN partners.</p> <p>PGA4: Identify appropriate routes for electrification and associated implementation.</p> <p>PGA5 & PGA7: Work with Train Operating Companies (TOCs) and Freight Operating Companies (FOCs) to identify operational efficiency opportunities.</p> <p>CG8: Supporting our partners to attract testing and pilots of new low emission train technologies</p>

Impact: Reducing supply chain and construction carbon linked to transport in the North.

Measure: Use of PAS 2080 Carbon Management Framework.

Outcome	Output	TfN action
<p>Reduction in supply chain/construction carbon on TfN-led schemes. (M: Use of PAS 2080 Carbon Management Framework on TfN-led schemes).</p>	<p>SD9: An embodied Carbon Database for Major Infrastructure Developments. (M: Database developed and subject to peer review)</p> <p>National regulatory and legislative changes. (M: Register of policy changes in key identified areas).</p>	<p>SD3: Formation of a decarbonisation Working Group.</p> <p>PGA13: Increased efforts to influence national appraisal guidance, national regulatory and legislative changes, and effective policymaking.</p> <p>SD9: Research on challenges and opportunities for carbon reduction in the construction sector.</p>

Table Y, Decarbonisation related indicators within TfNs Monitoring and Evaluation Framework.

Indicator	Baseline	Data source	Update frequency
Millions of tonnes of CO2 emitted by cars per year	14.6326 (2018)	TAME NoCarb model	5 years
Millions of tonnes of CO2 emitted by HGVs per year	7.2467 (2018)	TAME NoCarb model	5 years
Millions of tonnes of CO2 emitted by LGVs per year	2.7403 (2018)	TAME NoCarb model	5 years
Millions of tonnes of CO2 emitted by buses per year	0.6279 (2018)	TAME NoCarb model	5 years
Millions of tonnes of CO2 emitted by rail per year	0.7659 (2018)	TAME NoCarb model	5 years
The proportion of vehicle kilometres travelled by battery electric cars	0.08% (2018)	TAME NoCarb model	5 years

Decarbonisation Strategy

February 2021



Contents

- 3 Chapter 1: Introduction**
- 8 Chapter 2: TfN's Decarbonisation Trajectory**
- 14 Chapter 3: Estimating current and future emissions**
- 32 Chapter 4: Decarbonisation Pathways**
- 34 Chapter 5: Policy analysis (in progress)**
- 36 Chapter 6: Consideration of embodied carbon**
- 40 Chapter 7: Climate change adaptation and resilience**
- 48 Chapter 8: Clean growth opportunities (in progress)**
- 50 Chapter 9: TfN's priority actions to 2025**
- 62 Chapter 10: Internal assurance, monitoring and evaluation**



Introduction

The science is conclusive - the world is facing a climate emergency.

In the UK, transport is the largest contributing sector to greenhouse gas emissions, accounting for 22% of all emissions in 2019¹, of which more than 95% are from road transport. Furthermore, transport emissions have continued to grow since 2013.

Whilst it is possible that 2020 figures will show a drop in emissions due to reduced levels of travel during the COVID-19 lockdown, this is likely to be temporary, with demand for car travel rebounding more quickly than public transport, approaching pre-pandemic levels.

In our Strategic Transport Plan, published in 2019, Transport for the North (TfN) committed to scoping, developing and implementing a 'Pathway to 2050' in line with the then UK law of achieving an 80% reduction in national emissions by 2050 (now superseded by the current UK Government commitment to achieve net zero emissions by 2050). For the surface transport sector, this meant that road transport emissions would need to be near-zero and rail would need to be decarbonised by 2050.

TfN and our partners believe that an acceleration towards a zero-carbon transport network must be at the heart of public policy-making and investment decisions. Our ambition for the North is to travel faster and further than national policy and maximise the clean growth opportunities that decarbonisation can provide for the North. Through this Decarbonisation Strategy, TfN and our partners are committing to a regional near-zero carbon surface transport network by 2045.

The achievement of TfN's vision of a thriving North of England, where world class transport supports sustainable economic growth, excellent quality of life and improved opportunities for all, is contingent on how we can reduce our greenhouse gas emissions across everything that we do, and then, making the right decisions at the right time.

22%
Transport sector's contribution to greenhouse gases in 2019

95%
of greenhouse gases come from road transport

¹This relates to surface transport and does not include emissions from aviation and international shipping.

The Role of TfN

Through its statutory powers, TfN acts as 'one voice' for the North, communicating pan-Northern priorities to the Secretary of State for Transport. We have a clear remit to identify the transport infrastructure required to support transformational economic growth in the North, and to prioritise that investment. This places TfN and partners in a strategic position to identify the transport infrastructure and policy measures that are required to achieve the North's decarbonisation ambitions.

When prioritising transport infrastructure delivery in the region, TfN must make decisions based on a knowledge of how those projects and programmes are likely to support or challenge the region's decarbonisation objectives. This Decarbonisation Strategy provides a tool to robustly consider how our Investment Programme is performing in this respect. It will also provide guidance to support an appropriate sequencing of those investments and the mitigation actions that may be needed to deliver transformational economic growth in line with decarbonisation ambitions.

While most of the responsibility for policy implementation lies with national and local government, TfN operates at a geographical and institutional level that allows us to facilitate a regional approach to decarbonisation measures and research, for example, developing a series of pan-regional low-emission vehicle charging network principles. Indeed, a high proportion of the emissions from private road vehicles is generated by longer distance regional-level trips, with our analysis indicating that around 60% of road transport emissions in the North originate from trips on the Major Road Network. This means TfN has both an opportunity and a responsibility to help reduce this significant share of road transport emissions.

TfN is also uniquely placed to assist our partners in the development of place-based solutions by analysing emissions at a more disaggregate level and providing enhanced evidence, data platforms and intelligence to inform bespoke local and regional strategies. This can, in turn, support national policies to take account of spatial and social variation.

At a project level, TfN has a responsibility to ensure that the design and construction of our projects and programmes reduce lifecycle carbon and to encourage partners to adopt similarly ambitious policies.

The North is also extremely well placed to support the testing and trialling of many emerging technologies that will be crucial to transport decarbonisation in the UK, including through existing initiatives such as the UK's first Hydrogen Transport Hub in the Tees Valley, Zero Carbon Humber, and HyNet North West. Through partnerships and co-working with Local Authorities, Local Enterprise Partnerships, transport providers and regional academic and industry players, TfN is committed to promoting the North as hub for innovation, research and the testing of emerging technologies.

Finally, TfN needs to lead by example. Whilst the focus of this strategy is upon understanding, measuring and reducing the emissions from surface transport in the North, and the construction and operation of the proposed schemes within our Investment Programme; it is important that we look to reduce the emissions resulting from TfN directly as a result of our everyday business. These are called our 'organisational emissions'.

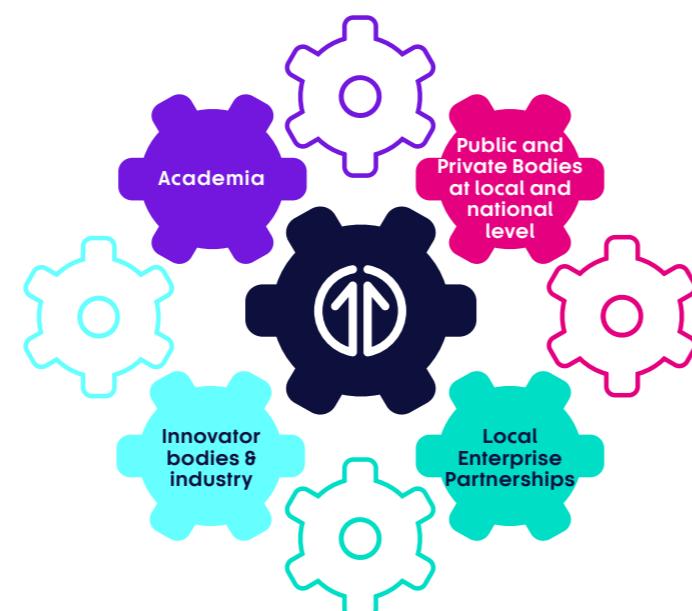
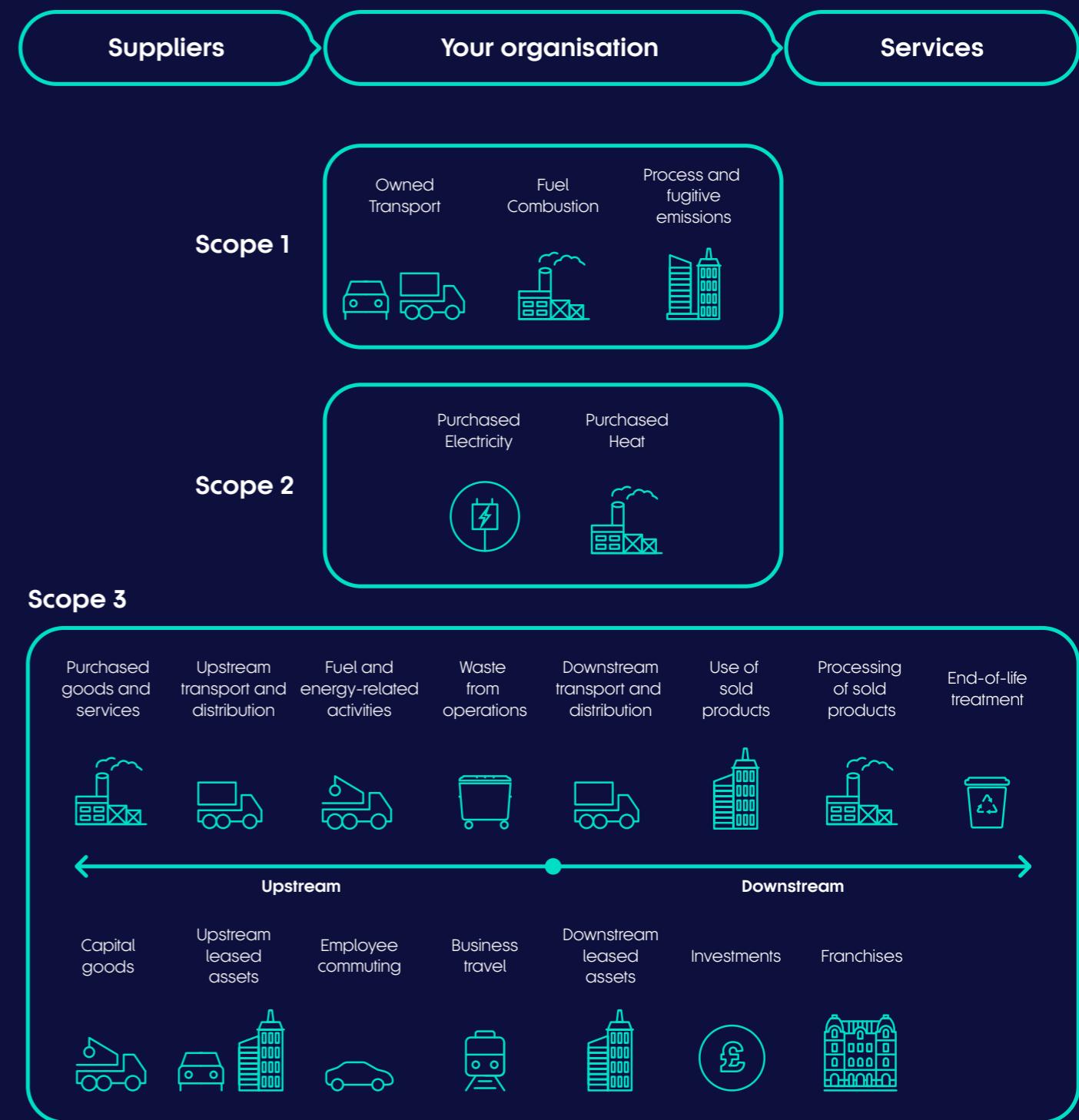


Figure XXX, Carbon Footprinting – Organisational Barriers²



² Image sourced from Carbon Trust and The Greenhouse Gas Protocol, 'A Corporate Accounting and Reporting Standard, Revised Edition' (2004).

The Role of TfN

The full range of activities and goods, through which an organisation might generate greenhouse gas emissions, is illustrated in [Figure XXX](#). These emissions sources are split into three types – known as Scope 1, 2 and 3. Different emissions sources will be of relevance to different types of organisations, particularly in relation to Scope 3. For TfN, these organisational emissions are likely to include:

- Scope 1 emissions, which are direct emissions resulting from activities that TfN can control, such as the gas used to heat our offices.
- Scope 2 emissions, which are indirect emissions resulting from the generation of any power that we use within our offices.
- Scope 3 emissions, which cover indirect emissions as a result of our operations that are outside of TfN's direct control. This includes things like the emissions from the manufacture and transport of goods we use, like stationery and IT equipment, and also services we purchase, like cleaning and catering. It also includes emissions generated by our employees' commuting and business travel, along with those generated by the disposal of our waste and our water consumption.



TfN is committed, by 2022, to understanding the carbon footprint of its organisational Scope 1 and 2 emissions and agreeing a target date for reducing these emissions to net-zero.

In the same timeframe, TfN will also develop a suitable carbon footprint scope for measuring its organisational Scope 3 emissions. This will reflect data availability, our environmental goals and the sources we can influence.

Emissions generated from the design, construction and operation of schemes within our Investment Programme, along with changes to the emissions generated by surface transport in the North as a result of TfN activity, are the main focus of this strategy document. Our approach to measuring these emissions and our Decarbonisation Trajectory are covered within Chapters 2 to 6.

Why a Decarbonisation Strategy?

To achieve a near-zero emissions surface transport network in the North by 2045, there must be a clear understanding of the policies and measures required to bridge the gap between future emissions projections and future emissions targets. TfN's Decarbonisation Strategy reflects work undertaken to define four plausible baseline emissions trajectories, based on our Future Travel Scenarios, and to identify and assess the gap between each trajectory and TfN's Decarbonisation Trajectory.

We have also undertaken a policy analysis to understand the policy ambition and suite of policy measures that could fill the policy gap for each scenario. This provides insights into the key, low-regret policy measures required under all scenarios, as well as the areas where TfN and partners are likely to require additional national support to achieve decarbonisation ambitions.

It is hoped that this guidance is of use to our partners and other organisations across our region.

Building upon these findings, this strategy lays out the North's minimum expectations in relation to both local and national decarbonisation policy ambitions. It is intended to provide an overarching framework for our partners and other organisations across the region to meet their decarbonisation responsibilities and ambitions.

The Strategy also recognises the importance of considering embodied carbon and climate change adaptation and resilience, drawing on the experience of our delivery partners, Highways England and Network Rail, in these areas.

Finally, this strategy outlines TfN's key commitments to enabling the decarbonisation of surface transport in the North. Developed through research and engagement with partners, regional research bodies and industry, these relate to activities that would benefit from coordination at the regional level and can be most effectively undertaken by TfN. As part of this analysis, a key consideration for TfN has been how the decarbonisation of transport can support our partners' economic growth ambitions, championing clean growth opportunities across our region. Cross-sectoral co-operation and planning will be essential if the North is to deliver both a decarbonised transport system and capitalise on the possibilities from green industrial revolution, especially with the energy generation and distribution sector.

The timeline for undertaking these activities is outlined within Chapter 9, Priority Actions to 2025.

This strategy builds upon the four objectives in TfN's Strategic Transport Plan:

- **Transforming economic performance:** We want to understand the full range of clean growth opportunities within the North as a result of transport decarbonisation.
- **Increasing efficiency, reliability, integration and resilience in the transport system:** We want to integrate decarbonisation measures into existing and future programmes and projects in order to maximise efficiency and reliability gains (such as the electrification of our railway network). We also need to ensure that climate change adaptation and resilience is a key consideration in policy and project development.
- **Improving inclusivity, health and access to opportunities for all:** The decarbonisation of transport in the North provides an important opportunity for reducing transport-related social exclusion. We want to ensure that decarbonisation measures optimise co-benefits relating to physical health, improved air quality and increasing levels of mobility for all communities and areas in the North.
- **Promoting and enhancing the built, historic and natural environment:** While environmental conservation is the ultimate driver for decarbonisation, we need to consider the localised impacts of decarbonisation policies and measures. For example, local air quality, reduced noise levels, and the environmental impact of new infrastructure and operations required as part of the decarbonisation agenda (e.g. electrification infrastructure).

TfN's Decarbonisation Trajectory

What is TfN's Decarbonisation Trajectory?

Our route to a decarbonised transport system is illustrated by a measurable, evidence based and time-bound carbon emissions reduction curve, which starts with 'where we are now' and travels towards alignment with the objectives of the Paris Agreement, i.e. deep emissions reductions over the coming decades towards a zero-emissions transport system before 2050.

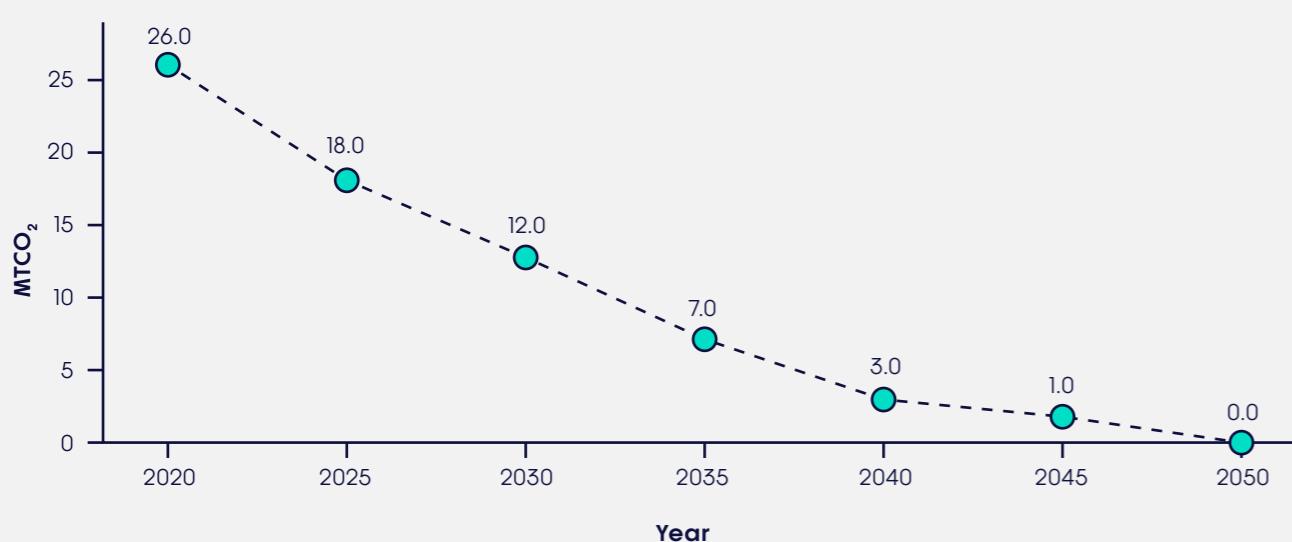
That journey is called our Decarbonisation Trajectory, with the shape of the curve being dictated by a series of interim emissions reduction milestones that ensure a rate of progress aligned to the Climate Change Committee's Carbon Budgets as a minimum.

Our agreed Decarbonisation Trajectory is shown in Fig X, with the headlines being:

- A 55% reduction in emissions from 2018 to 2030, achieved mostly through mode-shift and demand reduction.
- An 90% reduction in emissions from 2018 to 2040, reflecting longer-term decarbonisation measures, such as a high proportion of zero-emissions vehicles in the vehicle fleet.
- A close to zero date of 2045 for carbon emissions from surface transport in the North. This is a challenging benchmark reflecting the ambition of our partners and their desire to push further and faster than current national policy.

The scope of the emissions included within the trajectory is described below.

Figure X: TfN's Decarbonisation Trajectory



Why 2045?

A decarbonisation trajectory set at a regional scale is, by its nature, a compromise between areas that have set different decarbonisation timescales and have different geographies, demographics and patterns of passenger and freight demand.

A number of our partners have set ambitious, economy-wide decarbonisation targets with net-zero dates pre-2040 for their authority areas. The contribution of transport emissions reductions to these economy-wide targets will depend on progress in other sectors and the assumed availability of negative emissions measures, but it is clear that these authorities are aiming for transport emissions close to zero by 2040.

In preparing a Decarbonisation Trajectory, TfN seeks to achieve a compromise by moving faster than current national policy and the Climate Change Committee's advised trajectory, while being mindful of the varying levels of progress that our partners have made in terms of their own climate change responses. In this way, TfN's Decarbonisation Trajectory considers the ambitions of the whole region, but does not override or specify local place-based targets.

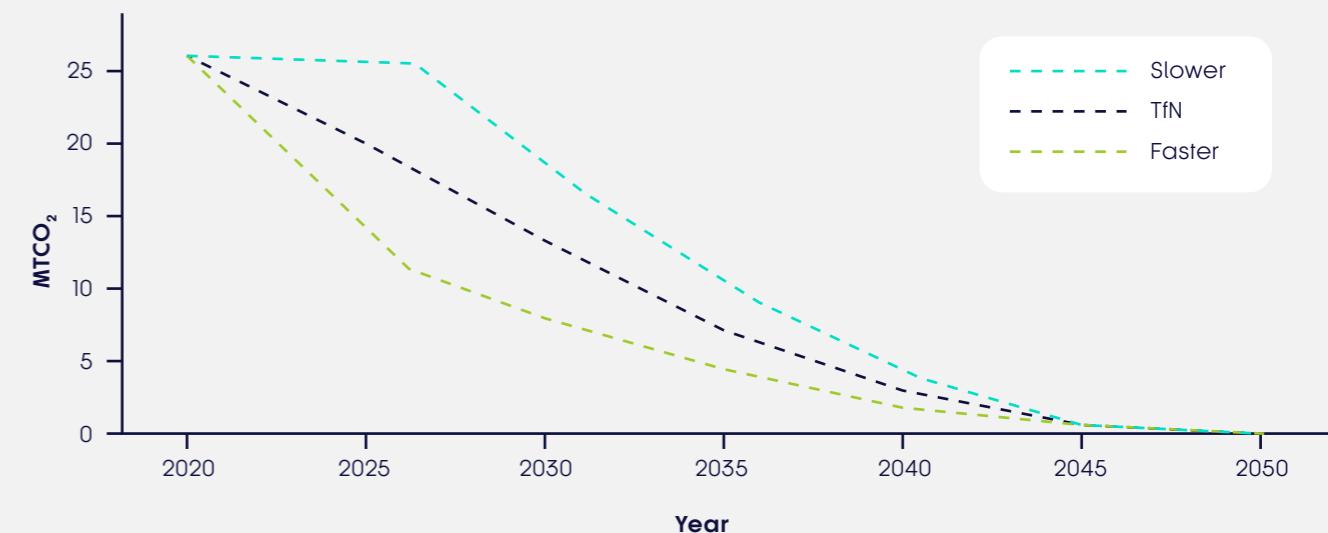
Indeed, the deep emissions reductions achieved by our most ambitious partners over shorter timescales will be needed if the region is to align itself, as a whole, with the level of reductions suggested by TfN's Decarbonisation Trajectory.

The interim points along our trajectory effectively represent an average for the region, with some areas' local transport systems decarbonising more quickly, while some may decarbonise slightly slower. The end point of our Decarbonisation Trajectory means that by 2045, emissions from surface transport in the North will need to be close to zero.

Figure X illustrates how different places within the North may move ahead with different trajectories, helping to achieve an average regional trajectory, but with all places reaching close to zero by the agreed end date.

Aligned to this, the programmes and projects that together make up TfN's Investment Programme should collectively emit close to zero carbon dioxide emissions by 2045. It is also true that many of these projects and programmes may actively help reduce emissions in the short term, for example, rail schemes may lead to a reduction in car vehicle and road freight mileage. This consideration will be important as we look to benchmark ourselves against our trajectory over the coming decades.

Figure X: TfN's Decarbonisation Trajectory reflects an average across local authorities that can decarbonise slightly slower or slightly faster



What is included in our trajectory and why

TfN's Decarbonisation Trajectory comprises emissions from surface transport sources. This includes cars, vans and Heavy Goods Vehicles (HGVs), as well as bus and rail.

In recognition of TfN's remit, the Decarbonisation Trajectory relates to emissions from vehicle mileage that takes place on the transport network within the North, including through trips (e.g. Scotland to the South of England), as illustrated by the orange roads in [Figure X](#).

Other forms of transport with significant emissions profiles include aviation and shipping (both domestic and international), which together accounted for 10% of the UK's total emissions in 2018 (compared to 23% from surface transport sources). Seven percent of this was generated from aviation, of which 93% was from international aviation.

As these modes lie outside of TfN's jurisdiction, emissions from aviation and shipping are not accounted for within TfN's Decarbonisation Trajectory. Nevertheless, we recognise the need for aviation and shipping to be included in national targets and for strong national strategy in this area which aligns the UK aviation strategy with the Paris Agreement.

TfN believes that the emissions from all flights from airports in the North need to be fully aligned with the requirements of the Paris Agreement. This means operating within a defined carbon budget for UK aviation as part of a wider international budget.

Some residual emissions from aviation and shipping are assumed within the current Government target of net-zero emissions, for the whole economy, by 2050. It is important to note that by excluding aviation and shipping from our trajectory, surface transport emissions will need to be zero by 2050.

TfN's Decarbonisation Trajectory, set at a regional level, also recognises the importance of scale when attributing longer distance journeys against decarbonisation budgets of smaller areas of spatial governance. For example, some authorities with relatively small populations may be assigned relatively large emissions because they happen to have a segment of motorway that passes through their boundary, or a large source of traffic, such as a seaport. If through traffic dominates local traffic, the ability of that authority to influence the carbon outcomes are low.

Similarly, a smaller authority may choose to discount emissions from through traffic from their decarbonisation plans, resulting in the responsibility for considering those emissions slipping between the gaps of different areas and levels of spatial governance.

[Figure X](#), compiled from National Travel Survey data, demonstrates that although approximately 95% of passenger trips (all modes) occur at a spatial scale that would suit consideration by a district, county or combined authority, these trips only account for about 65% of all miles travelled.

The remaining 35% of total miles travelled occur on journeys over 35 miles in distance, and whilst some of the longest trips would extend even outside of a pan-Northern focus, the majority of trips over 35 miles will be best considered at a pan-Northern level.

¹ Source: Addel, M., Wadud, Z. and Anable, J. 'An exploratory analysis of long distance travel in England', 99th Annual Meeting of the Transportation Research Board (TRB), Jan 2020, Washington DC.

Figure X: Percentage of trips (all modes) and percentage of all miles, by trip length¹

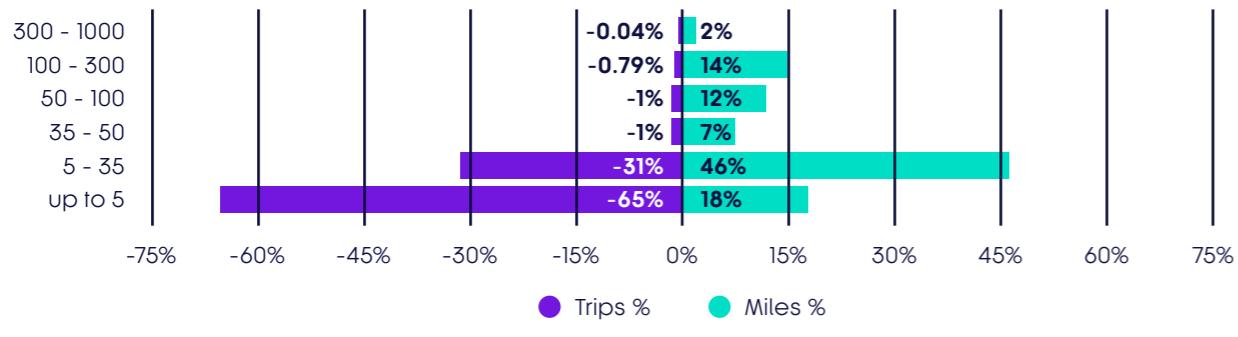


Figure X: Map of the Northern boundary in which TfN operates. The white section represents the areas that TfN covers and the orange roads represent the key roads within this boundary.



Providing guidance

To understand the impact of our Investment Plan in terms of carbon emissions, we need to understand a number of things:

- Where are we likely to be living and working in the future, and what will our travel habits and patterns look like?
- What national and local transport policy is likely to be in place that may affect the carbon emissions of transport?

Once we understand the answers to these two questions, we can work out the approximate carbon emissions from surface transport at a number of set points in the future. These are our future baseline emissions, and when you join these points together, it forms our baseline trajectory.

Of course, the future is not certain, and for that reason TfN has created and modelled a number of Future Travel Scenarios. These scenarios have given us the ability to calculate transport emissions change by scenario and area type - providing four plausible baseline emission trajectories. We will add to these any increase or reduction of emissions stimulated by our projects and programmes within our Investment Programme at any given point. Chapter 3 explains more about the characteristics of each Future Travel Scenario and how they have been used.

If our baseline trajectories, plus any emissions changes as a result of our Investment Programme, exceed our Decarbonisation Trajectory at any point in the future, the gap between the two is known as the Policy Gap. As part of the preparation of this strategy, TfN has modelled the Policy Gap for a number of interim points along the Decarbonisation Trajectory.

This Decarbonisation Strategy sets out how these Policy Gaps may be addressed through two main areas:

- Identification of additional local policy commitment required to achieve the Decarbonisation Trajectory.
- Identification of additional national policy commitment required to achieve the Decarbonisation Trajectory.

The identification of required additional policy commitment is important as it helps TfN and its partners evidence and illustrate the additional support required from national government to achieve our decarbonisation ambitions as a region.

How we use our trajectory

This support could be in the form of additional national policy or Government provision of more devolved funding or powers. Chapter 4 sets out the change in policy commitment that we believe is required to bridge the policy gap found in each Future Travel Scenario, and Chapter 5 identifies and provides qualitative guidance on the measures that are likely to be required to achieve those policy commitments.

Making the right decisions

At a strategic level, we need to understand how TfN's Investment Programme affects the future projected emissions from surface transport in the North.

The Investment Programme is due to be appraised against a number of environmental, social and economic objectives to arrive at a preferred mix of schemes. Changes to surface transport emissions generated in the North, as a result of these schemes will be modelled so that we understand what local and national decarbonisation policy commitment will be required at different points in the future to allow the schemes to be delivered within the parameters of TfN's Decarbonisation Trajectory. Ultimately, we will be asking the question: 'what needs to be true, if the North is to effectively decarbonise its surface transport as well as enjoy the significant connectivity, economic and environmental benefits that our IP will deliver?'

Recognising that the development of local and national policy is ultimately the responsibility of our partners and national government respectively, and that our actual future travel habits may occur differently from the four plausible Future Travel Scenarios we have modelled, TfN will embed consideration of our Decarbonisation Trajectory within the business case development process for individual projects within our Investment Programme.

This means that when the time comes to start to develop each individual project, over the next 30 years, we shall assess whether the carbon impact of the project is consistent with the Decarbonisation Trajectory, given the prevailing external policy context, travel habits and patterns. Recognising the detailed, and sometimes extended, consenting and design processes that precede the construction of major infrastructure projects, we shall assess the carbon impact of the project at both the concept / early design stage and then again once the detailed design is known, pre-construction.

In relation to the early design stage assessment, where a project may not deliver operational emissions in line with our Decarbonisation Trajectory, TfN will require mitigation measures to be developed as part of the project. Mitigation could take the form of fundamental design changes, influencing national government for further policy support or implementation of further local transport decarbonisation policy measures.

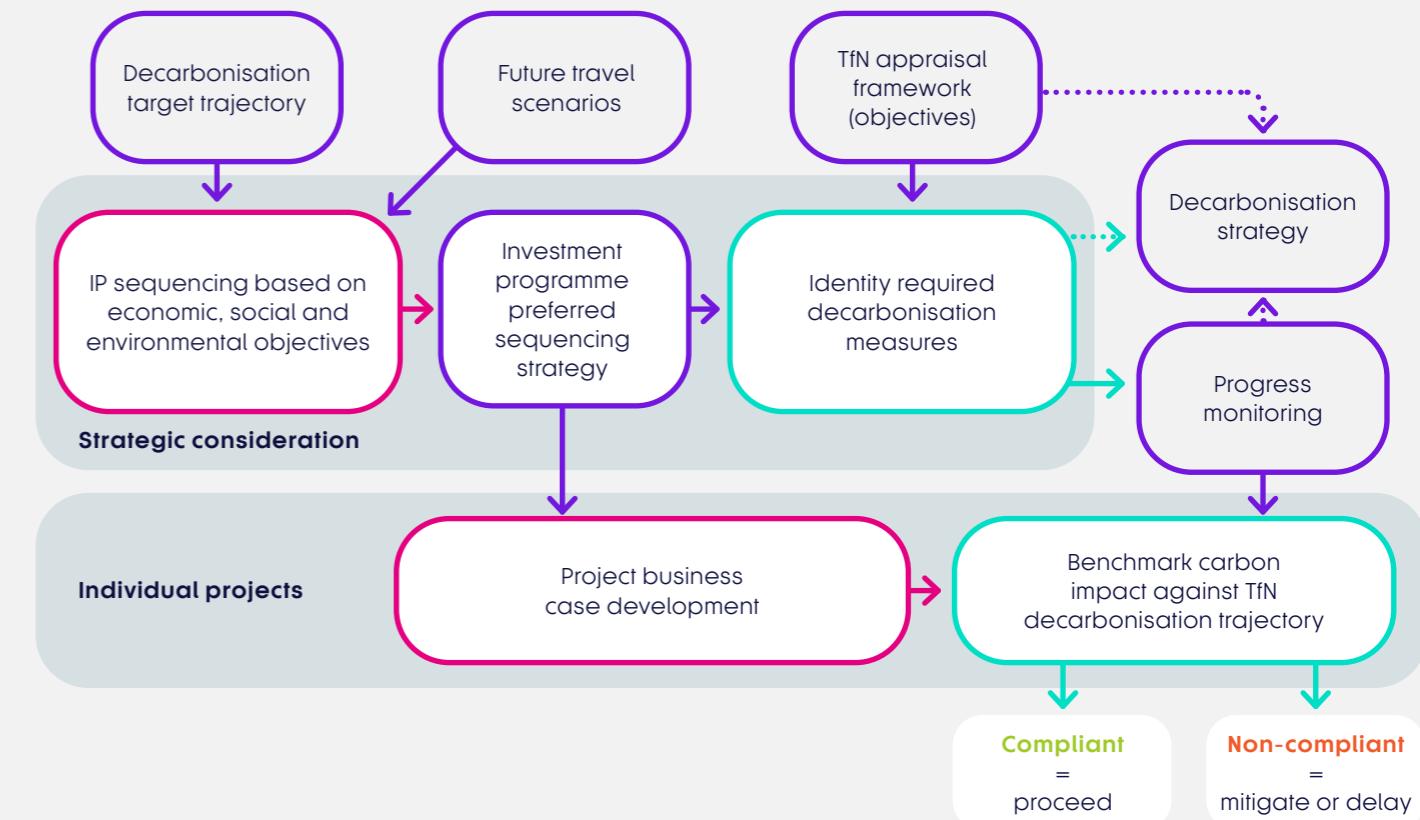
Following detailed design and before the start of construction, we will model the expected changes to surface transport emissions in the North during the expected year of opening to understand the potential success of any mitigation measures employed.

If those changes to emissions are not consistent with our decarbonisation trajectory, we shall consider additional mitigation measures such as investigating further options to provide the same transport outcomes, through to employing carbon sequestration measures such as integrating tree planting into schemes or investigating the feasibility of using innovative carbon 'absorbing' construction materials.

If it is not possible to mitigate the project's impact upon emissions, the delivery of the project may be re-sequenced within the Investment Programme to a date when the future travel context enables the project to operate within the Decarbonisation Trajectory. For example, a particular road project may be re-scheduled to a point when the majority of additional traffic generated is by zero emission vehicles.

Our approach to incorporating the consideration of our Decarbonisation Trajectory within our decision making at both a strategic and project level is illustrated in [Figure X](#).

Figure X: Framework for assessing a project against TfN's Decarbonisation Trajectory



Estimating current and future emissions

Estimating current and future emissions is key to identifying the policy gap between baseline and decarbonisation trajectories. TfN's Northern Carbon Modelling Tool, NoCarb, was developed for this purpose, taking in historic demand, fleet and emissions data as well as those associated with TfN's Future Travel Scenarios.

This chapter outlines the context and rationale behind TfN's Future Travel Scenarios, and how they have been used through our Decarbonisation Pathway work as a tool for exploring plausible futures for which emissions can be estimated. As the starting point for all four Future Travel Scenarios, the chapter goes on to outline baseline emissions estimates for 2018, before presenting the unique emissions trajectory of each Future Travel Scenario.



Future Travel Scenarios

TfN's Future Travel Scenarios explore how trends in society, the economy and national policy could influence the level and distribution of travel demand in the future. By using a series of different Future Travel Scenarios, we aim to future-proof our decision-making as much as possible, making it resilient to wide-ranging and cross-sector uncertainties.

The Future Travel Scenarios represent factors¹ that are external to TfN's direct control, acting as 'reference cases' to test the performance of TfN strategies and policies against objectives. They form the starting point for TfN's Decarbonisation Pathways.

In each scenario, the level of national government ambition and support for decarbonisation in the North is different, as is the level and distribution of travel demand².

Assessing the decarbonisation 'policy gap' - that is, the gap between each Future Travel Scenario's emissions trajectory and the decarbonisation trajectory - will allow TfN to develop a resilient Decarbonisation Strategy that can adapt to different future circumstances. The policies and measures that are likely to bridge this policy gap are captured in TfN's Decarbonisation Pathway, which address the different levels of additional action required under each of TfN's four Future Travel Scenarios, recognising that the same action applied in different scenarios will result in different levels of efficacy in terms of the emissions reductions required.

The Future Travel Scenarios were developed in partnership with Local Authority partners, national delivery partners and academic experts and informed by local strategies and priorities. The scenarios represent uncertainty across the following five external factors:

1. Growth in the population and economy;
2. Spatial planning policy and economic distribution;
3. National policy on environment and sustainability;
4. Technological change and advancement; and
5. Social and behavioural change.

The key elements of the scenarios can be summarised using the following set of 'what if' questions:

→ **Scenario 1: Just About Managing** – What if society keeps developing broadly following existing trends? What if there is a gradual shift in lifestyles and travel, public and political behaviours do not alter, and we don't give up certain 'luxuries', leaving major developments and change to be shaped by market forces.

→ **Scenario 2: Prioritised Places** – What if society becomes focused on quality of life, place-making and community, rather than primarily economic growth? This scenario is led by a change in priorities, with its biggest driver being the push for a fairer redistribution of economic prosperity.

→ **Scenario 3: Digitally Distributed** – What if Northern Powerhouse ambitions³ are realised by using technology solutions to create connections and agglomeration across towns and cities? This scenario is led by technology and some policy influence, as we fully embrace technological change, work remotely, and use an accessible service-based transport system with connected and autonomous shared mobility options.

→ **Scenario 4: Urban Zero Carbon** – What if society achieves Northern Powerhouse ambitions by using policy interventions to maximise energy efficient city growth and urban densification? This scenario is led by public and political attitudes to climate action and urban place-making, with the biggest drivers being strong government policy, resulting in fast action on zero-emission transport systems and places, with integrated planning across energy, spatial and other sectors.

TfN's Future Travel Scenarios Report provides a comprehensive overview of the process undertaken to develop the new Future Travel Scenarios. It also delves into the contextual factors underlying each scenario and the expected implications on transport.

¹A list of travel-related development, policies and measures under each Future Travel Scenario can be found in the Future Transport Measures and Solutions Annex.

²Key national policy changes up to December 2020 are reflected within the scenarios.

³As set out in the [Northern Powerhouse Independent Economic Review](#).

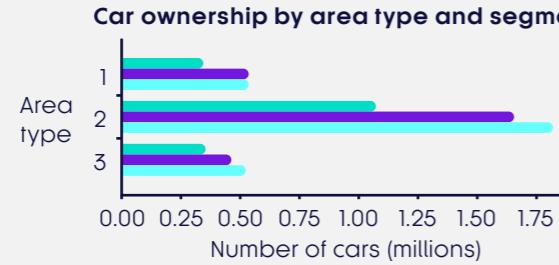
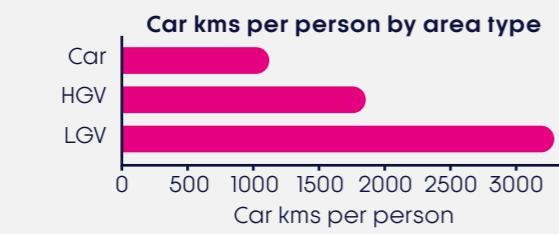
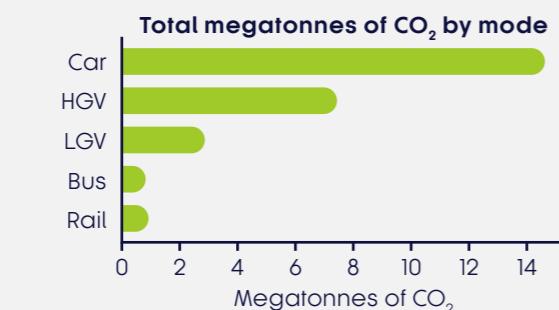
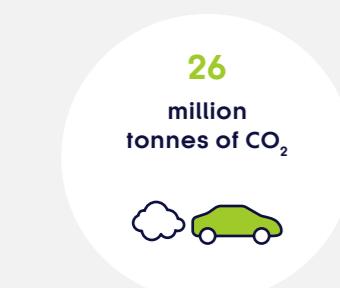
Modelling carbon emissions in the North

Over the past two years, TfN's Technical Assurance, Modelling and Economics (TAME) team has been developing and refining the Analytical Framework; a consistent set of data, modelling tools and appraisal approaches designed for TfN's programmes of transport strategy and business case development. TfN's NoCarb model forms part of the Analytical Framework and draws on other framework elements and data sources to estimate future vehicle emissions. These inputs relate to:

1. The composition of the vehicle fleet by size and fuel type;
2. The distribution of travel demand;
3. Emissions per kilometre travelled for each distinct type of vehicle.

Figure X: Headline figures related to surface transport emissions in the North in 2018.

Page 18
13



Using these inputs, NoCarb carries out two core functions:

1. Projecting the make-up of future fleets using sales scenarios; and
2. Calculating emissions using fleet, emissions and demand inputs.

The first step involves projecting the make-up of the vehicle fleet under each of TfN's Future Travel Scenarios, while the second step estimates emissions based on the composition of the fleet and distance travelled in a given year. Estimates of kilometres travelled by each vehicle type under each of the Future Travel Scenarios were produced using TfN's travel demand modelling tools. Further information on NoCarb and these travel demand modelling tools is provided in Annex X.

Baseline emissions in the North

Figure X provides headline figures related to baseline surface transport emissions in the North. At 26 mega-tonnes of CO₂, surface transport emissions in the North represent nearly one quarter of UK road emissions and 6% of total UK emissions. Over half of those emissions were generated by cars, with HGVs and vans producing 28% and 11% of surface transport emissions respectively. Bus and rail, on the other hand, represent just 5% of emissions.

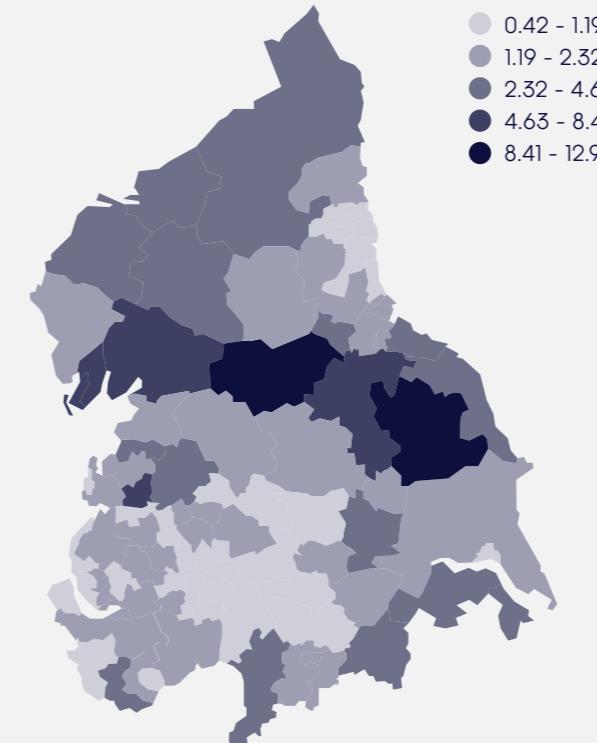
A total of 126 billion kilometres were travelled in the North in 2018, representing 23% of vehicle kilometres travelled in the UK. The majority of the North's travel was through sub-urban areas, though distance per head was much higher for those in rural areas.

The North had 8 million registered cars in 2018. Large and SUV cars, which typically have higher emissions intensity, made up nearly one quarter of those cars. This reflects a national trend over the last two decades, which has seen a gradual increase in the purchase of larger cars.

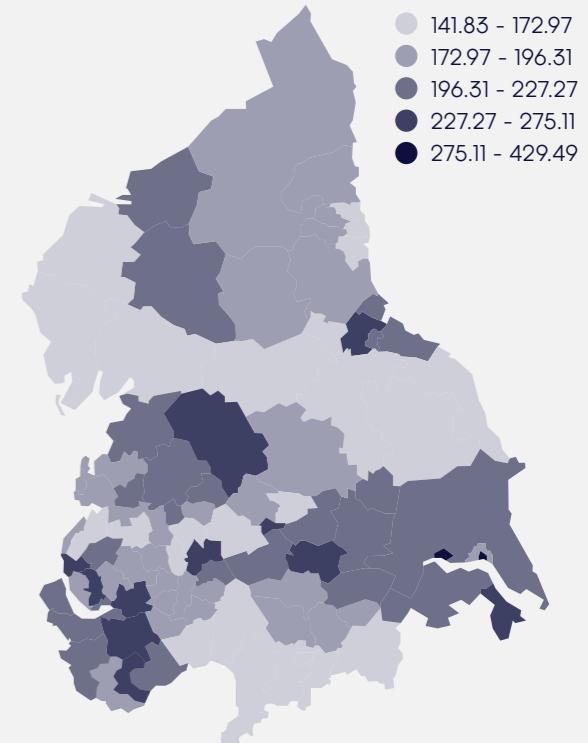
Urban areas typically showed lower CO₂ intensity and emissions per head of population than rural areas. However, there was some variation within area types, with coastal areas having slightly more fuel-efficient cars.

The next two sections show how emissions vary by travel type and traveller type in the North of England at a regional level. We have used disaggregate trip data from the National Travel Survey to carry out this illustrative analysis, as some of the parameters are not currently included within NoCarb.

CO₂ Emissions (tonnes) per head of population



Emissions Intensity (gCO₂/km)



Emissions by trip purpose and distance

The majority of car emissions in the North related to discretionary travel, with 67% generated by 'other' travel, 24% by commuting and the remaining 9% by business travel.

Through an increase in remote working and social distancing measures, the pandemic has demonstrated the potential for car emissions to be reduced across trip purposes. In the short-term, as we wait for a greater proportion of the vehicle fleet to be replaced by zero-emissions vehicles, reducing car travel will play a vital role in meeting decarbonisation targets.

Figure X: Percentage of car emissions in the North in 2017 by trip purpose



Figure X: Percentage of car trips by distance

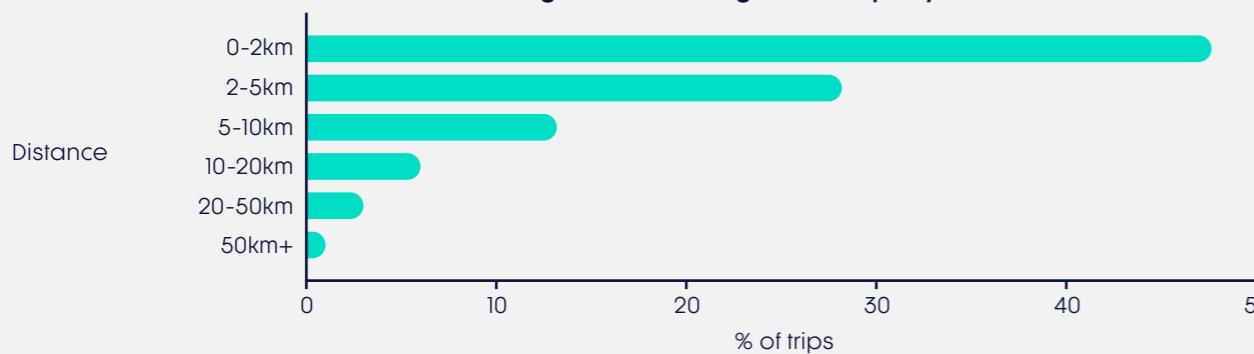
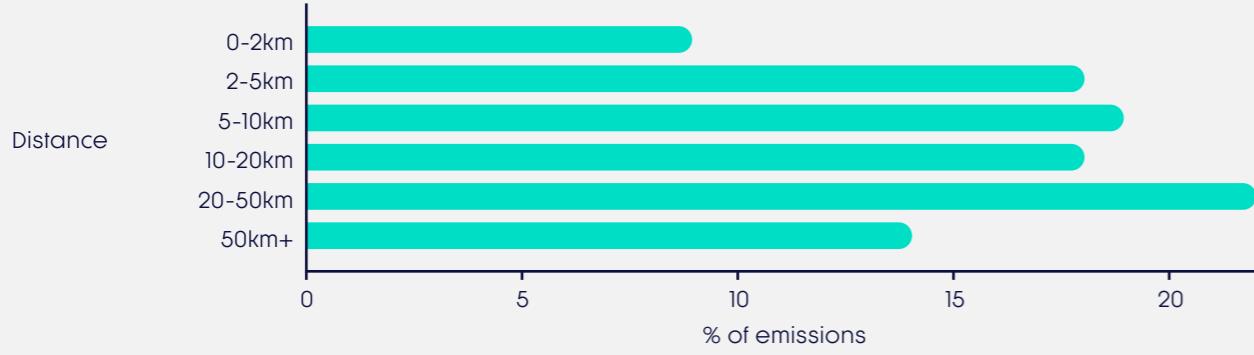


Figure X: Percentage of car emissions by distance



Distributional impacts

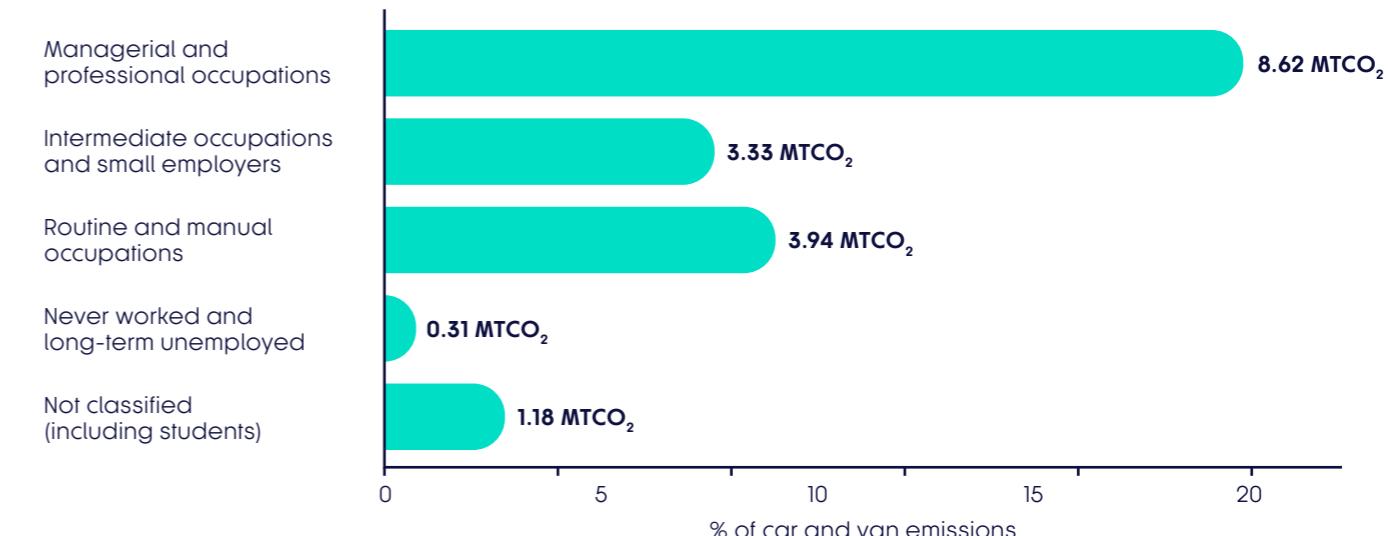
Distribution of emissions by employment group⁴

Different sections of the community produce varying rates of emissions. Our analysis⁵ suggests that around half of car and van emissions in the North are generated by individuals in managerial and professional occupations, as opposed to less than 2% by non-working individuals (Figure X). Individuals in managerial and professional occupations are also responsible for the majority of rail emissions, making up over 60% of the total distance travelled by rail.

With the lowest total emissions of all modes, bus travel sees a more balanced distribution across income groups. Just under 40% of bus emissions are produced by individuals working in routine and manual occupations, while those who are long-term unemployed and unclassified take up a notably larger share compared to cars, vans and rail.

These figures align with evidence that lower income groups are more likely to use buses than those on higher incomes, as the cost of bus travel is lower than trains and cars.⁶ This highlights that, to effectively reduce surface transport emissions, proportionately greater focus will be needed on transport decarbonisation measures that are likely to affect higher-income groups.

Figure X: Percentage of car and van emissions by employment group



⁴ These employment groups relate to the Office for National Statistics' [Socio-economic classifications \(NS-SEC\)](#).

⁵ This analysis was derived from the National Travel Survey 2017, filtered to only include trips that took place in the North. The share of emissions was assumed to be equivalent to the share of car, van and taxi kilometres travelled by each group. For the purpose of this analysis, it was not possible to isolate unique trips, so there may be some instances where trips were counted more than once (i.e. where people from the same household travelled together). Looking exclusively at trips undertaken by car/van drivers (or taxi passengers over 16 years old), the trends explained in this section are even more extreme. For example, the share of emissions increases from 50% to 54% for individuals in managerial and professional occupations and increases from 52% to 60% for men. The share of car and van emissions does not reflect the type and age of vehicles, meaning that newer, lower-emitting cars may slightly offset some of the emissions by higher-income groups.

⁶ Gates, Shivonne et al. [Transport and inequality: An evidence review for the Department for Transport](#). NatCen Social Research, 2019.

Distributional impacts

Distribution of emissions by gender

Responsible for 52% of car travel in the North, men produce slightly higher emissions than women (**Figure X**). This is equivalent to the gender split of drivers, with 48% of trips recorded as having a woman as the main driver. Trips taken by men also have slightly lower car occupancies, with an average of 1.93 people in a car or van compared to 2 for women.

Men represent just over half of rail emissions, making up 55% of rail travel in the North. The opposite is true for bus travel, with 55% of emissions produced by women.

Pag 10 Distribution of emissions by age

Over 50% of car and van emissions, and 60% of rail emissions, were produced by people aged 30-60 years old. Covering most of the working age population, this likely reflects more commuting, business and escort⁷ trips.

50-60 year-olds have the highest share of car and van emissions out of all age groups (19%), while 40-49 year-olds produce the highest share of rail emissions (23%).

Figure X: Percentage of emissions by gender

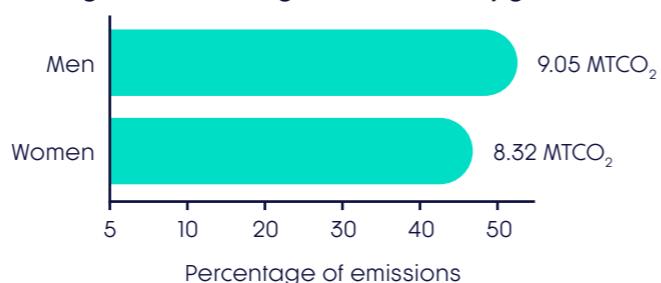
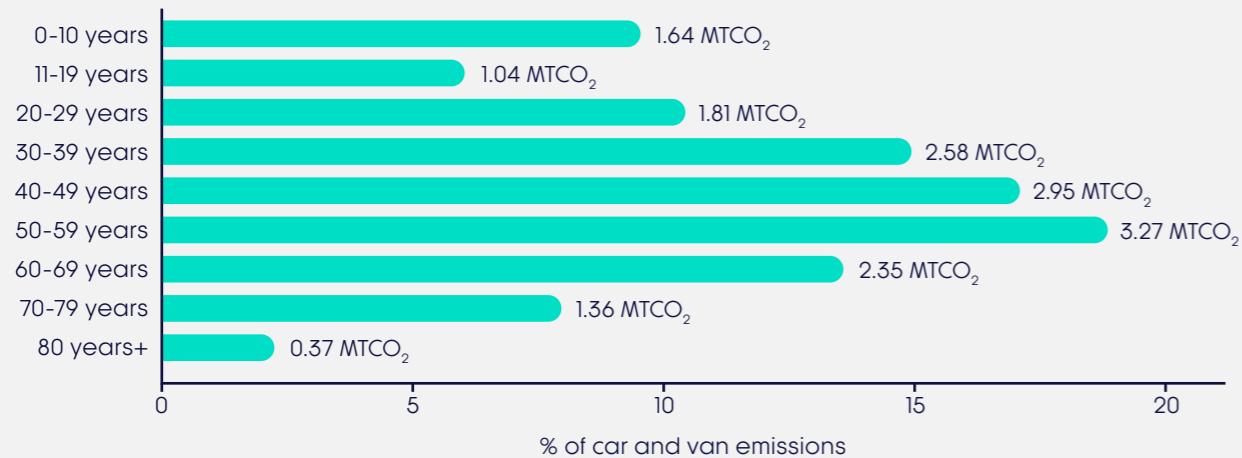


Figure X: Percentage of car and van emissions by age group



⁷ Such as driving children to school or other activities.

What this means for decarbonisation

While this section provides a high-level overview of how emissions can vary across groups, it is not an exhaustive list; nor does it capture the complex relationships between income, gender, age, disability, location (to name a few) and carbon consumption. For example, research suggests that low-income individuals in rural areas experience the worst effects of transport poverty, with high transport costs and low public transport access.⁸

Nevertheless, emissions intensity and emissions per head is often higher in rural areas compared to urban and sub-urban areas. This means that these individuals could be disproportionately disadvantaged by targeted decarbonisation measures, such as road-user charging.

Considering the impact of decarbonisation methods on different groups is critical to ensuring that the gap between disadvantaged and privileged groups is narrowed rather than widened. This is discussed further in Chapter 5.



Future emissions estimates

Scenario 1: Just About Managing

Under Just About Managing, economic growth continues at a moderate rate and is largely market-driven, consumption-led and unequal (both geographically and socially). While there is global climate change awareness, as people become more conscious of regular disasters, the policies introduced under this scenario are not radical enough to meet the UK carbon budgets and the net zero target of 2050.

The main consequence of this scenario is that highway networks become increasingly congested, and public transport levels remain similar to today. This is also reflected at the global scale, meaning that extreme weather events become more common in the UK, leading to frequent disruption to transport networks.

Mode	Demand growth 2018-2050	CO ₂ emissions in 2030 (mega-tonnes)	CO ₂ emissions in 2050 (mega-tonnes)
Rail	83%	0.6	0.4
Bus and shared mobility	-3%	0.3	0.0
Car	28%	10.8	0.0
Van	47%	1.7	0.0
HGV	6%	8.0	7.0
Active travel	4%	0.0	0.0

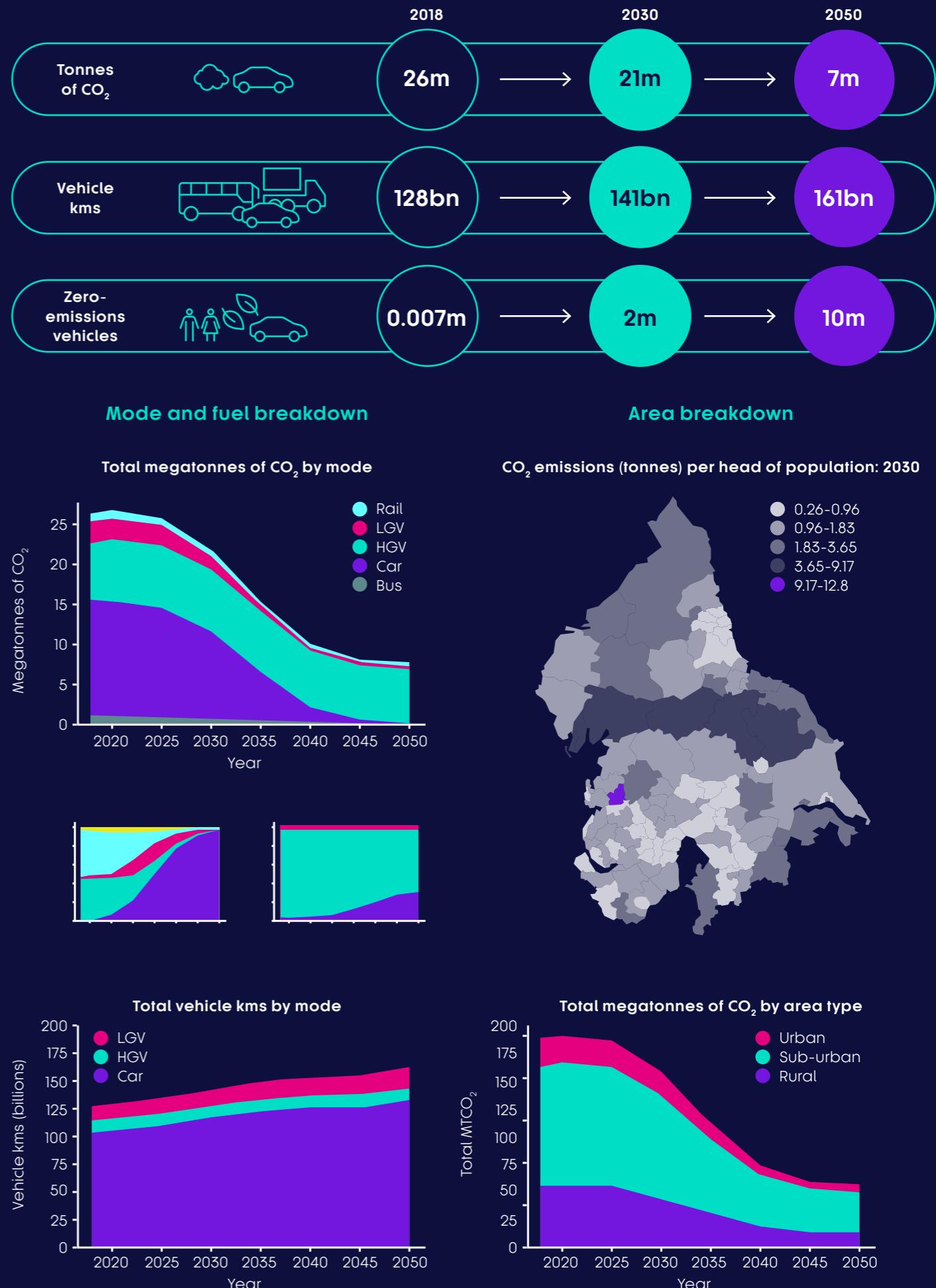
What if society continues to develop in line with existing trends?

- Existing trend of urbanisation and growth distribution continues. Little change in demographics and from travel behaviour seen today.
- Technology uptake driven by existing policy; Electric Vehicle (EV) uptake at slowest rate of all four scenarios and some autonomy. Continuation of shared transit and public transport use as seen pre-2020.
- No transformation in level of economic growth. Reactive political direction results in a rigid economy, lacking agility and vulnerable to economic shocks.
- Continued trends of active travel, with increases experienced during 2020, although any further step-change increase would require a continued and committed impetus.
- Net Zero 2050 target not met – climate change and travel disruption becomes more extreme.
- Moderate growth in remote working. Continuation of freight transportation as seen today.

Area type	Population in 2050 (millions)	Vehicle kilometres in 2050 (billions)	CO ₂ emissions in 2050 (mega-tonnes)
Urban	3.9	21.9	0.8
Sub-urban	9.8	90.0	4.8
Rural	2.3	49.0	1.5

Increases in car and van demand are largely offset by a growing share of zero-emissions vehicles. However, due to the higher costs associated with zero-emissions HGVs, most continue to be run on diesel. This makes up almost all residual emissions in 2050, which stand at just under 25% of 2018 levels.

Vehicle type	Fuel type	Share
Car	BEV	99%
Car	PHEV	1%
Van	BEV	98%
Van	PHEV	2%
HGV	BEV	27%
HGV	Diesel	73%



Future emissions estimates

Scenario 2: Prioritised Places

Prioritised Places sees a focus on work-life balance and social equity within and between places. This involves a shift in the UK's political and economic direction to ensure that no place is left behind. Every area, including cities, towns and rural and coastal areas, has a bespoke local economic strategy, supported by investment in local assets and economic and social infrastructure.

Mode	Demand growth 2018-2050	CO ₂ emissions in 2030 (mega-tonnes)	CO ₂ emissions in 2050 (mega-tonnes)
Rail	122%	0.6	0.4
Bus and shared mobility	19%	0.3	0.0
Car	28%	10.0	0.0
Van	47%	1.6	0.0
HGV	1%	7.6	6.7
Active travel	13%	0.0	0.0

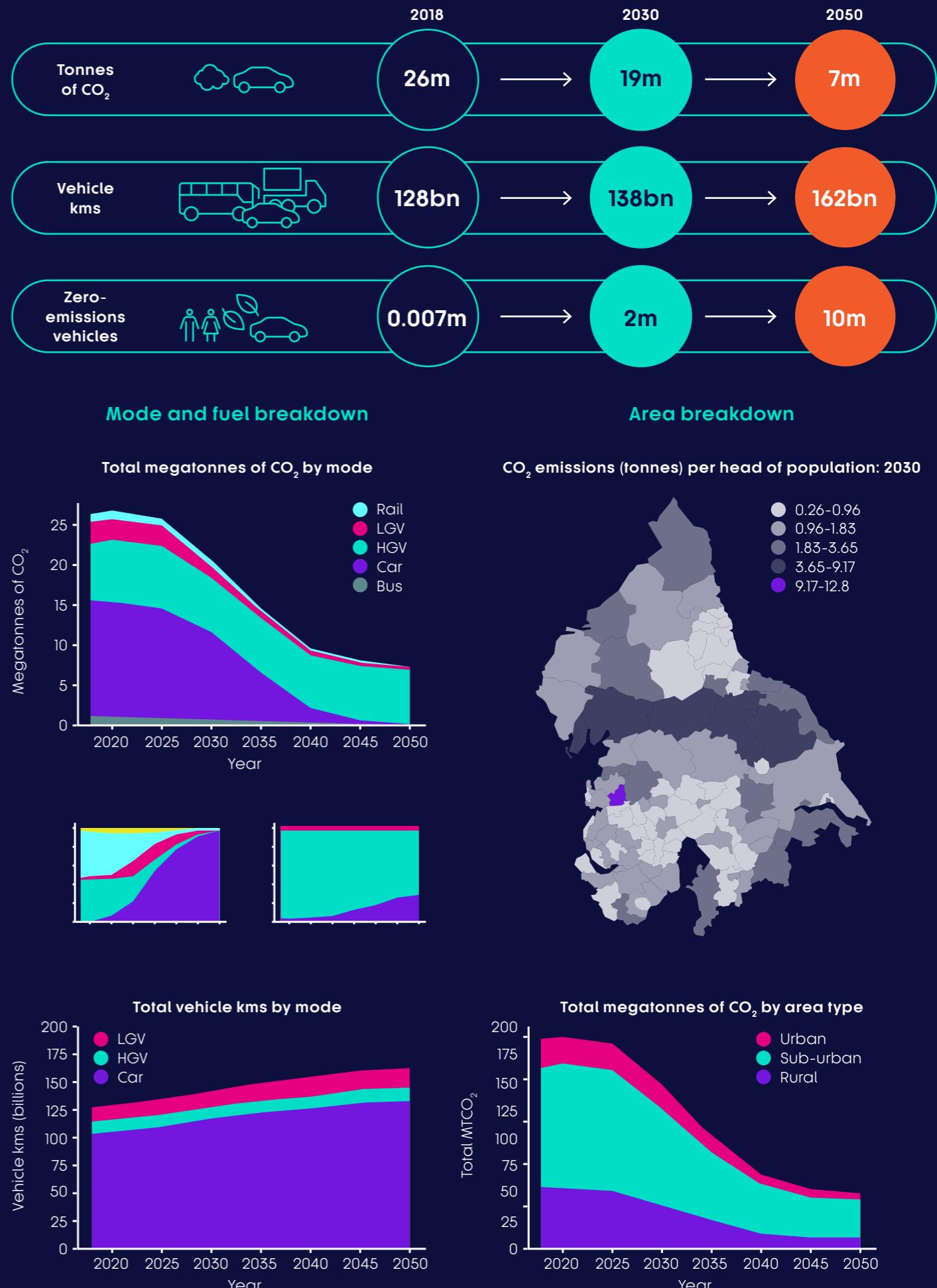
What if society becomes more focused on place, place-making and community than growth or connectivity?

- Bespoke local strategies, focusing on quality of life, place-making and community, rather than primarily economic growth. Slower growth in cities, more in towns and rural/coastal areas.
- Continued private mobility ownership sees a struggle to realise a zero-emission transport network.
- No transformation in level of economic growth, but society is more equitable and there is a fairer distribution of prosperity across the region.
- More active and public transport within communities. People value face-to-face interaction.
- Focus on work-life balance and social equity within and between places.
- Moderate growth in electric vehicles and some autonomy, especially in cities. Realisation of benefits for vulnerable groups, people with disabilities and extending Autonomous Vehicle (AV) networks to more isolated areas.

Area type	Population in 2050 (millions)	Vehicle kilometres in 2050 (billions)	CO ₂ emissions in 2050 (mega-tonnes)
Urban	3.8	20.7	0.7
Sub-urban	9.6	87.8	4.5
Rural	2.7	53.4	1.4

Similar to Just About Managing, increases in car and van demand are largely offset by a growing share of zero-emissions vehicles. Most HGVs also continue to run on diesel, though only a marginal increase in demand means that the emissions are slightly lower.

Vehicle type	Fuel type	Share
Car	BEV	99%
Car	PHEV	1%
Van	BEV	99%
Van	PHEV	1%
HGV	BEV	27%
HGV	Diesel	73%



Future emissions estimates

Scenario 3: Digitally Distributed

This scenario sees a future where digital and technological advances accelerate, transforming how we work, travel and live. In general, we embrace these technological changes and the move towards a distributed, service-based transport system, with the biggest drivers being technical

advances and a willingness to embrace mobility-as-a-service and shared mobility. Long-term climate change targets are met, but there is slow progress in the short-term due to a general preference for individualised mobility over traditional public transport.

Mode	Demand growth 2018-2050	CO ₂ emissions in 2030 (mega-tonnes)	CO ₂ emissions in 2050 (mega-tonnes)
Rail	78%	0.6	0.0
Bus and shared mobility	11%	0.3	0.0
Car	44%	9.6	0.0
Van	74%	1.6	0.0
HGV	4%	7.9	1.2
Active travel	6%	0.0	0.0

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What if society achieves Northern Powerhouse Independent Economic Review (NPIER) outcomes by using technological solutions to create connection and agglomeration across towns and cities?

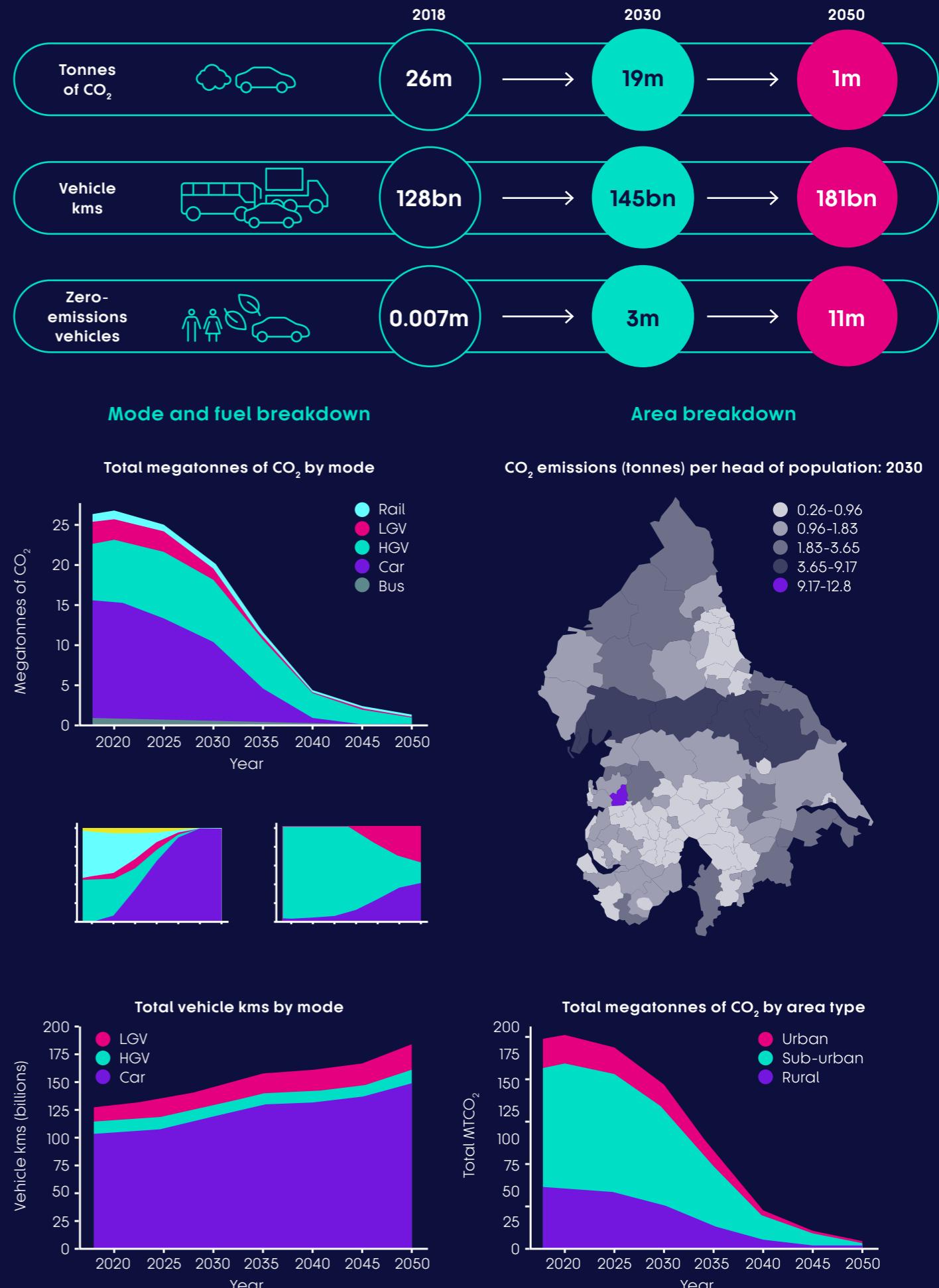
18

- Growth dispersed between cities and towns and less city-centric.
- High uptake of EV, Ultra Low Emissions Vehicles (ULEVs), Zero Emissions Vehicles (ZEVs) and driverless vehicles means zero emissions before 2050 (but slow progress in short-term). Some fiscal and regulatory action to influence technology use, but congestion persists in places due to availability of transport options. Increased digital remote working and dispersed employment means trip lengths are longer but less often.

Area type	Population in 2050 (millions)	Vehicle kilometres in 2050 (billions)	CO ₂ emissions in 2050 (mega-tonnes)
Urban	4.0	24.4	0.1
Sub-urban	10.6	101.4	0.8
Rural	2.6	54.9	0.3

With just under 1 MTCO₂ of residual emissions in 2050, this scenario sees the benefits of decarbonising HGVs earlier, with over 85% running on hydrogen or battery electric fuel cells.

Vehicle type	Fuel type	Share
Car	BEV	99%
Car	PHEV	1%
Van	BEV	99%
Van	PHEV	1%
HGV	BEV	27%
HGV	Diesel	73%
HGV	Hydrogen	47%



Future emissions estimates

Scenario 4: Urban Zero Carbon

This scenario sees a significant shift in public attitudes towards action on climate change, and a strong government response to meet it. Transport and energy planning and systems are adapted and integrated to deliver effective clean networks. All road transport is powered by electric

drivetrains ahead of 2050, with an increasing supply of low-carbon hydrogen available for some vehicles. This scenario is led by attitudes to climate action and urban placemaking, with the biggest drivers being strong government policy and urban densification.

Mode	Demand growth 2018-2050	CO ₂ emissions in 2030 (mega-tonnes)	CO ₂ emissions in 2050 (mega-tonnes)
Rail	193%	0.6	0.0
Bus and shared mobility	21%	0.3	0.0
Car	9%	7.1	0.0
Van	50%	1.2	0.0
HGV	-3%	7.6	1.1
Active travel	30%	0.0	0.0

Page 189

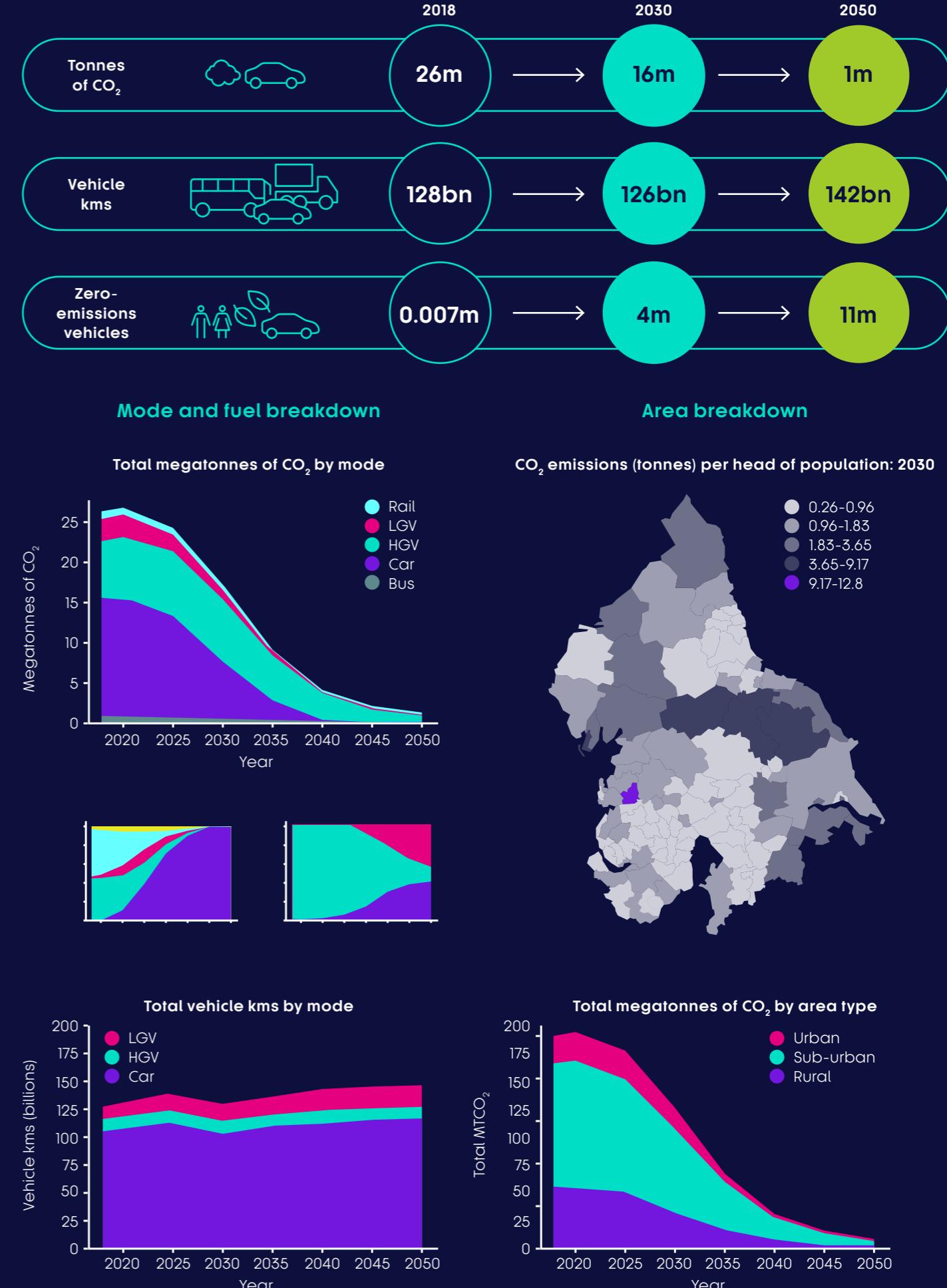
What if society achieves NPIER outcomes by using policy intervention to maximise energy-efficient city growth?

- Cities and large towns become more dense but attractive places to live. Large rural settlements may benefit, others will see reduction in population and employment without support of national policy.
- Transformational economic growth primarily through urban agglomeration and place-making.
- Strong fiscal and regulatory action set us on a pathway to zero carbon before 2050. Increased devolution leads to integrated transport and energy systems which deliver clean networks.
- Urban living reduces remote working and increases urban freight consolidation centres.
- Increased public and active transport, including shared mobility, as public and private travel becomes blurred.
- All new vehicles have a high level of autonomy, but are not fully autonomous by 2050. Shared AVs are well integrated into urban transport systems to complement public transport, but this doesn't extend to rural areas or small towns. Opportunities are not available to all, both geographically and due to attitudes and abilities with technology, sharing and data use.

Area type	Population in 2050 (millions)	Vehicle kilometres in 2050 (billions)	CO ₂ emissions in 2050 (mega-tonnes)
Urban	4.9	20.6	0.1
Sub-urban	10.0	78.8	0.8
Rural	2.3	42.4	0.2

This scenario sees increased demand across public transport and active modes, with a decrease in HGV demand. Consequently, it sees the lowest residual emissions (attributed to a small number of diesel HGVs) in 2050 at just over 1 MTCO₂.

Vehicle type	Fuel type	Share
Car	BEV	100%
Car	PHEV	0%
Van	BEV	100%
Van	PHEV	0%
HGV	BEV	38%
HGV	Diesel	14%
HGV	Hydrogen	47%

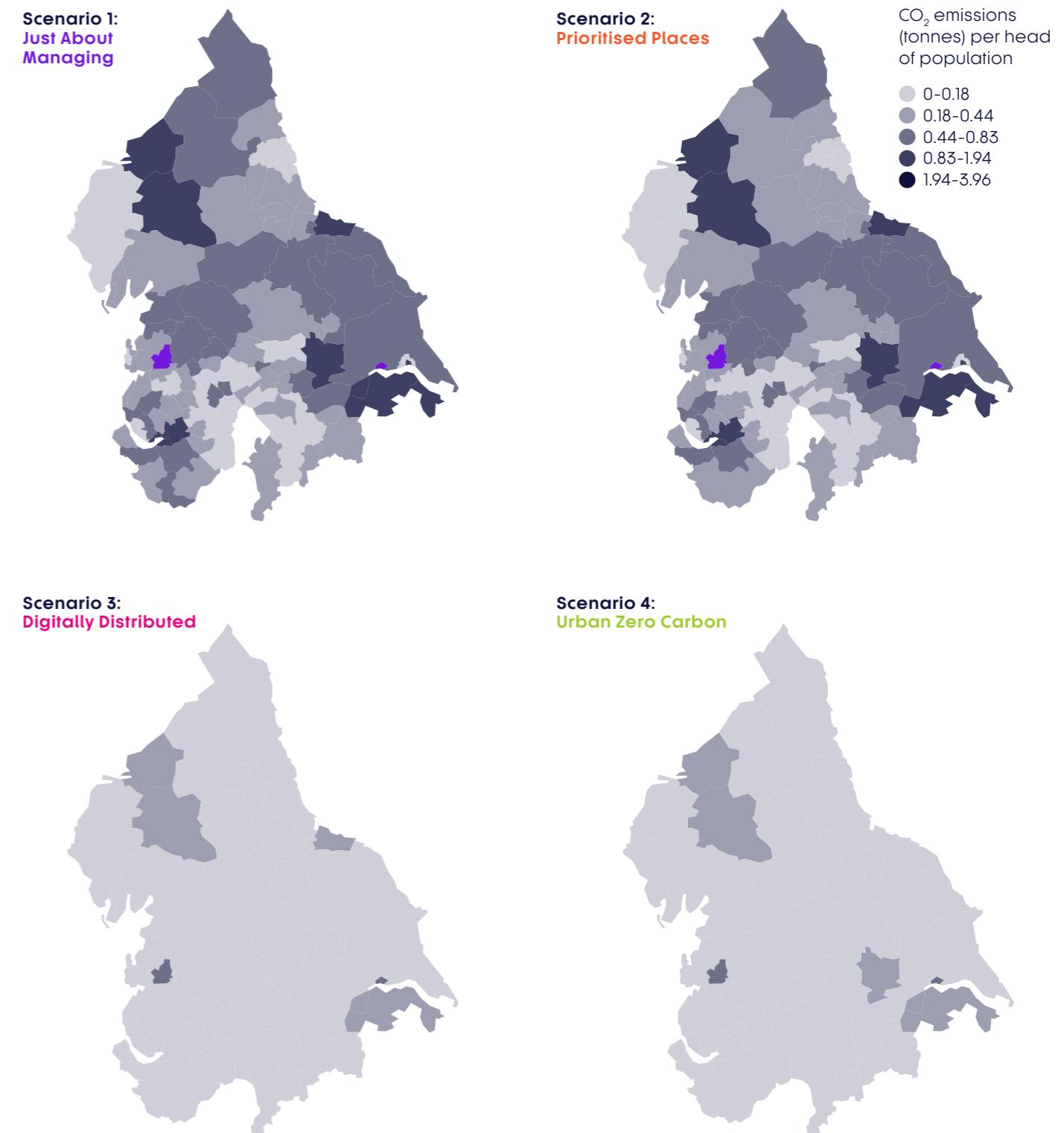


Placeholder: Explain how the distribution of emissions is different between scenarios – related to densification, economic growth etc. Include some of the scenario comparison from the Future Travel Scenarios report. Ximo iure ipsuntincias es minumqu iassequi ute vendisi commodit opta valoratumqui tem aliue quam volesse quis et laut unt apedit, ut ullamet hillabo. Olendic iissuntota valorer itius, audi qui a platiunt dolecab oreium doluptur? Toria doluntas vendis il ipsam conecerume valorro omnihic tempora estiis

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Future Travel Scenarios compared

Figure 7: CO₂ emissions per person (tonnes) in 2050 under each Future Travel Scenario, broken down by TfN's geographic zones.





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Agenda Item 8

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