Future Travel Scenarios

Summary

December 2020

TRANSPORT FOR THE NORTH

About Transport for the North

Contents

Transport for the North (TfN) is a Sub-national Transport Body (STB) with a statutory requirement to advise UK Government on the transport priorities for the North of England.

Our role is to add value through statutory advice to UK Government, ensuring value-for-money funding and strategic decisions regarding transport in the North are informed by our local knowledge, expertise and needs. Our advice reflects the views of our Members, bringing the region's political and business leaders together to consider transport solutions which connect the economic assets across the North, both internally to create an economic mass, but also externally as part of a global marketplace.

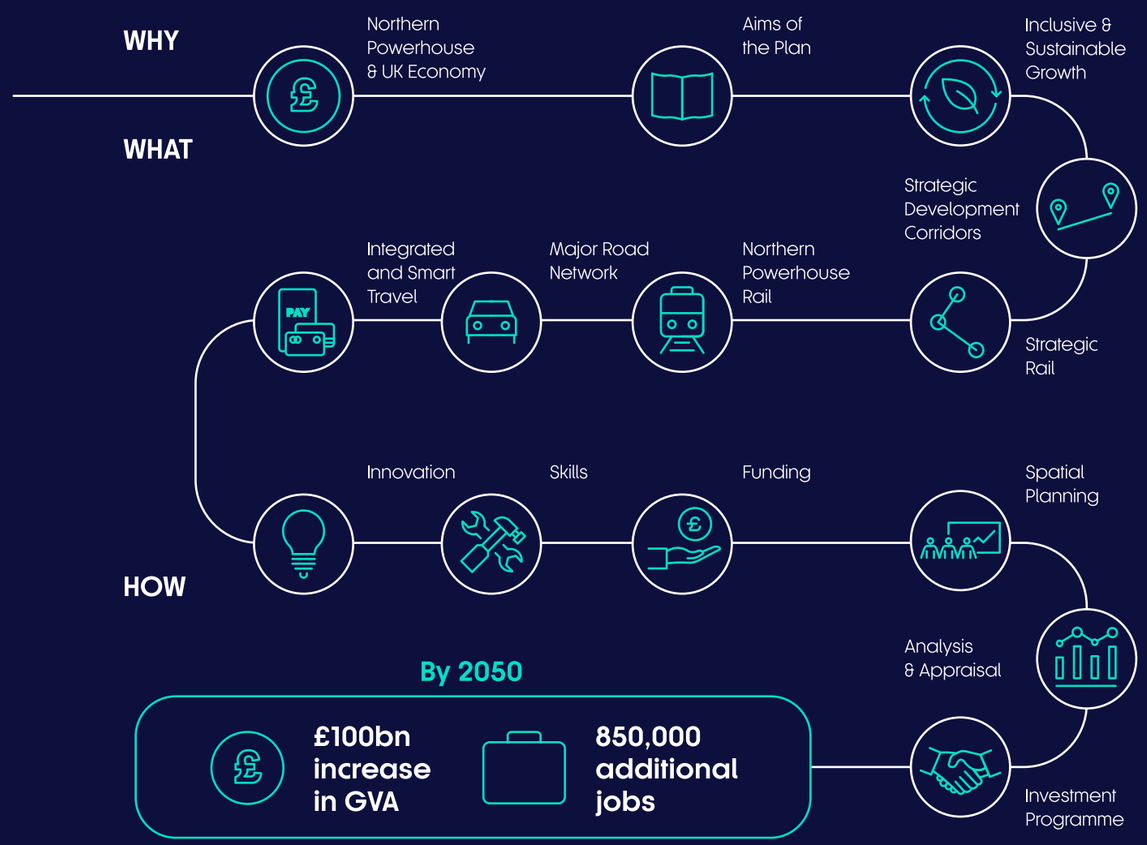
We published our Strategic Transport Plan (STP) and Investment Programme in February 2019. The STP set out TfN's vision of "a thriving North of England, where world class transport supports sustainable economic growth, excellent quality of life and improved opportunities for all". Supporting this vision are four pan-Northern transport objectives, which shape TfN's work programmes:

- ⇒ Transforming economic performance.
- ⇒ Increasing efficiency, reliability, integration, and resilience in the transport system.
- ⇒ Improving inclusivity, health, and access to opportunities for all.
- ⇒ Promoting and enhancing the built, historic, and natural environment.

Strategic Transport Plan

TfN's STP is underpinned by the Northern Powerhouse Independent Economic Review (NPIER). This provides a detailed understanding of the prosperity and productivity gap that exists between the North of England and the rest of the UK, and a high-level assessment of the potential contribution of improved transport connectivity to narrowing that gap. A key output of the NPIER was a 'transformational' future scenario in which the North experiences higher levels of population, employment and productivity growth relative to 'business as usual', as part of the UK Government's "levelling up" agenda.

Figure 1: A summary of Transport for the North's Strategic Transport Plan



What are Future Travel Scenarios?

Scenario planning is used to explore uncertainty about the future, providing enhanced information and testing to improve the resilience of long-term plans. TfN has adopted this approach to help future-proof decision-making on the investment needed to deliver the vision set out in the STP. TfN's new Future Travel Scenarios represent factors that are external to our direct control and are used as 'reference case' scenarios to test the performance of different strategies and policies against objectives.

Our Future Travel Scenarios represent a shared understanding across TfN and Northern Local Transport Authorities (LTAs) of plausible future states for society and travel demand in the North of England through to 2050. The Future Travel Scenarios are intended to stimulate collaboration, discussion and challenge towards building a consensus on factors of future uncertainty and their effects. Our intention is to deepen the understanding of the dynamics of change to inform and support evaluation of future transport strategy across the North.

Each scenario considers how travel may be influenced by a range of factors typically external to TfN's transport strategies, summarised as:

- Growth in the population and economy
- Spatial planning policy and economic distribution
- Technological advancement and uptake
- Social and behavioural change
- National policy on environment and sustainability

Who is this report for?

We have published this summary document to introduce our Future Travel Scenarios and provide key information on their development, what they represent, and their intended uses. The full Future Travel Scenarios Report is available at transportforthenorth.com to provide a comprehensive and transparent overview of stakeholder input and development processes, wider detail on the scenarios themselves, and illustrations of how we will apply the scenarios in practice.

Our scenarios are intended to foster collaborative thinking about the future of transport, allowing stakeholders to embrace uncertainty and help TfN refine the scenarios over time.

Developing Future Travel Scenarios

TfN has been working with LTAs, national delivery partners, and an advisory panel of industry and academic experts, to develop our Future Travel Scenarios. These stakeholders have been involved throughout and have provided valuable expertise, intelligence and challenge, particularly regarding local strategies and priorities.

Our aim was to deliver a credible and lasting framework through stimulating discussion, challenge and building a consensus. These scenarios are a product of this collaboration and sharing of diverse views, providing a collective understanding of potential future trends and informing delivery of transport policy at a local, regional and national level.

Future Travel Scenarios Advisory Panel

TfN worked with expert independent advisors to support the in-house development of our new Future Travel Scenarios. This included scenario planning expertise to guide development and an advisory panel which provided evidence, challenge and critique to TfN and partners across the key themes explored. This evidence is captured throughout this report, and also in our five 'Theme Technical Notes' which set out the important trends and drivers of change in each area. TfN has published these technical notes alongside this report.

Our advisory panel consisted of:

- **Jon Peters, Head of Infrastructure, Steer** - Scenario planning expert
- **Professor Glenn Lyons, Mott MacDonald, Professor of Future Mobility at University of West of England, Bristol** - Scenario planning expert
- **Professor Greg Marsden PhD Meng, FCIHT, FHEA** - Theme advisor 1 - Local and national transport sustainability
- **Charlene Rohr, Senior Research Leader, RAND Europe** - Theme advisor 2 – Social and behavioural change
- **Keith Mitchell, Regional Director (UK): Infrastructure, Stantec UK** - Theme advisor 3 – Spatial planning policy
- **Richard Holt, Head of Global Cities Research, Oxford Economics** - Theme advisor 4 – Economic outcomes
- **Giles Perkins, Head of Future Mobility, WSP** - Theme advisor 5 - Technological change and advancement

Why has TfN developed Future Travel Scenarios?

The world continues to change and with new signals and insights comes a need to review and interpret future uncertainty. Since our first future scenarios were published in 2017, TfN has developed and published the STP, built our Analytical Framework, and undertaken more detailed policy and scheme development, particularly for Northern Powerhouse Rail and our Investment Programme. To fully capture aspects in these developments, and keep pace with an ever-changing landscape, we have revisited our assessment of future uncertainty to ensure our policy-making and statutory advice is based on the latest evidence and accounts for a more sophisticated range of future uncertainties that are key to to realising our vision of a thriving North of England.

Our STP highlighted a wide range of factors that might affect how we travel (or not travel) in the future, and this Future Travel Scenarios summary and the separate full report build on our initial work on travel scenarios by applying a broader consideration of the economic, environmental and social uncertainties which will affect people's travel decisions, combining TfN's powerful analytical tools with expert user insight in a sophisticated and in-depth analytical programme. Together, TfN and our partners have collaboratively explored, challenged and stretched our considerations to build a comprehensive understanding of future uncertainty; its impact on the future travel patterns of people, business and goods; and the actions we might take to accommodate this in pursuit of our vision.

The purpose and approach of these refreshed 2020 travel scenarios is also different from our previous 2017 travel scenarios, which were designed to illustrate the potential scale of travel demand in a future transformed North of England, including the impact of the infrastructure investments set out in the STP. These new scenarios are designed to understand future trends without further investment, placing a greater focus on external change drivers - those things outside TfN's direct influence to help manage uncertainty in the planning of our Investment Programme. Our refreshed 2020 scenarios are therefore not directly comparable with the 2017 scenarios, but share the same core foundations of the NPIER and STP.

Our Future Travel Scenarios

Just About Managing

This scenario sees a state of inertia, although this should not be taken as neutral. It sees a future where people do not alter their behaviours much from today, or give up certain luxuries, although there is a gradual continued trend towards virtual interaction. Economic growth continues at a moderate rate, but it is largely consumption-led and unequal, lacking agility and vulnerable to shocks. This scenario is led by markets, without much increase in political direction, with its biggest driver being economic.

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. 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. This scenario is led by technology, with the biggest drivers being technical advances and a willingness to embrace mobility-as-a-service and shared mobility in the long-term.

Prioritised Places

This scenario sees a significant shift in 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, specialisms and economic and social infrastructure. Community, localism and place-making across the North is applied to build a sense of local identity to improve local economies. There is a focus on work-life balance and social equity within and between places. This scenario is led by a change in priorities, with its biggest driver being the push for a fairer redistribution of economic prosperity.

Urban Zero Carbon

This scenario sees a significant shift in public attitudes towards action on climate change, and strong national Government response to meet it. There is a boost to economic productivity to levels consistent with the NPIER, primarily through a combination of urban agglomeration and place-making. Transport users demand and embrace publicly available transit and active travel options, as there is a blurring of the line between ‘public’ and ‘private’ with increasing shared mobility systems online. This scenario is led by attitudes to climate action and urban place-making, with the biggest drivers being strong Government policy and trends of urban densification.

What will the scenarios allow us to do and what are the benefits?

Communicating our approach to uncertainty: Our aim is to develop a robust and evidence-based means by which the impacts of potential transport and land-use policies, measures or actions in the North can be gauged within the context of various plausible futures. There are a broad range of influences and trends affecting current and future transport in the North of England. Scenarios are not predictions. They are not in themselves intended to represent 'good' or 'bad' future worlds, but they should help us challenge and stretch thinking to develop a more comprehensive understanding of future uncertainty, with the aim to develop resilient strategies that move us towards our shared vision for the region.

Our intention is to use the scenarios as a constructive mechanism to test and refine our transport strategies; provide a vehicle for discussion to influence and inform the future of transport debate; and design transport interventions that can deliver on a broad range of objectives in different futures.

Improving a shared understanding of policy interactions: Future transport will likely be shaped through a combination of changes which remain to some extent uncertain. These include global socio-cultural trends; future national, regional and local policies; changes to regulations; new technologies; new mobility solutions and changes in behaviours. Transport is also likely to increasingly require interaction and integration with energy generation and supply, digital connectivity, housing infrastructure and associated land-use planning.

The right combination of investment in infrastructure, future policy, regulation and support for beneficial changes in behaviour, and adoption of new technologies will be critical to realising our vision for the North of England as a whole. To inform our strategic planning, we have applied these factors within the scope of our Future Travel Scenarios, to test the interactions between these policies and our transport strategies and provide new evidence on the local and national policies that complement TfN's strategy, and that TfN and partners should support.

Our scenarios will support an evidence-based approach to strategy and policy development, helping policy makers navigate both the risks and opportunities these uncertainties pose to meeting our vision for sustainable economic growth, excellent quality of life, and improved opportunities for all.

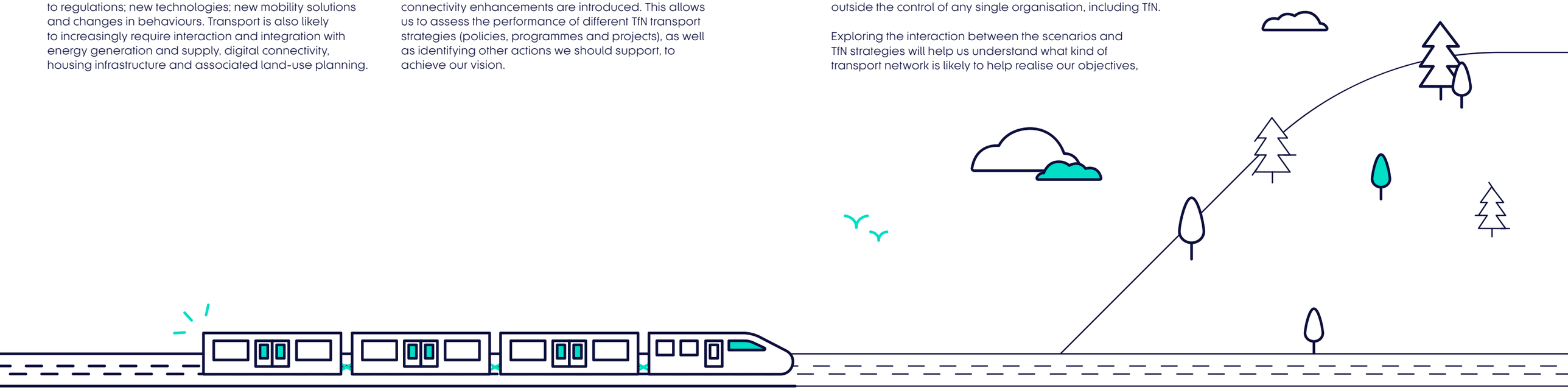
Applying to TfN programmes: Our Future Travel Scenarios will deliver a direct connection from future thought leadership and foresight to strategic planning and project delivery. They help us estimate travel demand associated with particular future states, which we can then apply within TfN's Analytical Framework. To allow this, our Future Travel Scenarios represent plausible futures for travel demand in the North - before any TfN transport interventions and connectivity enhancements are introduced. This allows us to assess the performance of different TfN transport strategies (policies, programmes and projects), as well as identifying other actions we should support, to achieve our vision.

Through doing this we can better understand the adaptability and resilience of our strategy and Investment Programme, and use that insight to support policy decisions, business case development, and the choice of transport investment. By assessing which interventions perform best in a range of scenarios, we can develop transport policies and strategies that are robust, resilient, flexible and innovative.

Refining our collective vision for the North: The TfN Board approved a draft Northern Transport Charter (NTC) which sets a future direction for TfN and our ambitions. One of these ambitions, 'championing inclusive and sustainable growth', includes further developing TfN's appraisal system to target investments that balance transformational economic growth with environmental and social outcomes. The Future Travel Scenarios will help us explore how different external factors will affect our ability to realise those outcomes and will also help us to refine our strategic objectives in line with these outcomes.

TfN and LTA engagement with individuals, transport users and communities will be fundamental in informing our Investment Programme and implementing any integrated future policies or strategies. The future of the North's transport network will be shaped by a range of factors outside the control of any single organisation, including TfN.

Exploring the interaction between the scenarios and TfN strategies will help us understand what kind of transport network is likely to help realise our objectives, aiding development of both TfN's Investment Programme and wider policy positions used to influence local and national policy in a direction that supports our vision. As such, the work on our Future Travel Scenarios provides additional evidence and is an important building block in providing robust statutory advice and updates to our STP.



Current baseline for the North of England

Growth in the population and economy

2018 level

Population in 2018: **15 million** with **6.6 million** in jobs. GVA: **318 billion**

Spatial planning policy and economic distribution:

Population growth

Urban: **24%**

Suburban: **61%**

Rural: **15%**

Social and behavioural change

Technological advancement and uptake

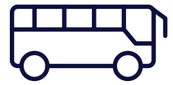
Share of fleet:
Zero emission vehicles: **0.5%**
Autonomous vehicles: **0%**

Remote working average **<0.5 days per week.**

National environment and sustainability policy:

Mode share

Rail: **2%**



Bus and shared mobility: **10%**

Transport carbon emissions: **26 million tonnes**

Car: **58%**

Active travel: **30%**

Total vehicles kilometres: **126 billion**

Covid-19: Adapting the Scenarios Framework to account for the global pandemic of 2020

While these scenarios are focused on the longer-term, we cannot lose sight of the fact that current global challenges to tackle Covid-19 are creating significant additional uncertainty by changing the way we move and, more fundamentally, what we deem as important. Some changes will remain, some will return to what we knew, and other new trends will likely emerge as society reacts over time.

This makes it even more important to build tools that allow for more effective assessment of what these trend changes may mean. We have reviewed our scenario narratives and outcomes in light of the global pandemic which began in early 2020, making adjustments as a result of significant changes to baseline patterns of travel (such as increases in working from home or active travel stimulus) and economic activity.

Our scenario analysis tool provides the basis for further interrogation of new trends, based on evidence as it develops. The Scenarios Framework can be regularly reviewed and adjusted with a mixture of light-touch annual updates and less frequent, more fundamental refreshes over time, with the aim of supporting an ambition of 'building back better'.

Our full Future Travel Scenarios report outlines our approach to Covid-19 in more detail and is available at https://transportforthenorth.com/reports/

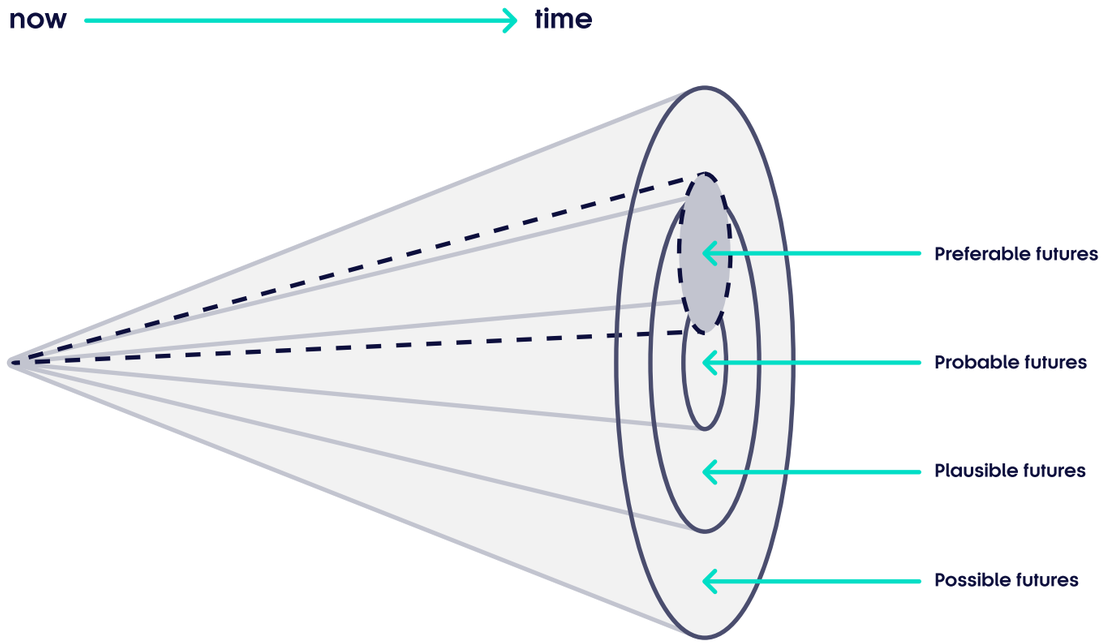
Data Source - TfN Analytical Framework. See Future Travel Scenario Technical Annex for more details here: https://transportforthenorth.com/economic-growth/future-transport-scenarios/

The guiding principles for our scenarios

i. Plausible and coherent: As we are uncertain about the future it would not be prudent to focus attention on a presumed 'probable' future; meanwhile entertaining 'possible' futures may seem too extreme. Focusing upon plausible futures allows uncertainty to be embraced in a balanced way. We have opted to develop scenarios that depict coherent plausible worlds, in which the drivers of change are interconnected by underlying trends, rather than worlds in which only a single factor differs from the perceived 'business as usual' scenario.

Our scenarios are intended to challenge the status quo, to "stress test" the development and evaluation of TfN strategies. The plausibility of our scenarios has been tested with both expert advisors and TfN partners and stakeholders.

Figure 2: The cone of future uncertainty



ii. Variation in outcomes: Scenarios should be sufficiently different from one another to represent a genuine spread of uncertainty. If scenarios are too similar, they will not provide a key function of stress-testing interventions against significantly different future contexts.

In exploring economic, social and environmental interdependences, our approach is aligned to the National Planning Policy Framework and ensures our strategies recognise and address interdependencies with non-transport sectors. There is an important balance to be achieved between improving the North's economic performance (which may entail regional increases in certain types of travel), ensuring that transport becomes increasingly sustainable in line with meeting carbon reduction targets, whilst supporting improvements in inclusivity and prosperity.

iii. Scenarios are 'before TfN intervention': Our scenarios should be seen as a tool to foresee problems and challenges which can then be addressed through policy action and intervention.

We have intentionally developed alternative worlds which go beyond the typical transport sector, to assess a broad range of drivers of change, which are outside TfN's direct influence. We will test our transport strategies against these reference scenarios to understand how they help achieve our Northern vision.

We do not comment on costs and feasibility of schemes identified within TfN's Investment Programme as part of this work.

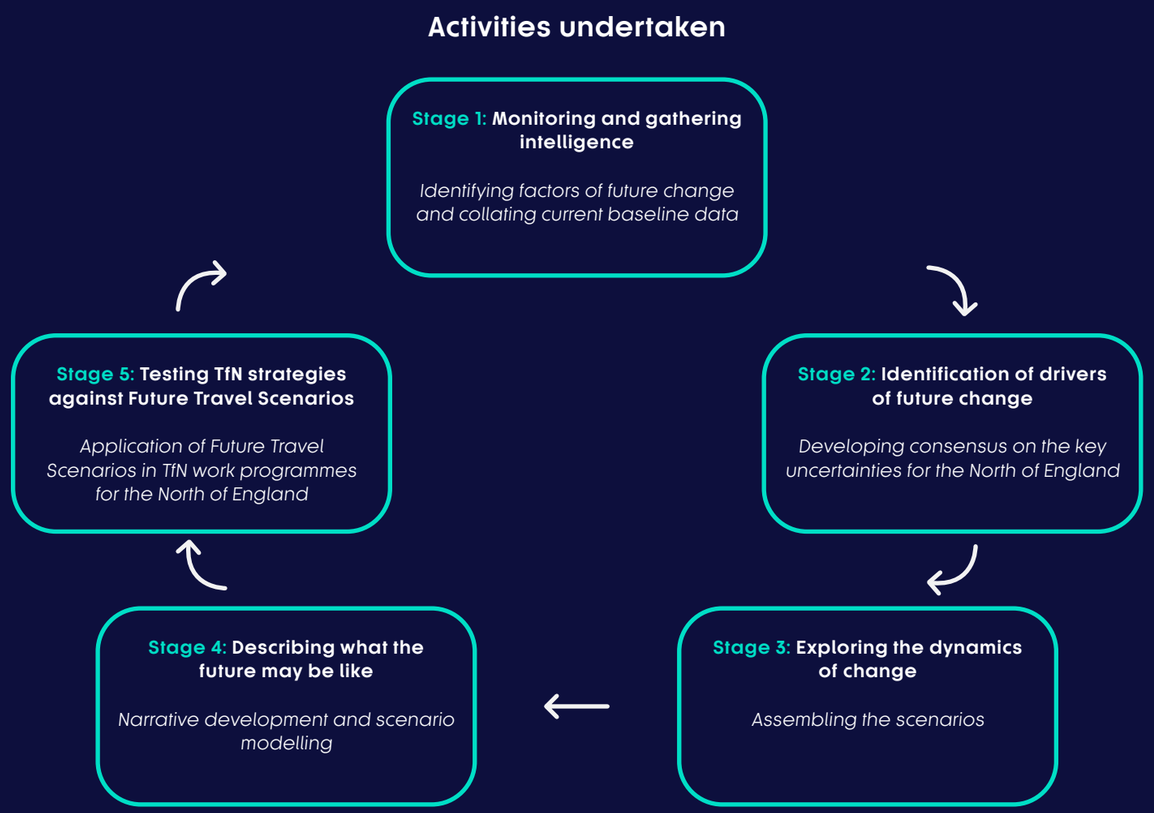
iv. Illustration of trade-offs: Realising a vision involves maximising a range of often competing objectives, e.g. maximising economic growth, maximising inclusivity and minimising carbon. Scenario analysis is one way of highlighting the trade-offs that external forces may drive between such competing objectives and allow the development of strategies that successfully balance these trade-offs.

How have we developed our scenarios?

Our methodology

Our approach is consistent with the Government Office for Science Futures and Foresight Toolkit. Development has followed the five-stage cyclical model outlined in Figure 3.

Figure 3: GO-Science stages as applied to TfN future scenario development



We are continuously refining our evidence base and have used latest evidence to establish a current baseline picture of travel demand across our five external key factors as an initial starting point for scenario development. Our Adivsory Panel provided evidence and challenge towards current thinking and perspectives to support the identification of potential drivers of future uncertainty. This formed the basis of our consideration and consensus-building among our stakeholders to develop of our Future Travel Scenarios narratives. We have then built these scenarios within TfN's Analytical and Assurance Frameworks, enabling a more tangible, quantified illustration of the different outcomes in each scenario.

Figure 4: TfN's Future Travel Scenario Framework Cycle

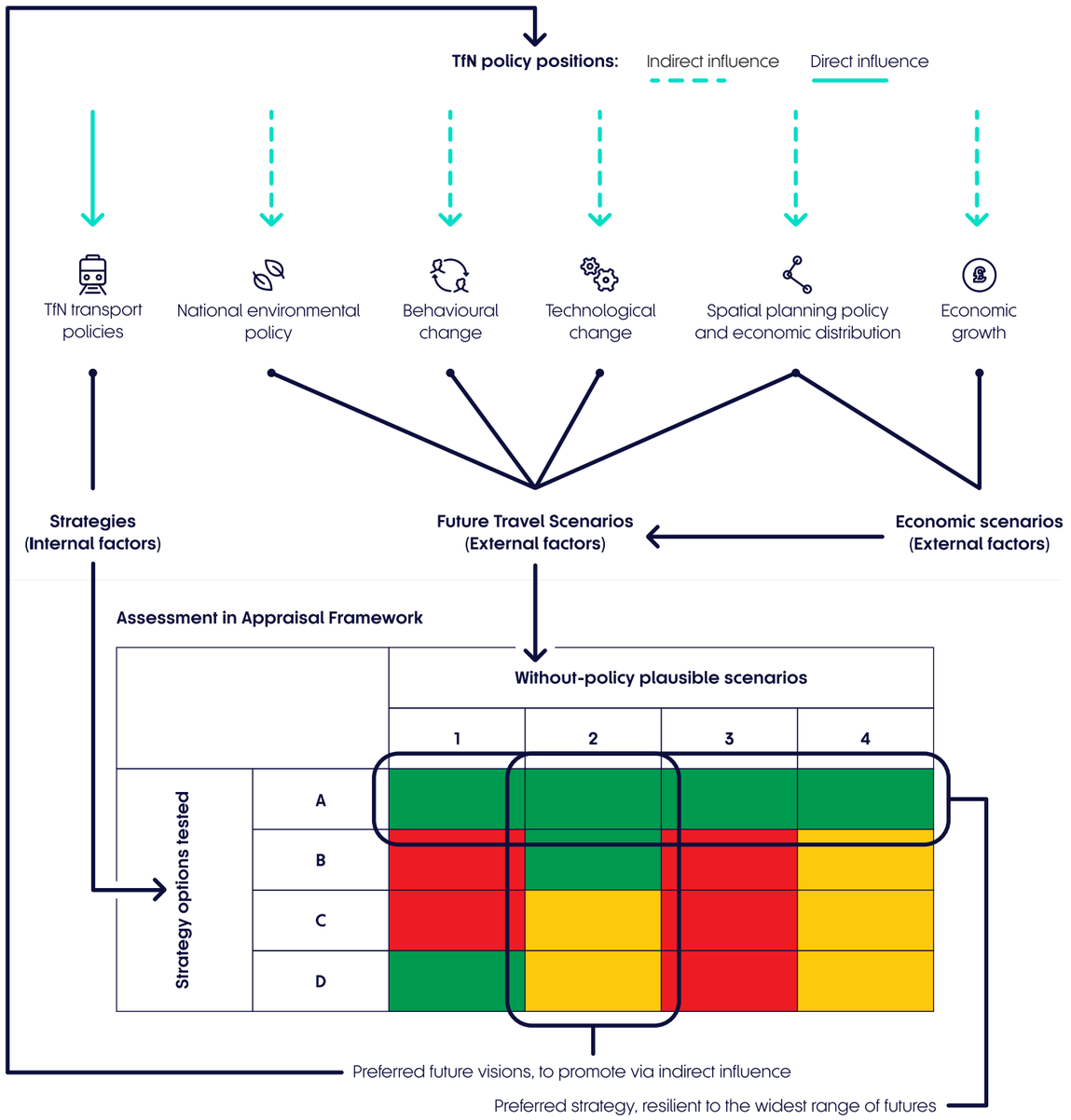


Figure 4 illustrates how our scenario analysis cycle can help us to identify which non-TfN policies have the most positive synergies with our transport strategies. Within the 'Assessment in Appraisal Framework' box, green represents a series of outcomes closely aligned to TfN's objectives, amber less so, and red indicates a misalignment with the objectives. In this example, 'Strategy A' represents the preferred intervention as it performs best in a range of scenarios. In addition, we can see that 'Scenario 2' also has the most positive outcomes and is therefore likely to include non-TfN policies that TfN should promote through its influence with national and local stakeholders.

How have we developed our scenarios?

Application of the Future Travel Scenarios is not a one-off exercise but is being integrated into TfN's wider evidence-building, planning and decision-making processes. By representing plausible futures for travel demand in a world without TfN intervention, we are able to assess the performance of different transport strategies (or policies, programmes and projects) within each scenario.

Our STP includes a series of 'policy positions' in which TfN seeks to work with partners and stakeholders across the North and beyond to deliver the North's vision and objectives (i.e. through national and local polices). Our scenarios recognise this by building a tool to identify how future uncertainties in some of those policies external to TfN might materialise; and what this might mean for our transport strategies.

Identifying key drivers of change and exploring dynamics of change to construct our scenarios

Applying intelligence provided by our Advisory Panel, TfN and partners identified the key drivers of change deemed as most important and uncertain. Importance was assessed on how important the driver would be in defining the future of transport demand in the North and certainty was assessed on how certain/uncertain the outcome for each driver would be.

To identify how the uncertainty associated with each driver could play out in the future, TfN and stakeholders explored the varying plausible future states for each driver of change. By considering the different directions in which these drivers of change could unfold, a series of plausible future states for each driver was developed, which in turn provided the building blocks for our Future Travel Scenarios.

Six of these drivers were chosen as key drivers of change which provided the key characteristics and framework of our scenarios. To enhance our scenarios, we applied morphological analysis to explore the effects of combining further drivers of change highlighted in Figure 5, increasing plausibility and improving the development of narrative. This maximised the range of uncertainty and captured the breadth of drivers of change identified by stakeholders.

Figure 5: Key drivers of change agreed by stakeholders (developed November 2019)

What could the future look like across the five external factors?

Each future scenario allows us to explore how different conditions might support or constrain delivery of transport strategies and measures, driven by a combination of global trends and national and local policy. The scenarios are depicted in narrative form, and this is accompanied by quantitative estimates of patterns of demographic change, economic activity and travel.

We undertook the intelligence gathering outlined in our Future Travel Scenario Report to open out and understand the detail and context behind our five key external themes. This has, in turn, driven our scenario development. To provide context to our scenario descriptions, it is helpful to summarise what our considerations mean for variation across our five overarching external factors.

1. **Economic growth** - The economic climate of the North of England.

Transformational economic growth – in line with the NPIER (850,000 jobs and £100bn GVA over and above the 'business as usual' forecast).

'Business as Usual' economic growth – Economic growth in line with business as usual economic forecasts.

2. **Spatial planning policy and economic distribution** - The level at which growth, housing and commercial developments are concentrated in existing urban areas, or are more evenly spread between cities, towns and rural areas.

Dispersed – A spatial framework and targeted strategy which encourages growth beyond the core cities and reduces inequality across the North (and wider UK generally). People disperse to sub-urban, rural and coastal areas due to larger proportion of agile and remote working practices; rapid changes in mobility provision; or find employment in these locations. Changes in industrial and logistics supply chains increase pressure to release sites on the edges of urban areas. Regeneration of town centres increases quality of place.

Spatially compact - Continued growth of larger conurbations due to agglomeration and increased external investment. Regeneration of communities within urban areas; some green belt release to accommodate growth. More people continue to flock to high density urban centres due to increased economic opportunity resulting in high-rise housing and better transport links within the city. Money is spent on regenerating communities within urban areas rather than encroachment on green belt land. Some rural places may be left behind.

3. **Technology advancement and uptake** - The pace of innovation for developing new or existing technology and the uptake of these measures by users.

Enthusiasm for new and innovative methods – Transport and mobility become fully electrified (battery, hydrogen and other sources), digitised and increasing autonomous. Users actively engage with digital solutions to manage travel, handing over their data for services. Data may become a requirement for transport use, forcing acceptance as people weigh up the benefits. Contactless takes over and we become a cash-less society. New modes become a reality and mobility is considered as a utility, informed decision-making, turn up and go, pay on account is the norm.

Tempered innovation and uptake – Users have little interest or limited means to choose alternative transportation methods. The user pushes back to digital and lacks trust in new technology. They are data resistant and protective over data use due to privacy breaches. Cash and analogue remain important. Physical human interactions are valued. Regulation and policy restrict development and most innovative transport modes fail to materialise or are commercially unsuccessful.

4. **Behavioural change** - The level of user interest in changing their behaviours in response to income, working patterns, location of jobs and housing, ownership models and attitudes to the environment.

Fundamental change to user attitudes and wants – Digital benefits are widely accepted socially as immersive home and hub working, networks, vehicles and customers are connected. User attitudes change and proactively shift to sharing assets and usership, as ownership models become obsolete. Subscriptions, demand for integrated public and private systems and on-demand services are more common. Climate change impacts lead to increasing environmental awareness and action, with more user emphasis on health.

Steady trend continuation and some resistance - Transport gradually evolves using the same broad modes without much change to ownership or payment models. Ownership and aspiration to own continue to rule with personal transport becoming even more important. Push back from all-encompassing digitised future due to security breaches. The trend of people becoming more protective over their data becomes more prevalent. Cash and analogue remain important as privacy and anonymity becomes a luxury. Human interactions are valued.

5. **National policy on environment and sustainability** - The level of operationalised policy, legislation and overall strategy to encourage transport decarbonisation and meet UK carbon budgets; and the private sector and social willingness for sustainable change.

'Hard and fast' – Social movement demands greater action. Climate emergency sees the UK Government take clear, robust and timely action to meet or better carbon budgets; leading the way to maintain its global leadership position in the race to carbon zero. Transport and mobility become fully electrified through various sources. Either complete transport payment reform where transport is paid for per use or per km, with externalities of transport usage accounted for in the price; or hard limits which stop or postpone some investments. Public opinion and policy also take full account of spatial factors such as environmental and biodiversity net gain (protection and enhancement).

'Soft and Slow' – Social appetite for change reaches its maximum; subsides due to other external factors; or UK policy action results in failure to meet carbon budgets as part of uneven progress globally. Liquid carbon-based fuels remain widespread for transport propulsion. Delayed policy direction; and continuation of incentive regimes and current central tax system, market frameworks or other subsidies (e.g. national vehicle taxation policy or local parking policy).

Just About Managing

This scenario sees a state of inertia, although this should not be taken as neutral. It sees a future where people do not alter their behaviours much from today, or give up certain luxuries, although there is a gradual continued trend towards virtual interaction. Economic growth continues at a moderate rate, but it is largely consumption-led and unequal, lacking agility and vulnerable to shocks. This scenario is led by markets, without much increase in political direction, with its biggest driver being economic.

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

- ⇒ Existing trend of urbanisation and growth distribution continues. Little change in demographics and 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.
- ⇒ Modest technology uptake; modest growth in electric vehicles 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.

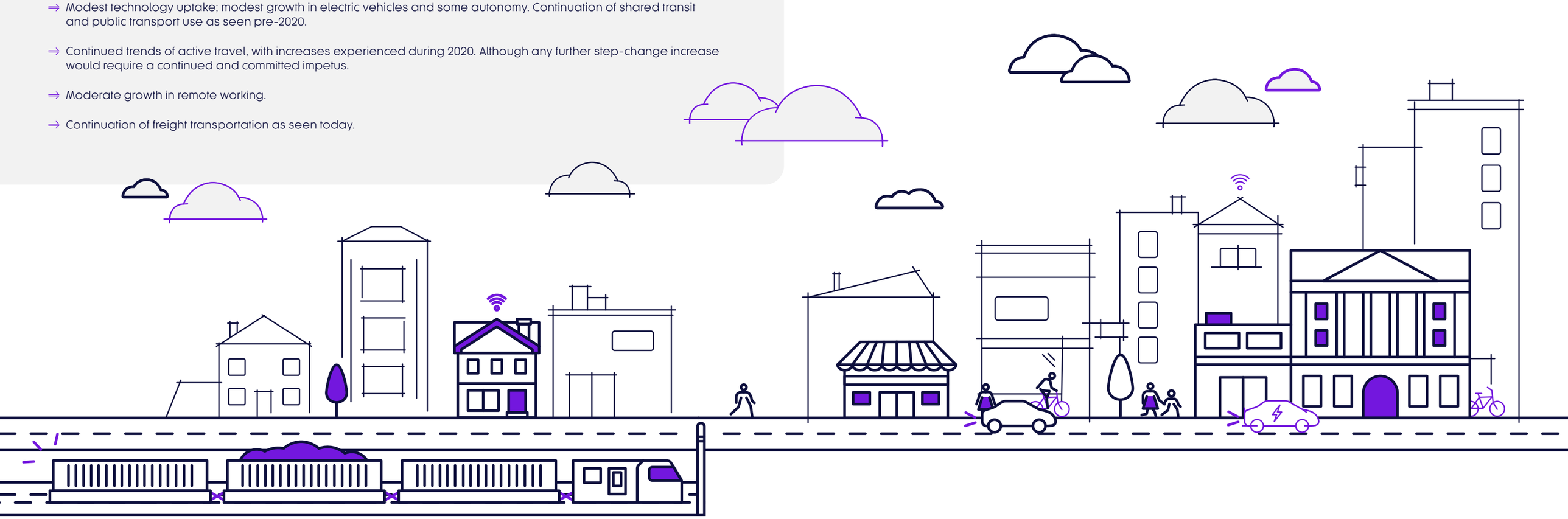
Economic growth

Inclusive prosperity / Social equity of spatial plans

Technology and uptake

Transport user behavioural change

Decarbonisation



Just About Managing

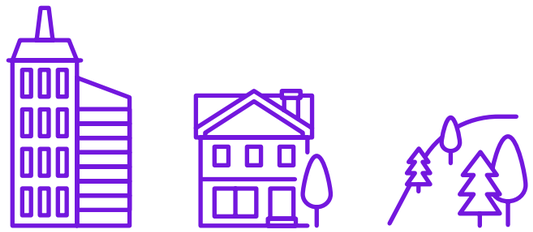
Growth in the population and economy

Growth to 2050, 2018 level illustrated by a dotted line

Population in 2050: **16 million** with **7.3 million** in jobs. GVA: **523 billion**

Spatial planning policy and economic distribution:

Population growth



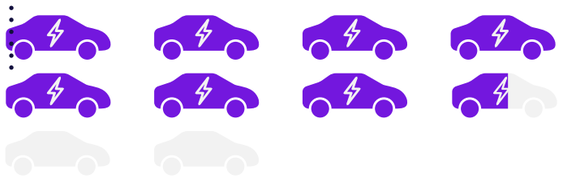
Urban: **6%**

Suburban: **7%**

Rural: **5%**

Social and behavioural change

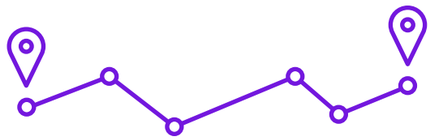
Technological advancement and uptake



Share of fleet:
Zero emission vehicles: **76%**
Autonomous vehicles: **25%**

Remote working average **2 days per week.**

Change in total trips by area type, 2018-2050



Urban: **9%**

Suburban: **6%**

Rural: **0%**

National environment and sustainability policy:

Demand growth (in number of trips made)

Rail: **83%**

Bus and shared mobility: **-3%**

Change in transport carbon emissions: **-71%**

Car: **6%**

Active travel: **4%**

Total vehicles kilometres growth: **28%**

Key potential implications of this scenario:

- ⇒ Climate change awareness throughout the population as people become more conscious due to regular climate change disasters. Government policies on climate change, however none are radical enough to meet carbon budgets.
- ⇒ Action will be required to manage potential for increased emissions produced by more people working from home.
- ⇒ Economic and inclusivity divides remain across the UK.
- ⇒ High levels of transport network congestion and pressure on road and rail networks.
- ⇒ The transport network does not adapt to provide efficiency, reliability, integration and resilience to its users.
- ⇒ The health agenda will spur policies on active travel but with only very gradual change similar to what we have seen in the last 20 years.
- ⇒ Freight mode share tends towards increase on the Major Road Network.
- ⇒ Paying for transport becomes more challenging due to a mixed fleet of electric and fossil-fuelled vehicles, resulting in some paying fuel duty and others not.
- ⇒ There are likely to be missed opportunities from failing to embrace new mobility technology.
- ⇒ Regional and social inequalities persist and risk of further disparity.

Data Source - TfN Analytical Framework. See Future Travel Scenario Technical Annex for more details here: https://transportforthenorth.com/economic-growth/future-transport-scenarios/

Prioritised Places

This scenario sees a significant shift in 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, specialisms and economic and social infrastructure. Community, localism and place-making across the North is applied to build a sense of local identity to improve local economies. There is a focus on work-life balance and social equity within and between places. This scenario is led by a change in priorities, with its biggest driver being the push for a fairer redistribution of economic prosperity.

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.

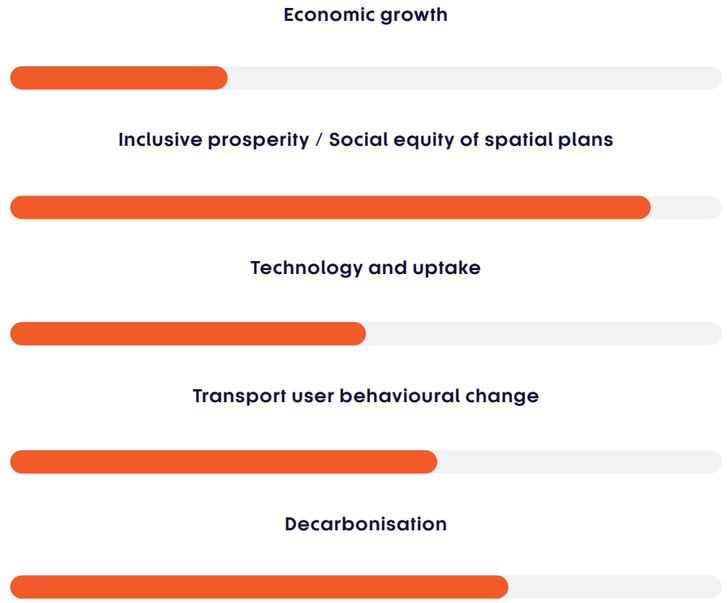
⇒ No transformation in level of economic growth, but society is more equitable and there is a fairer distribution of prosperity across the region.

⇒ Moderate growth in electric vehicles (and other Ultra-Low Emission Vehicles (ULEVs)) 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.



Prioritised Places

Growth in the population and economy

Growth to 2050, 2018 level illustrated by a dotted line

Population in 2050: **16 million** with **7.3 million** in jobs. GVA: **524 billion**

Spatial planning policy and economic distribution:

Population growth

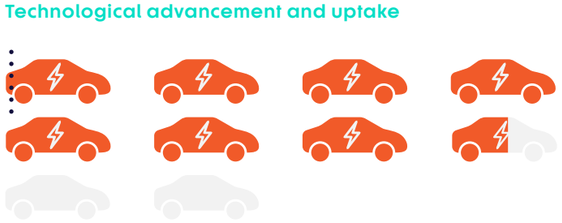
Urban: **3%**

Suburban: **5%**

Rural: **20%**

Social and behavioural change

Technological advancement and uptake



Share of fleet:
Zero emission vehicles: **76%**
Autonomous vehicles: **25%**

Remote working average **1 day per week.**

Change in total trips by area type, 2018-2050

Urban: **7%**

Suburban: **7%**

Rural: **15%**

National environment and sustainability policy:

Demand growth (in number of trips made)

Rail: **122%**

Bus and shared mobility: **19%**

Change in transport carbon emissions: **-73%**

Car: **1%**

Active travel: **13%**

Total vehicles kilometres growth: **27%**

Key potential implications of this scenario:

- ⇒ Progress on climate change targets compared to 'Just About Managing', but not significant enough due to lack of urgency in technological transformation.
- ⇒ New policies for integrated transport and land-use planning would need to be introduced early on with regular spatial planning.
- ⇒ Potential for growing car dependency in rural and remote areas. Increased localised car trips (as the main connectivity option in suburban and rural areas) may offset potential reductions in longer journeys.
- ⇒ Investment and measures likely needed on both road and rail networks to link towns to each other and to city areas.
- ⇒ Greater need for strong pan-Northern Major Road Network and local road networks to support a variety of modes.
- ⇒ Communities may be too isolated from one another.
- ⇒ Uncertainty over whether new focus on quality of life is fiscally sustainable – need to balance these new priorities with supporting businesses to create jobs and tax receipts.
- ⇒ Investment likely needed to start chain of specialisms and job creation, with early intervention key.
- ⇒ Connections to UK tourist and cultural spots, leisure facilities and Areas of Natural Beauty become important due to changes in work/life balance.
- ⇒ Freight mode share tends towards increase on the Major Road Network.

Data Source - TfN Analytical Framework. See Future Travel Scenario Technical Annex for more details here: https://transportforthenorth.com/economic-growth/future-transport-scenarios/

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. 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. This scenario is led by technology, with the biggest drivers being technical advances and a willingness to embrace mobility-as-a-service and shared mobility in the long-term.

What if society achieves NPIER outcomes by using technological solutions to create connection and agglomeration across towns and cities?

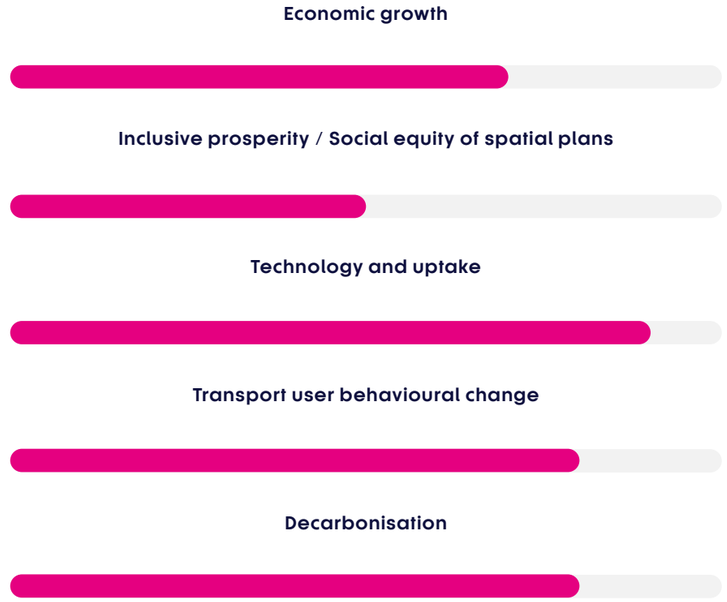
⇒ Growth dispersed between cities and towns and less city-centric.

⇒ High uptake of EV, 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.



Digitally Distributed

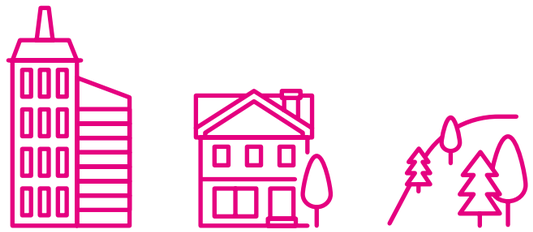
Growth in the population and economy

Growth to 2050, 2018 level illustrated by a dotted line

Population in 2050: **17 million** with **8.0 million** in jobs. GVA: **677 billion**

Spatial planning policy and economic distribution:

Population growth



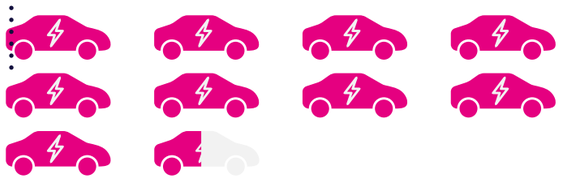
Urban: **10%**

Suburban: **16%**

Rural: **17%**

Social and behavioural change

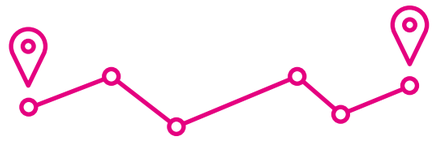
Technological advancement and uptake



Share of fleet:
Zero emission vehicles: **95%**
Autonomous vehicles: **75%**

Remote working average **3 days per week.**

Change in total trips by area type, 2018-2050



Urban: **7%**

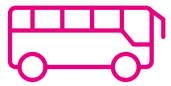
Suburban: **10%**

Rural: **6%**

National environment and sustainability policy:

Demand growth (in number of trips made)

Rail: **78%**



Bus and shared mobility: **11%**

Change in transport carbon emissions: **-96%**

Car: **8%**

Active travel: **6%**

Total vehicles kilometres growth: **44%**

Key potential implications of this scenario:

- ⇒ Whilst zero emissions targets are met by 2050, there is slow progress during early periods due to lack of urgency in demand management.
- ⇒ Actions are taken to manage increased emissions produced by more working from home. Smarter homes may move to a microgrid system for electricity storage and low carbon generation, moving away from a centralised energy system but still enabled by the National Grid.
- ⇒ Funding of travel must change due to fewer drivers paying Vehicle Excise Duty and Fuel Duty as cars become electric or other low/zero emission fuels.
- ⇒ Risk that transport network congestion persists due to good availability of new transport solutions which provide additional connectivity options for users, particularly in urban areas in the short to medium-term.
- ⇒ Increased localised car trips for non-commuting reasons (as the main connectivity option in suburban and rural areas) may offset potential reductions in longer commuting journeys due to increased digital and remote working.
- ⇒ Is digital connectivity an adequate replacement for face-to-face?
- ⇒ Adequate digital infrastructure will be required to support the population changes across area types and increased remote working.
- ⇒ Some people may be excluded if they are unable or unwilling to embrace technology.
- ⇒ Relatively more out-of-town employment, such as in the energy sector and manufacturing due to specialisation clusters.
- ⇒ Services may shift significantly to online, resulting in fewer shopping trips. However, this may be offset by the reduced time commuting and lower travel costs of Connected and Autonomous Vehicles (CAVs), providing will mean increased leisure time and trips (i.e. change of trip purpose rather than trip number).
- ⇒ Road network efficiency will need to be improved to ensure all AV vehicles are connected and the road network will still require space to park AV vehicles.
- ⇒ Does active travel and the importance of health decrease as reliance on technology and multiple connectivity options increase?
- ⇒ If people are further apart rather than centralised in key cities freight will have to travel further.
- ⇒ Fewer trips by rail may result in commercial impacts.

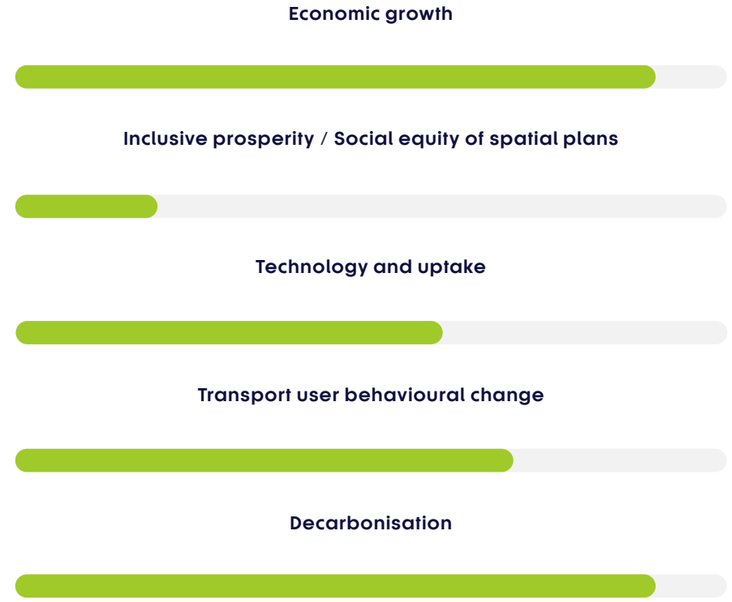
Data Source - TfN Analytical Framework. See Future Travel Scenario Technical Annex for more details here: https://transportforthenorth.com/economic-growth/future-transport-scenarios/

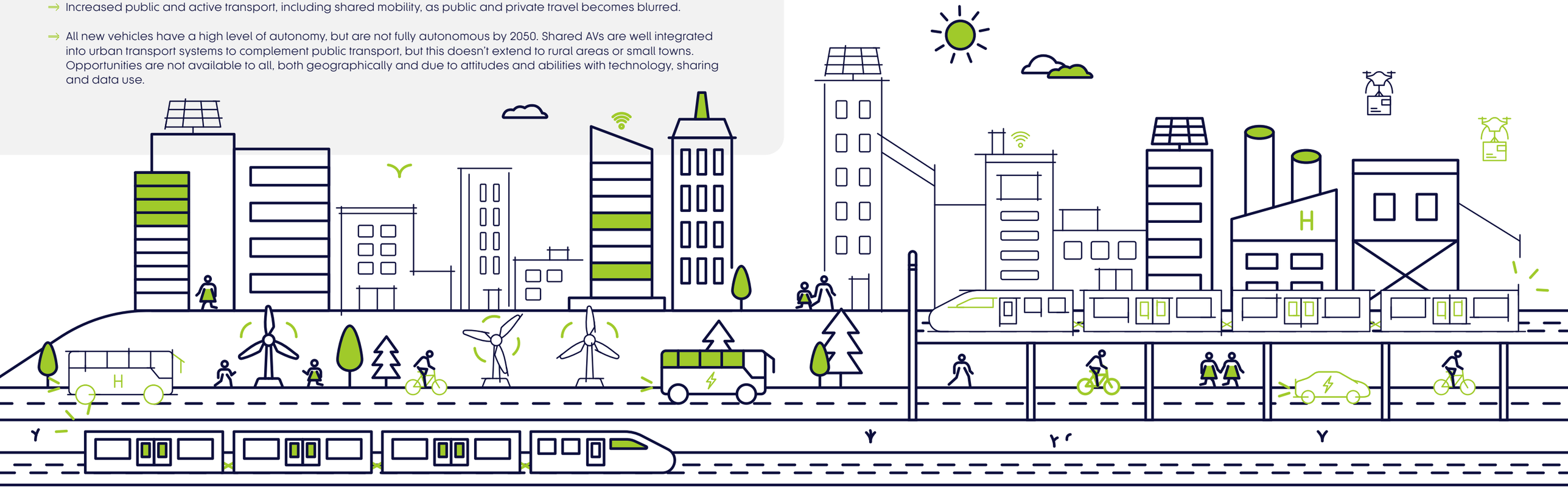
Urban Zero Carbon

This scenario sees a significant shift in public attitudes towards action on climate change, and strong national Government response to meet it. There is a boost to economic productivity to levels consistent with the NPIER, primarily through a combination of urban agglomeration and place-making. Transport users demand and embrace publicly available transit and active travel options, as there is a blurring of the line between 'public' and 'private' with increasing shared mobility systems online. This scenario is led by attitudes to climate action and urban place-making, with the biggest drivers being strong Government policy and trends of urban densification.

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.





Urban Zero Carbon

Growth in the population and economy

Growth to 2050, 2018 level illustrated by a dotted line

Population in 2050: **17 million** with **8.0 million** in jobs. GVA: **680 billion**

Spatial planning policy and economic distribution:

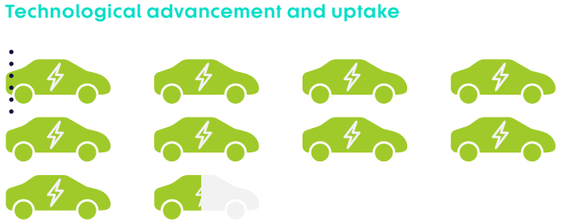
Population growth

Urban: **33%**

Suburban: **10%**

Rural: **5%**

Technological advancement and uptake

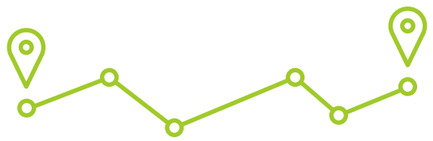


Share of fleet:
Zero emission vehicles: **95%**
Autonomous vehicles: **50%**

Remote working average **2 days per week.**

Social and behavioural change

Change in total trips by area type, 2018-2050



Urban: **34%**

Suburban: **5%**

Rural: **-7%**

National environment and sustainability policy:

Demand growth (in number of trips made)

Rail: **193%**

Bus and shared mobility: **21%**

Change in transport carbon emissions: **-96%**

Car: **-6%**

Active travel: **30%**

Total vehicles kilometres growth: **13%**

Key potential implications of this scenario:

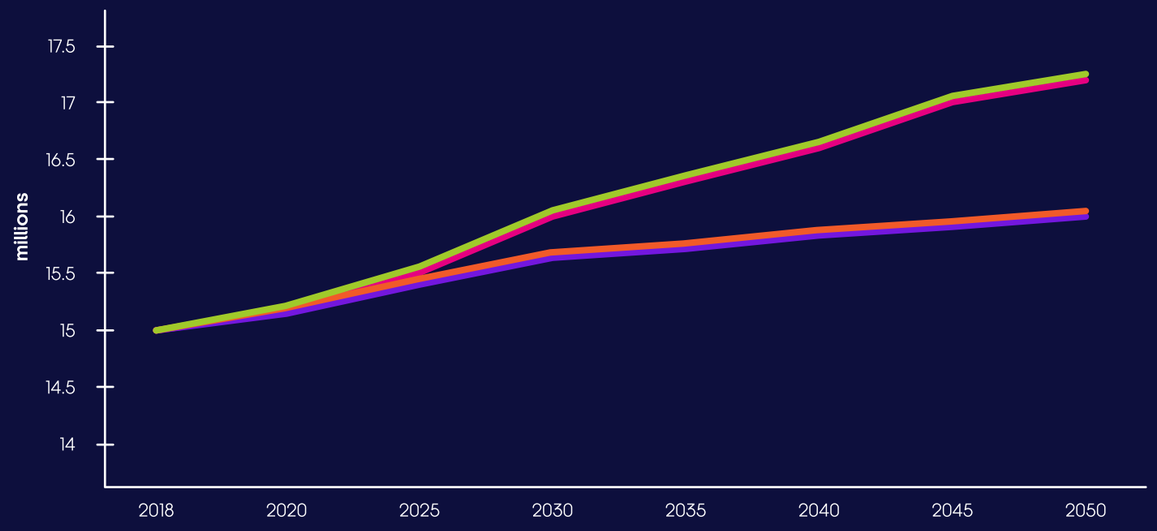
- ⇒ This scenario requires strong national and local policy to be in place for urban land to be made available to support sustainable densification.
- ⇒ Planning authorities will need to act (and have the power and support) to increase the liveability of cities in terms of services available, quality of life and sustainable transport modes, making cites highly attractive places to live.
- ⇒ More remote settlements need a sustainable economic model to avoid decline.
- ⇒ If most economic activity is concentrated within cities, there is a risk that important connections between cities are neglected and important business connections are not embraced.
- ⇒ The skills and opportunities gap grows between places across the region.
- ⇒ The rail network is required to support increased freight and passenger connectivity between cities, particularly as demand reduction policies are introduced early and extensively in the scenario. This contributes to the reduction in road traffic and uptake of public and shared transport overall.
- ⇒ Less new infrastructure is required on the Major Road Network and local roads, but maintenance remains vital to provide flexibility and efficiency for active modes and new mobility solutions.
- ⇒ This scenario depends on a clean resilient energy supply and strong integrated planning of energy, land use and transport to meet the net zero goal. A comprehensive charging network across the UK would be required, supported by the National Grid.
- ⇒ There will need to be increased action from businesses to supply the increasingly environmentally conscious consumer as the public strive for sustainability in their goods and services.

Data Source - TfN Analytical Framework. See Future Travel Scenario Technical Annex for more details here: https://transportforthenorth.com/economic-growth/future-transport-scenarios/

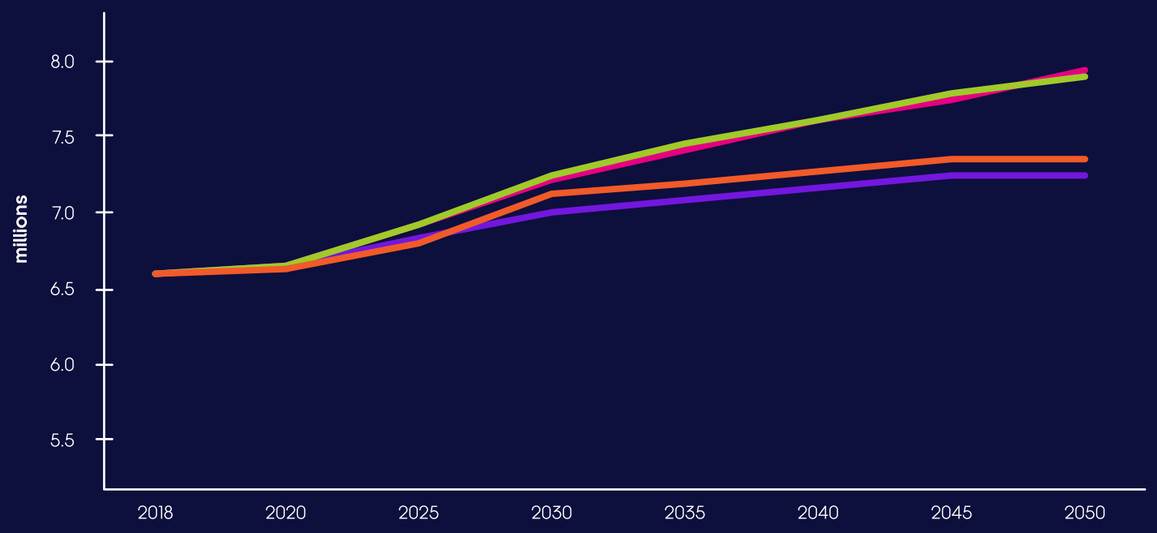
Scenario comparisons

Figure 6: Population & employment

Population in the North, 2018-2050, by scenario



Jobs filled in the North, 2018-2050, by scenario

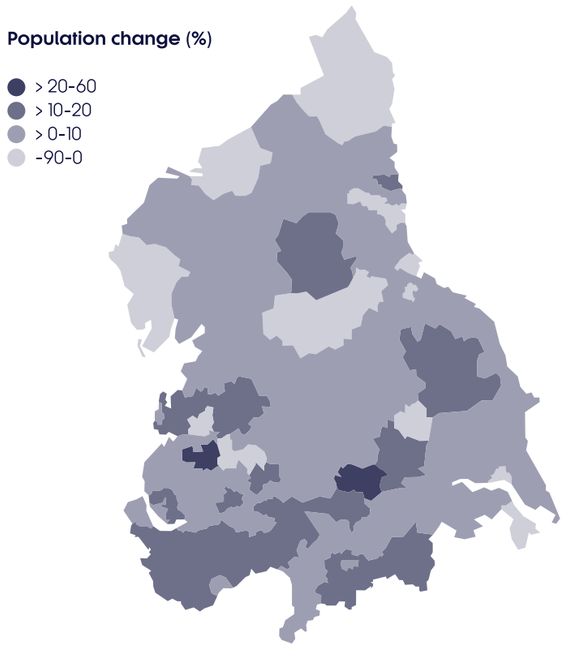


Data Source - TfN Analytical Framework. See Future Travel Scenario Technical Annex for more details here: https://transportforthenorth.com/economic-growth/future-transport-scenarios/

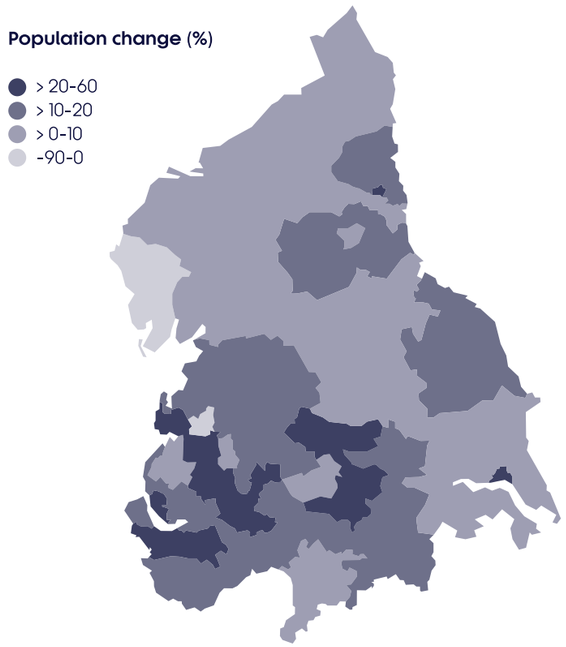
Just About Managing **Prioritised Places** **Digitally Distributed** **Urban Zero Carbon**

Figure 7: Population mapped

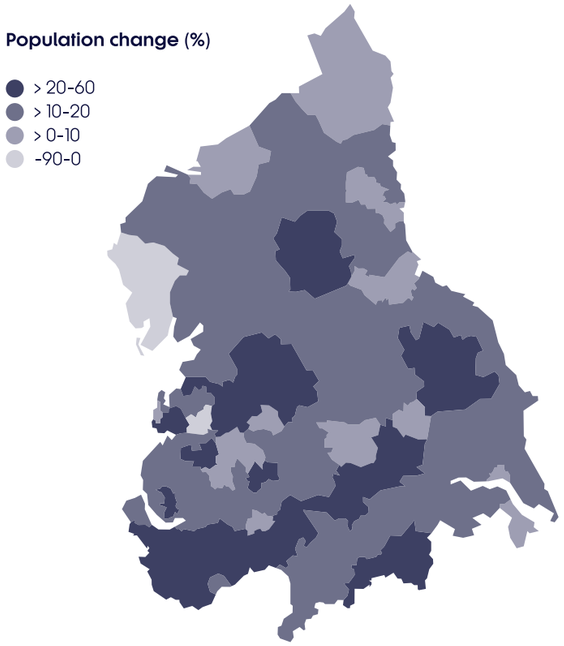
Scenario 1: Just About Managing



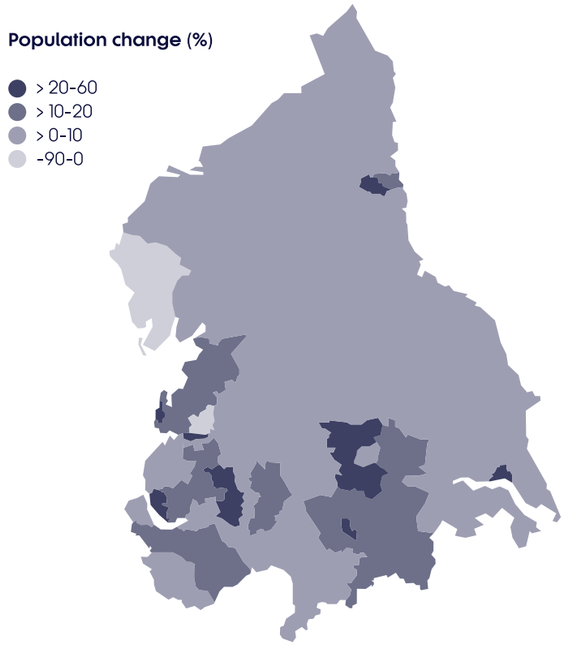
Scenario 2: Prioritised Places



Scenario 3: Digitally Distributed



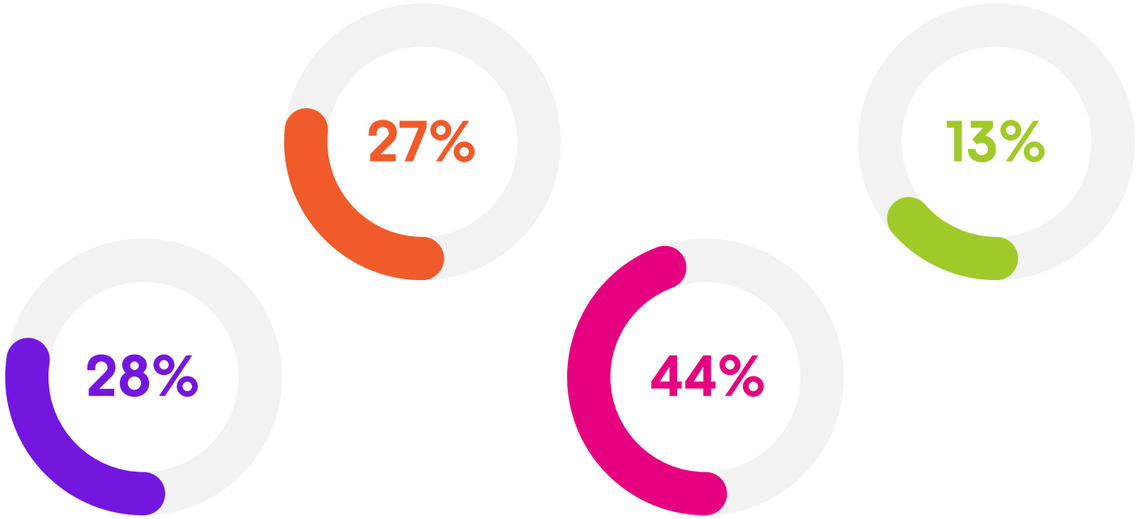
Scenario 4: Urban Zero Carbon



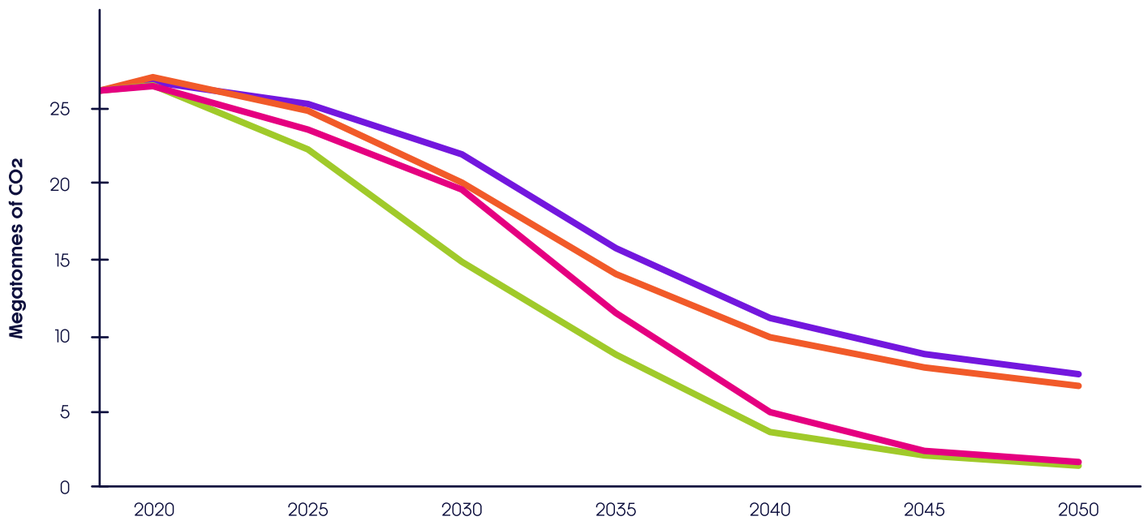
Scenario comparisons

Figure 8: Road traffic and carbon emissions

Percentage change in vehicle kms for each scenario, 2018-2050



Total emissions in each scenario

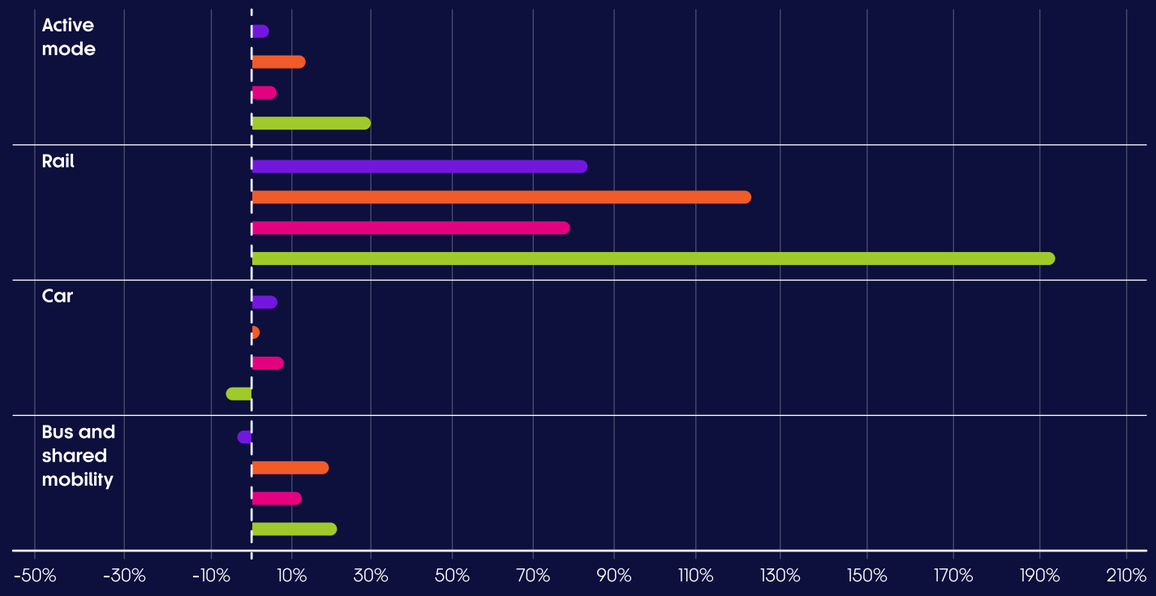


Data Source - TfN Analytical Framework. See Future Travel Scenario Technical Annex for more details here: https://transportforthenorth.com/economic-growth/future-transport-scenarios/

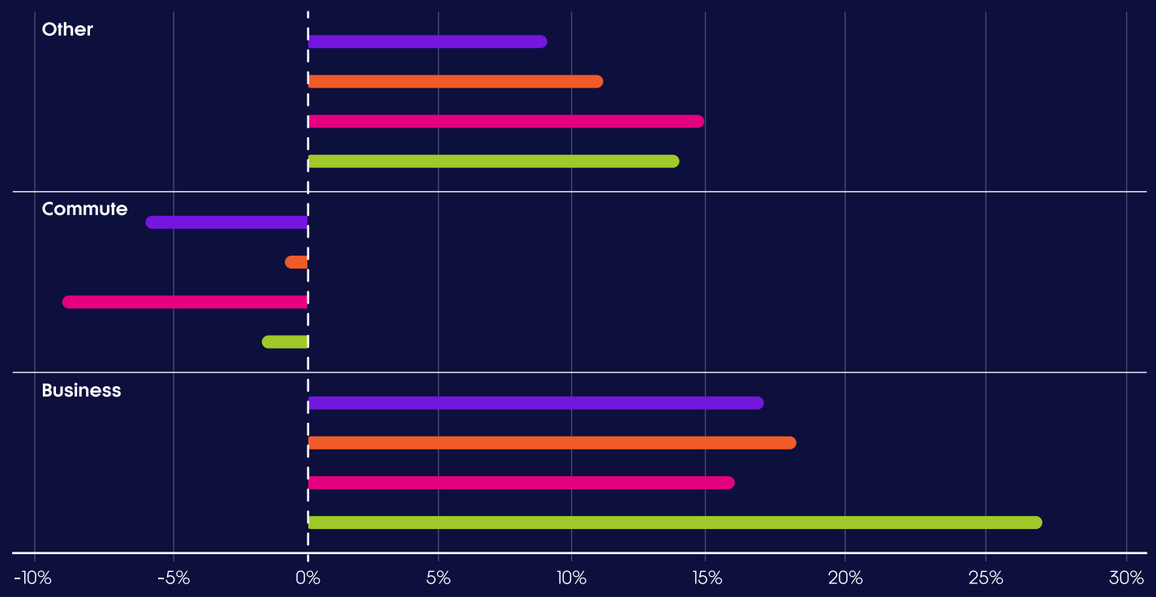
Just About Managing · Prioritised Places · Digitally Distributed · Urban Zero Carbon

Figure 9: Travel patterns by mode and purpose

Change in demand, by mode, 2018-2050, and by scenario



Change in demand, by purpose, 2018-2050, and by scenario



Transport measures and trends across our Future Travel Scenarios

Through the creation of our Future Travel Scenarios, the TfN partnership has formed a shared understanding a range of travel-related developments, policies and measures which could aid delivery of the North's vision and our Investment Programme. This final part of our visioning development involved mapping the uptake or success of these across our scenarios, creating a plausible picture of which solutions are supported within each scenario (i.e. which national and local policies; the different market conditions). The transport measures are fed into our modelling tools as levers which affect future travel demand (more information on this can be found in our full Future Travel Scenarios report). It is our intention that this foresight provides thought leadership towards the national, regional and local conditions under which the right transport-related measures thrive. Developing our own regional evidence base and embedding that within our own decision-making processes, via the Future Travel Scenarios, is a key first step to achieving this.

Further information on each future transport measure can be found within our Future Transport flashcards, provided as an annex in the full report. These are intended to communicate how we would expect various transport developments, policies and measures to play out across our scenarios (based on current understanding during our scenario development in 2020), informing future work by TfN on our Decarbonisation Strategy.

Meeting, or exceeding, the legally binding UK net zero 2050 target could potentially have game-changing effects on the type of transport demand or carbon emissions in the future. The mix of transport-related measures identified offers an opportunity to make significant progress in our ambitions for a sustainable and inclusive transport system which meets decarbonisation targets. This needs to be shaped by an integrated whole-systems approach, where sustainable low-carbon mobility is the preferred option for most trips. This requires a long-term, sustainable approach to planning, scheme appraisal and managing our environment and assets.

Transport measures and trends across our Future Travel Scenarios

Figure 10: Changes to transport-related developments, policies and measures implied by the scenarios

Just About Managing

2020

Remote working 1 day/week
In occupation types where working from home (WFH) is possible

2025

Uptake in electric vehicles
New car and van sales 60% fully electric and 40% plug-in hybrid

2030

Increase in adoption of micro-mobility
Micro-mobility included in walk/cycle travel time with average speed of 10kph

Uptake in electric vehicles
New car and van sales 100% fully electric

Increase in adoption of shared transport and mobility-as-a-service (MaaS)
Increased bus connectivity for local movements

2035

Remote working 2 days/week
In occupation types where WFH is possible

Improvements to autonomous and connected vehicles
Assumed 25% of fleet penetration

Rail decarbonisation
Fully decarbonised network

Freight consolidation and modal shift
Significant improvements in compact warehousing

2040

2045

2050

Prioritised Places

2020

Remote working 1 day/week
In occupation types where WFH is possible

Public transport fare subsidisation
Lower fares for local movements

2025

Sustainable transport access
Reduction in bus general journey time (GJT) for intra-sector trips and lower GJT for walk/cycle trips

Sustainable access to rail station
Lower access/egress

2030

Uptake in electric vehicles
New car and van sales 80% fully electric and 20% plug-in hybrid

2035

Uptake in electric vehicles
New car and van sales 100% fully electric

Public transport fare subsidisation
Further reduction in fares for local movements and other regional movements

Increase in adoption of shared transport and MaaS
Increased bus connectivity for local movements

2040

Further increase in adoption of shared transport and MaaS
Bus connectivity for all flow types

2045

Improvements to autonomous and connected vehicles
Assumed 25% fleet penetration

Increase road user costs
Demand reduction policies to improve use of roads

2050

Rail decarbonisation
Fully decarbonised network

Digitally Distributed

2020

Remote working 2 days/week
In occupation types where WFH is possible

2025

Improvements to autonomous and connected vehicles
Assumed 25% fleet penetration

Increase in adoption of shared transport and MaaS
Increased bus connectivity for local movements

2030

Uptake in electric vehicles
New car and van sales 100% fully electric

2035

Further increase in adoption of shared transport and MaaS
Bus connectivity for all flow types

Further improvements to autonomous and connected vehicles
Assumed 50% fleet penetration

Increase road user costs
Demand reduction policies to improve use of roads

Hydrogen vehicles
Available for HGVs

2040

Rail decarbonisation
Fully decarbonised network

Remote working 3 days/week
In occupation types where WFH is possible

2045

Further improvements to autonomous and connected vehicles
Assumed 75% fleet penetration

Further increase in adoption of shared transport and MaaS
Bus connectivity for all flow types

2050

Further increased intra-sector road user costs
Demand reduction policies to further improve use of roads

Urban Zero Carbon

2020

Remote working 1 day/week
In occupation types where WFH is possible

2025

Sustainable access to rail stations
Lower access/egress

Sustainable transport access
Reduction in bus GJT for intra-sector trips and lower GJT for walk/cycle trips

Increase road user costs
Demand reduction policies to improve use of roads

2030

Uptake in electric vehicles
New car and van sales 100% fully electric

2035

Public transport fare subsidisation
Further reduction in fares for local movements and other regional movements

Increase in adoption of shared transport and MaaS
Increased bus connectivity for local movements

Improvements to autonomous and connected vehicles
Assumed 25% fleet penetration

2040

Further increased road user costs
Demand reduction policies to further improve use of roads

Freight consolidation and modal shift
Significant improvements in compact warehousing

Hydrogen vehicles
Available for HGVs

2045

Rail decarbonisation
Fully decarbonised network

Remote working 2 days/week
In occupation types where WFH is possible

2050

Further improvements to autonomous and connected vehicles
Assumed 50% fleet penetration

How will we use our Future Travel Scenarios?

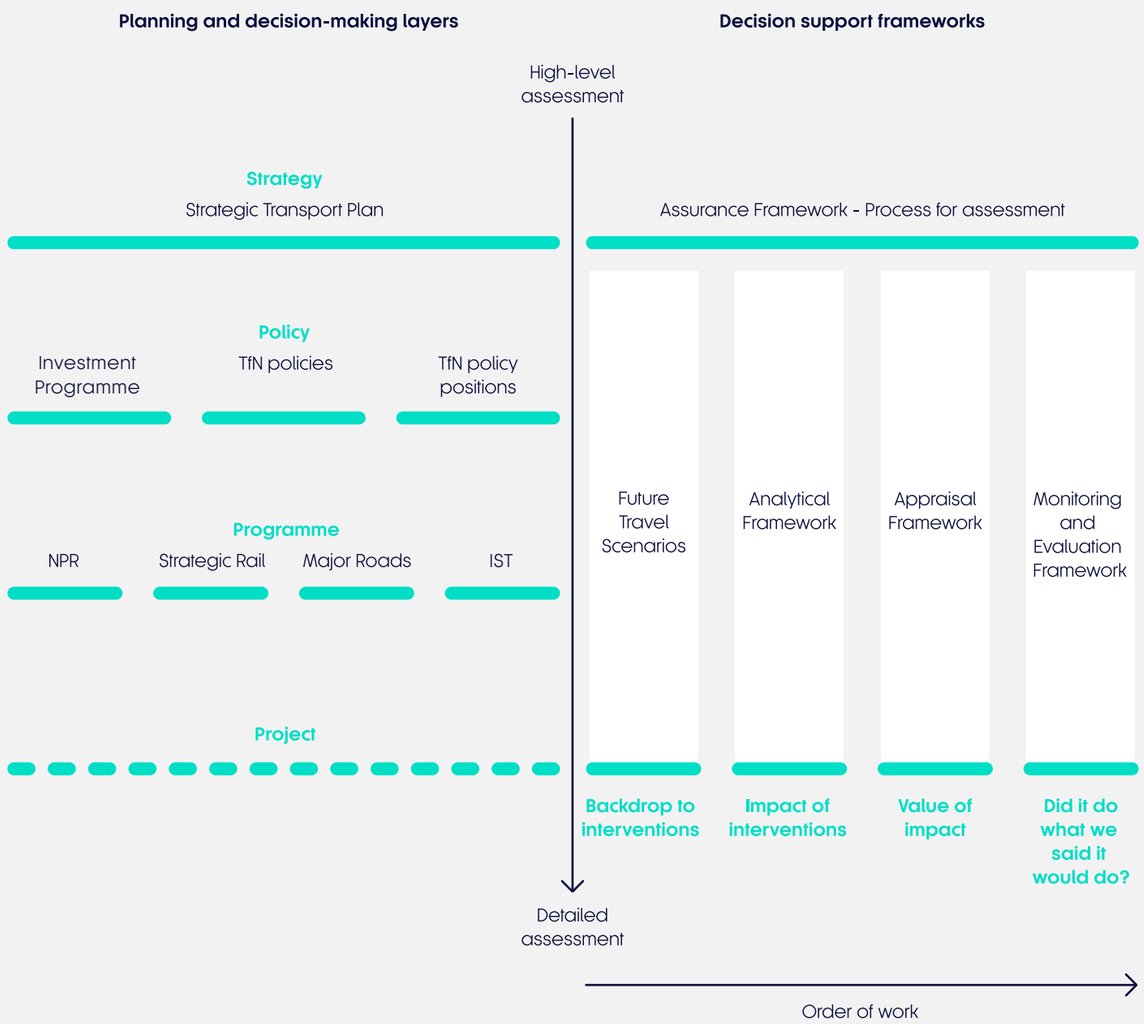
TfN is responsible for providing advice to Government on a prioritised pipeline of investments for the North's transport network that will support the economic, environmental and social objectives agreed by TfN and its elected Board. The Investment Programme is built through collaboration with TfN's local partners; and includes potential road and rail schemes, Northern Powerhouse Rail (NPR), transport policy in relation to rail franchise agreements, and Integrated and Smart Ticketing Travel (IST).

TfN also has an active evidence and thought leadership role in developing data and advice on policies outside this remit, such as active travel, electric vehicles and supporting integrated land-use and transport planning. The Future Travel Scenarios are a key tool in helping TfN develop its role in this area, as they provide evidence on how these policies could interact with the interventions covered by the core remit.

Application of the Future Travel Scenarios is not a one-off exercise but is being integrated into TfN's wider planning and decision-making processes. All stakeholders indicated that they would be uncomfortable returning to a single scenario against which to test investment decisions. This signals support for the purpose and approach of this work; and its intended application to the planning and decision making layers outlined in Figure 11.

The scenarios form one of five decision support frameworks used by TfN to develop its strategy, policies, programmes and projects towards delivery of our vision and objectives. The Future Travel Scenarios Framework sits alongside the Analytical, Appraisal and Monitoring and Evaluation Frameworks, all of which are guided by the Assurance Framework, which represents a step-by-step process for making decisions on transport interventions.

Figure 11: How our Future Travel Scenarios form part of TfN's planning and decision-making processes



How will we use our Future Travel Scenarios?

The Analytical Framework can represent both Future Travel Scenarios and Transport Strategies to provide quantitative data on performance metrics. This provides an estimate of how the impact of each strategy option, relative to a reference case, would vary from scenario to scenario.

The green, amber and red cells below represent an aggregated assessment of scheme performance using the Appraisal Framework. Underpinning each cell will be a more detailed assessment with a score against each objective and sub-criteria.

Figure 12: Use of the Appraisal Framework across strategies and scenarios

Assessment in Appraisal Framework

		Without-policy plausible scenarios			
		1	2	3	4
Strategy options tested	A				
	B		□		
	C			○	
	D				

□ Performance of strategy Option B in Scenario 2	
Objective	**Score**
N1: Transform economic performance and rebalance the economy	9
N2: Improve access to opportunities across the North	8
N3: Increase efficiency, reliability and resilience in the transport system	7
N4: Promote and support the built and natural environment	9

○ Performance of strategy Option C in Scenario 3	
Objective	**Score**
N1: Transform economic performance and rebalance the economy	4
N2: Improve access to opportunities across the North	6
N3: Increase efficiency, reliability and resilience in the transport system	3
N4: Promote and support the built and natural environment	2

TfN recognises the importance of providing transparency over how these systems are used. Each time TfN uses this approach to make a policy or investment decision, more detail will be made available on the specifics of the Appraisal Framework used, including detailed descriptions of sub-criteria and how scoring systems are implemented.

A similar approach will be taken for individual interventions and schemes as part of the business case process. TfN is developing an approach to business cases that aligns to the approach described above, which helps to show how individual schemes contribute to the overall vision and objectives of the strategy.

How to provide feedback

We will review and update these scenarios as evidence develops and trends evolve. We have built our Future Travel Scenarios Framework to act as a live and adaptive tool by allowing a mixture of light-touch annual updates and less frequent, more fundamental refreshes.

We have published an interactive online data dashboard, including maps and charts that allow detailed exploration of each future world and comparison of broad outcomes across the four scenarios. This tool is intended to provide an interactive representation of the scenarios and allow interested stakeholders to feedback on the plausibility of the scenarios to enable TfN to continue to refine them. The tool can be accessed at transportforthenorth.com/future-travel-scenarios

Collaborative engagement has been at the heart of our STP and this scenario development process, and we will continue to gather structured stakeholder feedback on the Future Travel Scenarios through planned activities to inform future rounds of scenario development. We are also happy to receive feedback via email to engagement@transportforthenorth.com

Next steps

- Our Future Travel Scenarios are fundamental in providing a plausible assessment of future travel demand, to inform a range of baseline projections for greenhouse gas emissions and the associated uptake in future transport solutions and policy measures. TfN will publish a Decarbonisation Strategy to show which transport solutions and policy measures are likely to be required to achieve TfN's target of a zero-emission transport system before 2050. The level of additional action required to achieve this target will vary depending on which TfN Future Travel Scenario is being considered. Assessing the decarbonisation 'policy gap' in each scenario will allow TfN to develop a resilient Decarbonisation Strategy that can adapt to different future circumstances.

- In 2021, we will apply the scenarios to TfN's Investment Programme to help decide which sequence of potential interventions most closely align to TfN's strategic objectives and inform our statutory recommendations on investment in the regional transport network.

- We will also use the scenarios, and the evidence compiled to support their development, to explore what supporting non-infrastructure future transport measures might be required to complement our Investment Programme, enabling it to deliver on a broad range of objectives.

- Engagement with individuals, transport users and communities will be fundamental to delivering our broader consideration of the economic, environmental and social aspects which will affect the future travel patterns, but also the opportunities available to people, business and goods across the North. A key example of this is how our Future Travel Scenarios (including their use in our Assurance Framework, programmes and projects, and strategic development) can complement spatial planning. We will work in collaboration both at national level, informed by the Planning White Paper (led by the Ministry of Housing, Communities and Local Government), and with local authority members across the region with regards to their spatial planning and frameworks.

- Our Future Travel Scenarios have captured many of the policy positions identified in the STP and embedded this within our analytical and assurance work. The scenario development process has been a useful mechanism for facilitating discussion around TfN and partner strategic ambition to 'championing inclusive and sustainable growth' across the North. As such, the work on our Future Travel Scenarios provides one of the building blocks for future statutory advice and updates of our STP.

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