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How governments use evidence to make transport policy

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About this report

The Conservative Party's 2019 manifesto promised an ambitious 'transport revolution', but the history of previous governments shows how they have often failed to deliver their transport promises, while carbon emissions from transport have been flat for three decades, leaving it as the largest emitting sector of the UK economy. This report looks at how the UK and comparable countries use evidence in designing transport policy, and offers recommendations for how the UK can make better policy in future.

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Summary

The Conservative Party's 2019 manifesto promised an ambitious 'transport revolution', connecting towns and cities by road and rail with significant new investment, and supporting electric vehicles, cycling and walking. But the history of previous governments shows how they have often failed to deliver their transport promises, while carbon emissions from transport have been flat for three decades, leaving it as the largest emitting sector of the UK economy.

To follow through on these promises, the Department for Transport (DfT) has a significant programme that includes major reform of bus services, a promised 'gear change' in increasing walking and cycling, a review of rail franchising, and more than £60 billion of capital investment up to 2025.

But any government's programme will falter unless policy makers – ministers, civil servants and other public officials – get better at identifying and deploying evidence to inform their decisions. The use of evidence is crucial to ensure the delivery of good transport outcomes: lower carbon emissions, greater accessibility and stronger economic growth. Using evidence effectively requires government to invest in qualitative and quantitative social research and to deploy cost benefit analysis (CBA) appropriately. In the UK this also means learning from past successes such as the Cycle City Ambition Fund, as well as policies that have hit problems, such as the electrification of the Great Western main line. The government needs to use evidence to incorporate new thinking and the best of international practice as well as understanding the trade-offs inherent in any decision.

Evidence does not exist in a vacuum. Transport – like all government policy making – operates in an inherently political environment. Institutional structures are needed to commission evidence, processes need to be applied to analyse it and enough expertise must be present to understand it at all levels of government. Even with a powerful underlying evidence base, transport policies will fail without political support. A textbook example is the political decision to continue freezing fuel duty despite strong economic and environmental evidence for the fuel duty escalator to apply. It is also not always simple to tie long-term transport outcomes directly to good or poor use of evidence in policy development. Outcomes are also traded off – for example, reducing traffic congestion through increased road capacity also results in higher pollution and other negative social effects.

More fundamentally, the UK's – or rather England's – lack of an integrated transport strategy was a regular theme throughout this research, and we recommend that the DfT considers developing a new strategy integrating different modes of transport, rather than mode by mode, to improve political understanding of trade-offs and scrutiny of policy decisions in this area.

Policy making needs to be informed by political realities and what is acceptable to the public, while also shaping public perception and behaviour. Information on public preferences and how to effectively communicate policy change, often gained from mixed research methods, is an important part of the evidence base in its own right. These insights should sit alongside the purely quantitative evidence that the DfT has often prioritised.

In this report, we ask:

- What **institutions** are in place to receive and assess evidence in government?
- What **processes** are in place in those institutions to ensure good use of evidence and how is it **analysed**?
- How does government use **expertise** and **relationships**, internal and external, as part of an evidence system?
- How effective have these been in delivering transport policy?

We look at the Netherlands, Sweden, New Zealand and Germany as comparative case studies. We highlight the relative strengths and weaknesses of the UK as well as where there are opportunities to learn based on best practice in other countries.

Institutions

The UK has a strong central department but confused and overlapping wider institutional arrangements

The UK has a particularly large and powerful central ministry in the DfT, which holds most of the functions that generate and analyse evidence. Beyond the DfT, there are complex and overlapping responsibilities among other agencies and structures. For instance, the road and rail regulator (the Office of Road and Rail), rail industry bodies (the Rail Safety and Standards Board) and the transport watchdog (Transport Focus) can duplicate analysis. There are at least 20 institutions outside the main department that are involved with transport policy, regulation, advice or evidence. This also means that some policy areas, such as transport innovation, fall through the cracks and end up poorly integrated into the DfT's use of evidence.

The UK lacks a public sector research body, but this has not been a major barrier to the good use of evidence in transport policy

The UK is relatively unusual in countries we examined in not having an independent public sector research body for transport. The Netherlands has organisations such as the Netherlands Environmental Assessment Agency (PBL) and Council for the Environment and Infrastructure (RLI). In Sweden there is the Swedish National Road and Transport Research Institute (VTI) and K2 (the Swedish Knowledge Centre for Public Transport). While simply setting up such a body is not a guarantee that evidence will be well used in transport policy, these organisations usually play an important role in ensuring that evidence is independent and impartial. However, the UK's extensive academic and consultancy sector compensates by delivering most transport research and evidence needs. Given the existing arrangements, establishing a new body would be counter-productive, adding further complexity to the institutional landscape.

External scrutiny of evidence underlying transport decisions is weak

The UK parliament has a marginal role in debating or scrutinising the evidence underlying transport policy making, which leads to missed insights and inadequate challenge. This is partly because transport policies rarely require legislative change, and there are relatively few transport infrastructure bills, with most investment decisions made executively by the DfT. The absence of a national transport or investment strategy endorsed by parliament further limits the opportunity for MPs to question infrastructure priorities or the underlying evidence behind them.

The National Audit Office (NAO) is – perhaps surprisingly to some – a far more significant body than parliament in its scrutiny of the evidence base for transport policy. Its remit is focused on public spending, meaning that there is an emphasis on evidence relating to value for money. Beyond the NAO, there is a lack of external challenge relating to transport evidence. There are not always mechanisms to independently scrutinise evidence and where they do exist, such mechanisms aren't always used.

Process and analysis

The UK's analysis of evidence is effective and well-resourced, but the evidence itself should be more openly shared

The DfT has strong analytical and economic capability. It has developed well-defined analytical professions and a detailed and well-resourced system for project and policy economic appraisal (known as TAG). The UK's approach has helped to inform transport appraisal across the Organisation for Economic Co-operation and Development (OECD) and the UK remains a leader in this field.

The UK benefits from a robust evidence base for the major modes of transport, commissioned from the DfT and generated by a broad range of organisations. This evidence base underpins the appraisal and analysis system. It includes widespread use of transport modelling and is updated regularly. The DfT has also consciously 'opened up' more of its evidence base to scrutiny, whether through open data or a more transparent approach to its modelling and analysis. But some elements, such as rail data, remain closed. The DfT needs to commit to putting its remaining internal data, like rail evidence or models themselves where possible, into the public domain.

The way evidence is used to inform decisions is not sufficiently transparent

It is often difficult for the public to understand why particular policy or infrastructure decisions have been taken and how evidence has been weighed in their assessment. As England has no formally approved national transport strategy to inform decisions, parliamentarians and the media can struggle to scrutinise how policies and interventions align with overall strategic goals or other modes of transport and what the strength of their underlying evidence is. The publication of business cases or economic appraisals is relatively rare, heightening the sense that appraisals or subsequent decisions are biased for or against regions or projects.

The perception has arisen[1] that investment models and decision making tools like the Green Book skew funding decisions towards already developed areas. While the recent review of the Green Book commits the government to publication of business cases for projects and programmes on the Government Major Projects Portfolio, adopting the Dutch approach of requiring the publication of all business cases to aid debate of evidence would improve scrutiny and clarity.

An emphasis on headline value for money has downsides

The UK uses economic evidence as a key element in decision making on transport. Projects and policies are robustly analysed with the tools available and a lot of weight is attached by decision makers to the benefit cost ratio, a key aspect of value for money. But this comes with downsides. It does not always account well for uncertainty in travel demand and this evidence can reassure decision makers with false precision. It also leaves poorly trained decision makers vulnerable to the biases that tend to emerge in cost benefit analysis, like poorly serving projects that reduce road capacity. Recent changes to the Green Book announced alongside the Spending Review may go some way to reducing this emphasis.

Evaluation is poor across all case studies

Almost every interviewee in every country identified evaluation as a problem for transport policy making. This is a point the Institute for Government has made before,[2] alongside other research organisations, and something also recognised internationally by the OECD. Transport infrastructure investment is poorly evaluated in most countries, particularly for smaller projects, and policy decisions are often not evaluated at all. While the UK has pockets of good practice in Highways England and centrally, this is not becoming embedded more widely in the transport industry. It has not been a consistent political priority and consequently the right skills and resources are not in place, particularly at local levels.

Expertise and relationships

Staff turnover is not damaging the UK's central capacity for analysis

The DfT's analytical professions suffer less from rapid turnover than the wider civil service, meaning that in general the skills and knowledge are in place to understand and administer complex transport evidence. The size of the DfT allows most analytical professionals to move around without leaving the department by having expert teams both centrally and within modal policy areas.

Turnover among the policy profession in the DfT remains high, though it is not as high as in other departments.[3] Excessive churn is a complaint we found across all comparator countries, despite the levels of turnover differing widely. More should be done to retain skills and embed effective knowledge transfer within the policy profession, whether through joint learning and development with analysts, more secondments to and from other tiers of government, or more effective processes for handover and career incentives to slow turnover, as the Institute for Government has previously recommended.[4]

The UK's transport academic sector is extensive and internationally recognised, performing many of the roles of a national research institute

The UK relies on research from its extensive transport academic sector, combined with quasi-research agencies like the Connected Places Catapult.* The UK's transport academic sector is well-developed and is a national asset, informing government evidence bases and exported internationally. But with few transport-specific centres for doctoral training, there are risks this strength could erode.

Our comparator countries often use government (or government-associated) institutes that have formal responsibilities for transport research. The UK no longer benefits from this directly after the privatisation of the Transport Research Laboratory in 1996. Research institutes with formalised relationships with the central department and protected independence do have greater ability to dissent without being excluded from the process, but while neither approach necessarily leads to better use of evidence, the DfT could take further steps to ensure it engages with critical voices. This might include building on the success of the Joint Analysis Development Panel, created in 2015 to provide expert advice to the DfT on modelling and appraisal, as well as actively seeking to include those more critical of the DfT approach.

* Formerly Transport Systems Catapult, it is part of the Catapult Network, which is designed to drive innovation in key sectors.

Recommendations

Based on our analysis of the use of evidence in transport policy in the UK and in comparator countries, we have a number of recommendations:

Ministers

- Ministers and senior responsible owners should retain evaluation responsibility for policies and large projects after delivery. **The Transport Select Committee should be able to recall ministers and senior responsible owners*** **to discuss these projects even after they have changed role.**

- Ministers and new senior civil servants in the DfT should have a greater understanding of the principles underlying transport evidence, modelling and appraisal. Ministers and special advisers with an involvement in transport **should be offered formal training in the sources, types and uses of transport evidence.** This might be provided by the civil service or by an external provider such as a consultancy or university. Its benefits should be endorsed by the prime minister and supported by the cabinet secretary.

Department for Transport

- The DfT should support the National Infrastructure Strategy with co-ordinated investment plans, update National Policy Statements and consider **a new strategy integrating differing modes of transport** rather than individual strategies for rail, road, aviation, maritime, buses, cycling and walking.

- The DfT should publish the strategic and economic cases for all transport projects and policies that it approves, with key data, including net present value and benefit cost ratio **indexed and easily searchable** in order to improve scrutiny of decisions. The DfT should also **record how the different forms of evidence were weighed and which were prioritised** in the decision making on these projects.

- Remaining areas of transport evidence that are not available for public access, such as the Passenger Demand Forecasting Handbook, should be opened to external scrutiny where possible.

- For projects the DfT funds at local or regional levels, such as those that receive money from the Transforming Cities Fund, **the money provided to those local areas should include specific ring-fenced revenue to fund evaluation.** These funds should be made available for the standard periods of transport evaluation (one and five years after completion) and could amount to around 1% of project budgets. These should be in addition to any wider evaluation the DfT undertakes of whole programmes.

- The DfT should improve local analytical capability and its own knowledge of the challenges of policy implementation through **pursuing more secondments to and from other tiers of government.**

* The senior responsible owner (SRO) is the civil servant accountable for ensuring a major government programme or project meets its objectives and delivers the projected outcomes. The SRO is responsible for the business case.

Parliament

- The Transport Select Committee **should carry out regular 'evidence checks'** on the evidence that the DfT uses for key policies.

- The Transport Select Committee **should take a greater role in scrutinising the ex-post evaluation of transport policies and projects**. It could do this on its own, but a more powerful approach would be to work with the Public Accounts Committee and the National Audit Office to set up joint inquiries. These could include looking at accounting officer assessments of how evidence had been used. **It should also formally review the DfT's monitoring and evaluation strategy and updates to the monitoring and evaluation programme.**

Professional bodies and transport organisations

- Local and sub-national government must develop their evaluation capability. Organisations such as the What Works Centre for Local Economic Growth, National Infrastructure Commission, sub-national transport bodies, the Local Government Association (LGA) and Urban Transport Group should **pool knowledge and resources with local and regional government on conducting transport evaluations**. This could include combined authority or sub-national transport body areas using their economies of scale to undertake transport evaluations on behalf of local highway authorities.

Introduction

This report assesses the UK's use of evidence in transport policy making. We compare the UK's transport policy making system with those of four other countries, and assess:

- What **institutions** are in place to receive and assess evidence in government?
- What **processes** are in place in institutions to ensure good use of evidence and how is it **analysed**?
- How does government use **expertise** and **relationships**, internal and external, as part of an evidence system?
- How effective have these been in delivering transport policy?

We have drawn on 50 interviews across the five countries with officials, academics, politicians, advisers and campaigners from the transport sector, as well as building on earlier work on evidence in policy making by the Institute for Government.

In this project, we compare UK institutions and evidence use with those in the Netherlands, Sweden, Germany and New Zealand. We chose these countries for a diversity of institutional arrangements and approaches to transport policy.

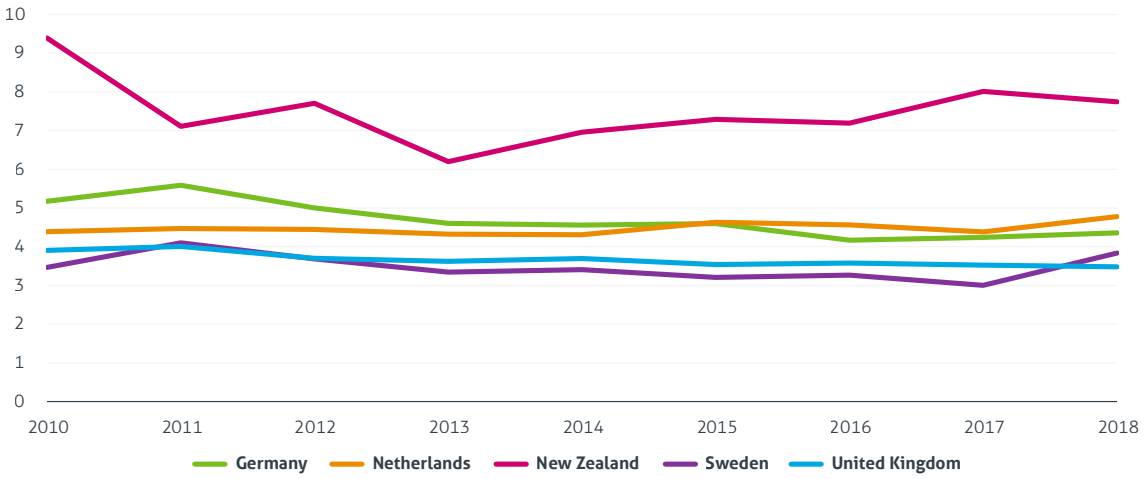
- **New Zealand** has a system that is similar to the UK's parliamentary and civil service structure, but its smaller size and innovative approaches to analysis make it a useful comparator.
- **Germany** has a large central ministry like the UK, however its federal constitution devolves substantially more transport powers and funding to lower levels of government and involves them more formally in the policy making process.
- **Sweden** also has a centralised system, but it is comprised of small ministries and large civil service agencies, which have greater operational independence than those in the UK.
- **The Netherlands'** diverse system of independent, publicly funded policy advisory bodies provides a different approach to the collection and analysis of evidence that make it a useful comparator.

Understanding the relative outcomes of a country's transport policy is not simple. For every success in a country, like the transformation of Dutch cycling levels, there are failures, such as the controversial and massively over-budget Betuweroute freight line from Rotterdam to Germany. Similarly, the 'menu' of potential policy and infrastructure

options for each country is not the same. A country with a more dispersed population and geographical constraints like New Zealand will not always be able to pursue the same sorts of policies as Germany. Outcomes are also often traded off: a country may have lower levels of congestion as it has significantly increased road capacity, driving up carbon emissions.

These outcomes are also often difficult to compare between countries, as they produce data that may not be easily comparable and often relies on perception surveys. But where this data exists, in areas like CO_2 emissions per capita from transport,[1] or the performance of road systems,[2] it suggests that the UK does not currently have significantly worse transport policy outcomes than our comparator countries. In some areas, such as road safety,[3] the UK tends to perform better than our comparators and most OECD countries. For cycling fatalities, the UK has made significant improvements over the past two decades but comparatively, it still lags behind the Netherlands and Germany.[4]

Figure 1 **Road safety in comparator countries (road fatalities per 1 million vehicle-km)**



Source: Institute for Government analysis of OECD Performance Indicators 2010–2018.

The importance of the use of effective evidence in transport policy making

Making good transport policy that meets the challenges of supporting the economy, improving journeys and tackling climate change requires high-quality, relevant evidence to be available to decision makers at optimal points in the policy making process. The government must incorporate different forms of evidence to be able to assess the full range of possible policy impacts, as well as sufficiently investing in evaluation to learn from previous policy decisions. This is all necessary to create well-designed and successful transport interventions, while minimising undesirable effects.

Using evidence effectively in transport policy making is hard. First, transport policy requires detailed knowledge of often highly technical evidence. It frequently demands a level of expertise in analysing and deploying evidence that policy generalists do not have. This is particularly the case for transport modelling, where the depth of technical knowledge required narrows the field of people who can conduct, challenge or evaluate it.

Second, policy makers generally think of transport in silos, with each mode of transport (such as road, rail and aviation) considered separately and producing its own evidence. Citizens are much more likely to think in terms of journeys from A to B, often including several modes of transportation. This leads to differing expectations and demands for evidence from different users. The benefit from travel time saving on any one individual mode of transport is highly prized by decision makers, but users will not appreciate very short time-savings on one stretch of a journey if there are delays or difficulties on another.

Finally, the complexities of transport policy making are heightened by the high stakes of large investment and public attention.* Transport is one of the policy areas with the highest capital expenditure,[5] often on large infrastructure schemes that attract a high degree of public interest. There is also often considerable media attention on the timescale and predicted costs for these schemes, putting pressure on decision makers to demonstrate value for money and efficiency. This has to be balanced against the political components of decision making, which do not necessarily easily align with value for money, such as with rural bus services.

Different types of evidence

Transport policy makers in the DfT and in devolved, local and regional government have access to a wide range of evidence from the public and private sectors, scientific research, economic and transport modelling and the compilation of transport statistics. However, no policy making process can possibly consider all the evidence available, with ministers and their advisers limited by timescales and internal analytic capacity.

In this report we consider:

- The sources of evidence and weight they are given in the evidence base.
- How these sources are interpreted and analysed.
- The role ex-post evaluation plays in evidence.

The evidence base and focus are broader now than they were historically. Transport research at national, regional and local levels has incorporated social research techniques, particularly in addressing issues of access, behaviour and inclusion. This has supplemented previous evidence that focused on economic analysis. The tension between these two forms of evidence is key and this report will examine how this diversity of evidence is incorporated and weighed in policy making.

We also examine whether evaluating projects or policies after their completion has been a weakness in transport policy making that has affected the evidence base for decision making. Political demand for evaluation and the weight given to different forms of evidence within the process varies.

* The policy problems are perceived as so significant that authors can write books entitled *Why Britain has no transport policy*, while individual project challenges are such that Peter Hall's seminal *Great Planning Disasters* devotes 60% of its discussion to transport projects.

1. Types of transport policy decisions made in the UK

There is no integrated national strategy or investment plan for transport for the UK[1,*] or England, meaning it is rare that ministers are faced with major comprehensive policy decisions across modes of transport. This contrasts with each of our comparator countries, which have either integrated investment plans[**], national strategies, or both. Within the UK, there are national strategies in Scotland, Wales and Northern Ireland. This lack of a national plan restricts the ability to consider trade-offs in transport in the round and, as we argue elsewhere, means that scrutiny of decisions is less effective.

In the absence of an overall national strategic direction in the UK or England, there are three types of decisions that are made:

- **Major infrastructure projects and programmes** – such as High Speed 2 or the Road Investment Strategy. These are decided, funded and managed centrally.

- **Small infrastructure schemes** – typically on local roads – for example, the A120 bypass at Little Hadham in Hertfordshire – or railways, such as the provision of a new station at Horden in County Durham. These have funding decided and allocated centrally but are delivered and promoted by local government, which bids for funding.

- **Individual instrumental policies** – such as on bus concessionary travel or setting a cut-off date for selling diesel and petrol vehicles.

Major infrastructure projects have specific evidence requirements, often founded in the statutory regimes that underpin them, such as the Infrastructure Act 2015, Planning Act 2008 or Transport and Works Act 1992. The secretary of state for transport is often required to undertake a quasi-judicial role in approving or rejecting these schemes. This role places a great weight on technical assessment, quantification and balancing of specific forms of evidence,[2] and means that political considerations cannot be made explicit in the decision making, even if they are influential.

* There has not been a UK transport strategy since the 1998 New Deal for Transport. The National Infrastructure Strategy does not provide an overarching policy framework or co-ordinated investment plans.

** These investment plans are known as FTIP in Germany, MIRT in the Netherlands, GPS in New Zealand and NTP in Sweden.

For smaller infrastructure projects, there are no such specific requirements and central government's role is to provide funding, rather than take quasi-judicial decisions. How and where to allocate funding is weighed internally by the DfT but there is no requirement to publish the department's overall reasoning for decisions, any explanation of how evidence is weighed or even a summary of the overall impact.

For individual policy changes, there are also fewer requirements on how evidence needs to be published or weighed. Where regulations are amended, the government follows Regulatory Policy Committee (RPC) procedure,[3] although most RPC impact assessments relate only to small portions of the DfT's work, in particular, previous European standards for rail and heavy goods vehicles and international treaty compliance for aviation and maritime.

Within this report, we consider all of these categories of decision making and will draw out how different requirements and processes for evidence can affect decisions and how they are presented.

2. The institutions that commission and use evidence

Transport institutions and powers across the UK

The UK government in Westminster develops the policy and provides the bulk of the funding for transport in England. This covers rail, strategic highways and local transport (local roads, buses, walking and cycling).[1]

Transport is a substantially devolved policy area, so in Scotland, Wales and Northern Ireland this policy making is done by the devolved administrations. Transport in the devolved nations is funded primarily through the block grants from the UK government, calculated using the Barnett formula,[2] which means that what the UK government spends on transport in England affects the funding the devolved administrations receive.

Each of the devolved administrations has set out a long-term national transport strategy. The most comprehensive of these is in Scotland, where the National Transport Strategy 2[3] sets out ambitions for the next two decades. It also feeds through into projects across multiple modes of transport, with the Strategic Transport Projects Review[4] guiding the Scottish government's investment programme to ensure it is aligned with national transport strategy and climate priorities. The devolved administrations gather their own evidence, though resources vary, with a Northern Ireland interviewee telling us about pulling evidence from Scotland, England and Wales and trying to 'piggyback' off the better-funded DfT research initiatives.

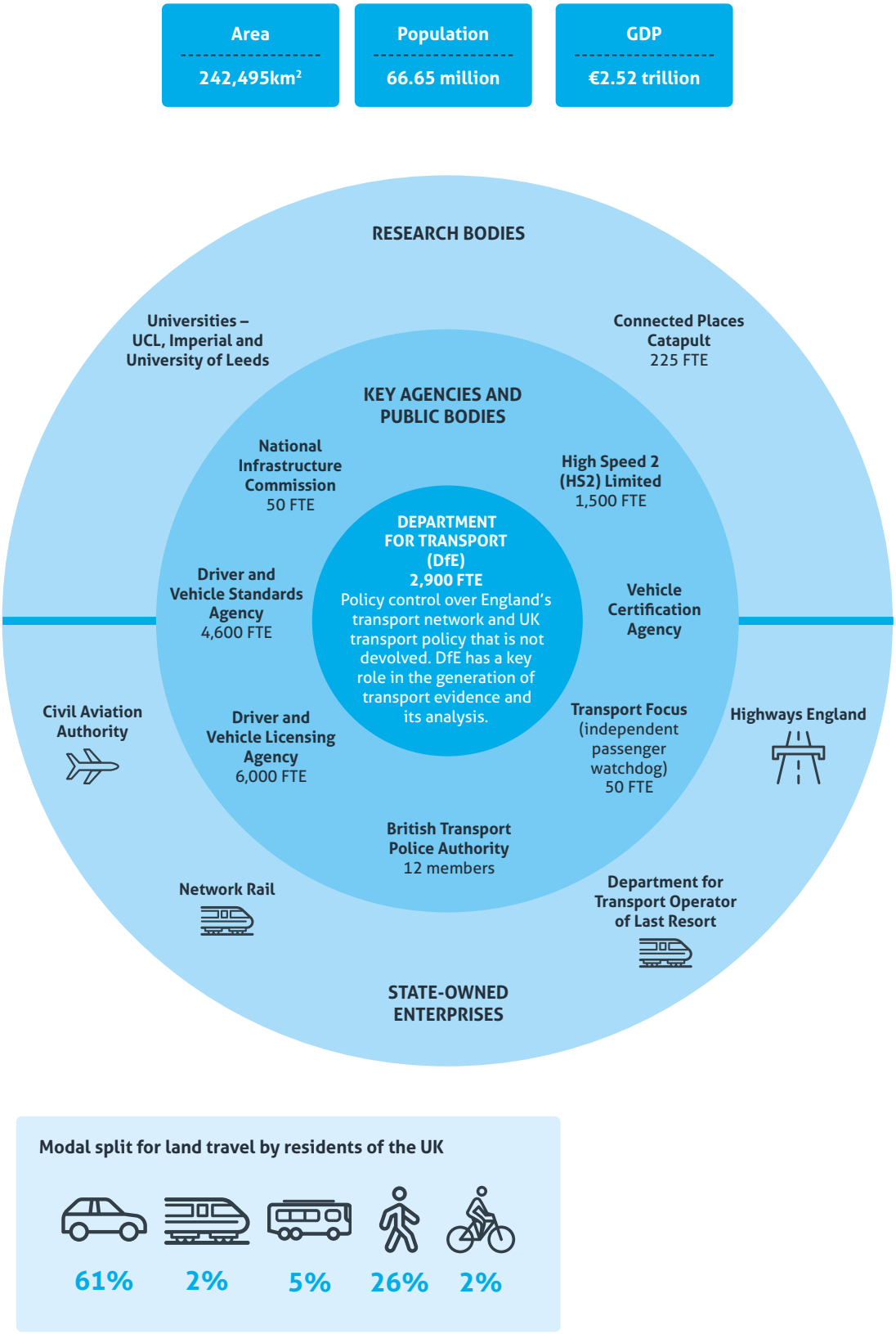
The UK DfT retains reserved powers for 'national' transport, such as aviation and maritime policy, and strategic road and rail. Only railways that begin and end in the devolved nation are devolved. In practice the interaction of transport responsibilities can be complex.

UK transport institutions and structure

The following infographic shows the transport governance system for the UK as a whole, with the DfT at Westminster as the centre. The devolved administrations and their policy and evidence systems are not included.

The UK's transport evidence system is more centralised within the DfT than in other countries. Evidence generation, analysis and evaluation are all conducted in the central department. This leads to increased capacity and skills in the centre and should allow the department to set a clear direction, but the arrangement can create political pressure on how evidence is produced, as well as leading to duplication and limiting scrutiny.

Figure 2 **The UK's research bodies, executive agencies and public bodies**



Source: Institute for Government analysis.

The UK's analytical capability is centralised in the DfT

The DfT's function extends well beyond pure policy making. It has the leading role in the generation of transport evidence and its analysis. The DfT itself does much of the research on transport in the UK, particularly on transport modelling, travel behaviour and transport policy. Other agencies, such as Highways England, do generate transport evidence relating to their policy or implementation area, but even then, they report this evidence back to the department, which takes the ultimate policy and infrastructure decisions.

Centralising the production and analysis of evidence has advantages

These advantages include:

- **Research and analysis can be directly related to the priorities of government.** Close communication and oversight means the evidence generated is more immediately policy-relevant.

- **Skills and capacity can be built within the civil service.** A centralised system that retains responsibility within a single department allows for greater institutional knowledge, research and analytical capabilities, located closer to the final decision makers.

- **Knowledge and evidence are more easily shared between analytical and policy teams.** Internal knowledge-sharing is made easier by close organisational and physical locations, removing potential barriers between evidence and policy.

Centralised responsibility also creates problems

There are also downsides, particularly where **evidence conflicts with politics** and with potential conflicts of interest. Central government research can be stopped and discarded when priorities change, as happened when transport research on citizens who were 'Just about managing' was scrapped after the fall of Theresa May's government. It can also lead to accusations of bias in the choice of which research is undertaken.

It is of course reasonable for there to be changes in emphasis as priorities move, but the DfT is so central to the production of transport evidence that it needs to take particular care to justify research based on the longer-term needs of transport as a whole. Abrupt reversals undermine its credibility in this respect, such as abandoning research on graduated drivers' licences in 2019.[5]

With the same body responsible for creating evidence, analysing it, deciding if a policy or scheme should proceed and then evaluating it, the DfT effectively 'marks its own homework' on transport evidence, with limited scrutiny from parliament and the NAO, as we discuss later in this section. Informally, it appears that the DfT manages these potential conflicts as best it can, and while we found little evidence of conflicts of interest on evidence affecting transport decision making in practice, the centralised approach builds the potential for it to arise.

A complex institutional structure outside the DfT makes it hard to co-ordinate evidence use

The DfT sits at the centre of an array of executive agencies, government-owned companies, non-departmental public bodies, public corporations and 'other entities' that are involved in some way with transport policy and evidence, including other government departments. At least 20 institutions outside the main department are involved with transport policy, regulation, advice or evidence.

Some institutions can be poorly integrated into policy making

Unclear institutional roles make it harder to co-ordinate evidence and this can continue for long periods. We found the clearest example of this with the establishment of the Connected Places Catapult. Set up in 2019 as the successor to the Transport Systems Catapult and Future Cities Catapult and with 225 full-time equivalent (FTE) employees, it is meant to help businesses and government address 'grand challenges' relating to transport innovation. But this relatively new body has suffered from an unclear role, described by interviewees as "sometimes like the Open Data Initiative, sometimes like a think tank, sometimes like a consultancy". This meant that it and its predecessor, the Transport Systems Catapult, were often sidelined from the policy process. Engagement has improved with a partnership now in place and the DfT creating the Transport Research and Innovation Board to try to co-ordinate research evidence. That it took six years from the establishment of the original Transport Systems Catapult to do this indicates that institutional oversight is not always strong.

Interdepartmental evidence is unevenly collected and used

A former DfT chief scientific adviser we interviewed said: "You get what you measure. If you measure success within your department, that is what will motivate the people within it. No one clearly owns interdepartmental joined-up-ness."[6] Transport-related evidence that crosses departmental thresholds is often poorly analysed and assessed.

The typical approach to problems across departmental boundaries in transport is to set up joint units. A number of these, such as the Office for Zero Emission Vehicles (for DfT and the Department for Business, Energy and Industrial Strategy) and the Joint Air Quality Unit (for DfT and the Department for Environment, Food and Rural Affairs) have been created in recent years.

While these have been successful in fostering a combined examination of evidence, there has not been a sufficient sense of ownership of other joint challenges, particularly for housing and transport. Here, despite a housing team within the DfT, a joint analytical board with the Ministry of Housing, Communities and Local Government (MHCLG) and regular meetings between the chief analysts of the DfT and MHCLG, policies are not always co-ordinated on the ground[7] and nor are the same sorts of evidence consistently considered.

When departmental evidence priorities aren't shared, there are poor outcomes, with the flagship garden communities programme producing car-dependent places that are unlikely to meet wider government goals, such as combating climate change.[8] As the Royal Town Planning Institute has noted: "[T]he transport and land use planning systems are therefore dependent on each other to deliver the outcomes we need, but each operates largely in isolation."[9] This challenge even extends to delivery agencies. We heard about particularly 'modal' working on housing, with instances of limited co-operation between the strategic road and rail bodies and local authorities on how to unlock growth.

The National Infrastructure Commission provides an alternative perspective to the DfT

The National Infrastructure Commission (NIC) is an executive agency responsible for preparing a national infrastructure assessment once in every parliament and providing strategic advice on infrastructure to the government. Previous Institute for Government research identified the establishment of the NIC as a positive step[10] and it has the freedom to develop evidence without the constraints of either existing analytical guidance (which we discuss in Chapter 4) or perceived political interference.

Interviewees told us that this gave the NIC the freedom to look at evidence more broadly and develop innovative techniques, like its work on urban capacity analysis.[11] Here, it can provide an authoritative and independent alternative perspective. We heard that the NIC is not perceived as having a 'scheme to sell' and can maintain relationships with DfT analysts. But given that it sits outside the DfT, it can be hard to trace this use of evidence directly back to changes in central government policy.

Local government is inconsistent in its collection of evidence, which damages policy delivery

Local government has an important role to play in the operation of any transport system, as well as policy making, so how local authorities use evidence is also important. Information gathered by local teams about what is happening on the ground also helps central government understand the impact of its own policies.

But local authorities' collection and use of transport evidence is inconsistent. There are 156 highway authorities in England and the fact that, as the Local Government Association (LGA) told us, they "all collect evidence in a way that suits their needs",[12] means it can be collected inconsistently. Many are also poorly resourced to collect and analyse it and the DfT does not always have a clear picture of local capacity or data. For example, local authorities collect different forms of local bus data on patronage, reliability and vehicles, but the DfT does not bring it together to monitor the sustainability of the bus system in response to government interventions.[13] Similarly, issues with local consistency and siloed working limit the effective use of highways data.[14] Here, the issue is both with local resources and with co-ordination, where neighbouring authorities may collect data in quite different ways.

This has practical implications: some policies planned centrally struggle when confronted with limited resources or data locally. With the emergency active travel fund in 2020, where councils were encouraged to give additional road space to cycling and walking by widening pavements or introducing temporary cycle lanes, the DfT tried to prioritise quick delivery of schemes early in the first Covid-19 lockdown. It did this by changing statutory guidance to amend advertisement requirements and encouraged local authorities to have "swift and meaningful"[15] plans to reallocate road space. But effective delivery was held back by poor local data on cycling and walking, meaning that schemes were not always well used, as well as a lack of local capacity to deliver in short periods of time. The same is true of the stuttering programme to deliver clean air zones in England, where a central government lack of knowledge of local structures, politics and geography hindered central–local collaboration.

Scrutiny of evidence is inadequate

In this centralised system, oversight and scrutiny of the evidence informing transport policy decisions is essential to ensure good decision making. It is not clear as things stand that evidence is regularly and robustly scrutinised by bodies outside central government.

This can be seen in parliament, which has only a marginal role in much transport policy making. This is partly a consequence of relatively few transport infrastructure bills being passed by parliament (with the exception of the hybrid bill* process for HS2). Transport policies only infrequently require legislative change, and most investment or policy decisions are simply made by the DfT. Transport policy and spending is also done at the local level, where parliament has effectively no oversight. Instead, the accountability for this spending, correctly, falls to mayors or councils.

Parliamentary oversight is primarily provided by the Commons Transport Select Committee. While it plays a prominent role in examining transport decisions, it has limited resources and no formal role in examining departmental evidence beyond its work on wider transport inquiries. A new House of Lords committee on the built environment will be established in spring 2021, with a recommended remit that will cover access to transport, land use, affordable and sustainable homes, the location of education and health provision, and planning policy more generally.[16] While it will have similar limitations to the Commons select committee, it may be an opportunity to improve scrutiny of cross-cutting transport and infrastructure policy and its underlying evidence.

Local scrutiny is also variable, with transport being just one part of the remit of local authority scrutiny committees, who have constrained resources. While there are mandatory external assurance checks for centrally funded local transport schemes, they mostly engage with whether the project meets set criteria as part of the central government transport analysis guidance (TAG) system rather than undertaking detailed scrutiny of the project itself.

* Hybrid Bills typically concern works of national importance that are located in a specific area of the UK. Both Houses of Parliament debate these Bills and they go through a longer parliamentary process than Public Bills

This arrangement leads to poorer use of evidence and missed insights. As Baroness Kramer, minister of state for transport between 2013 and 2015,* noted, there is "no sense that the expertise in parliament could be used to evaluate and take up new approaches. Parliament is typically seen by ministers as an obstacle to be overcome not a resource to engage with to consider the evidence for projects."[17]

Outside parliament, the institution that has the most significant role in the scrutiny of transport evidence is the National Audit Office (NAO). It has historically reported after the delivery of projects,[18] but auditors are increasingly becoming involved during their development too, given the significant amounts of public money often involved. We heard that inside government, regardless of the size of the parliamentary majority, more importance is given to the NAO examining a project than the Transport Select Committee. Occasionally, the NAO and the Transport and Public Accounts Select Committees work together closely, particularly on complex financial topics such as rail franchising.

It is the spectre of a future investigation that officials and ministers have in mind when making decisions about evidence use. But the NAO cannot question policy, so it focuses on examining if the government has achieved its objectives and how it has spent public money. This remit means there is a narrower focus on evidence relating to value for money, and other forms of evidence like social research do not receive equal scrutiny. Where evidence sits outside of standard value for money assessment, it is not clear who outside central government takes the role of scrutinising its adequacy.

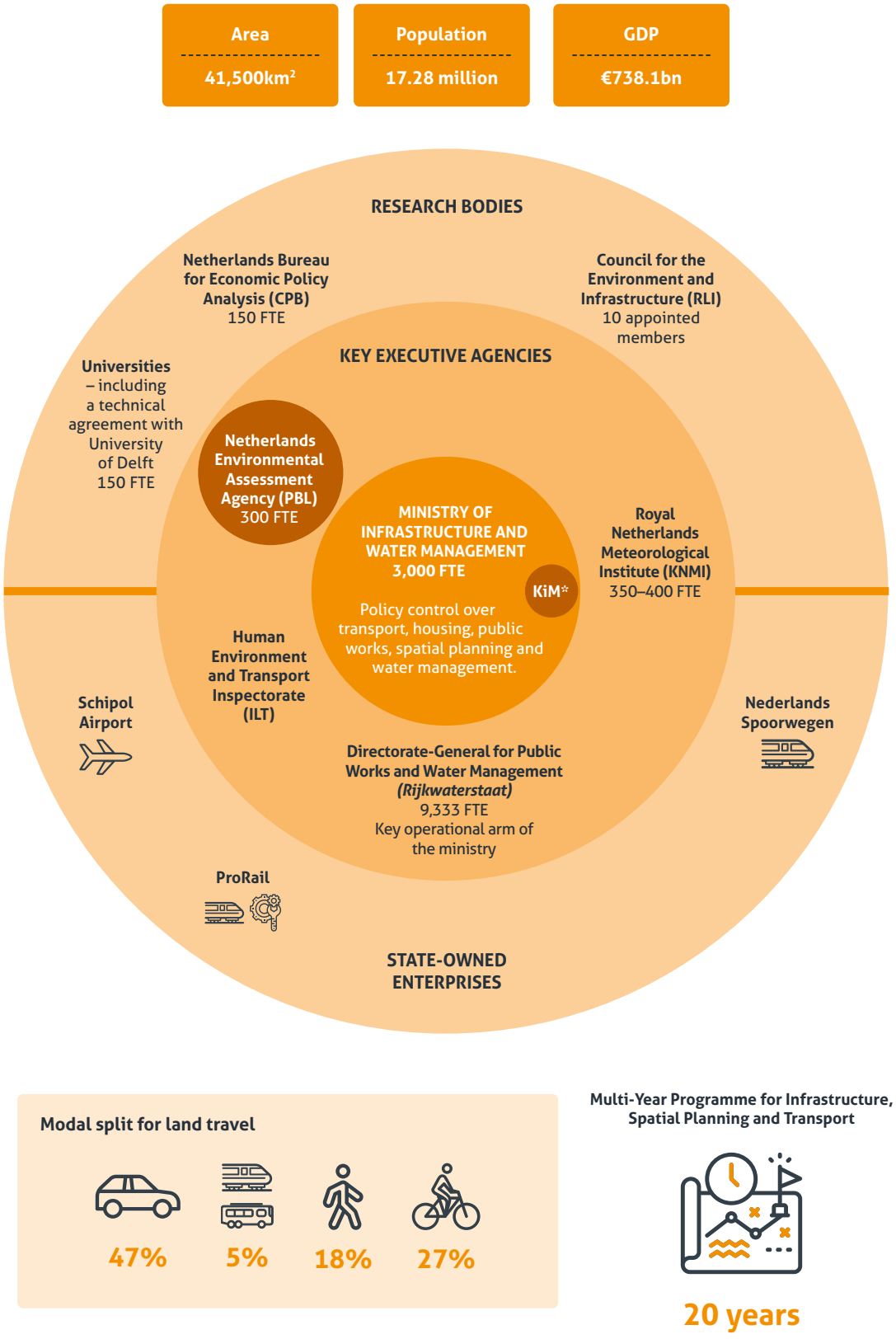
Overseas comparisons

The institutional make-up of the transport policy making systems across our comparator countries differs extensively. The following graphics show the public bodies involved in the generation of evidence, creation of policy, and delivery of transport outcomes. The key policy making department appears in the centre, whether large with thousands of full-time equivalent employees (FTE) or a small, central team. Some countries, such as the Netherlands, have one department with control over multiple large policy areas, such as transport, housing and water management, whereas others, like New Zealand, have a department that focuses solely on transport policy.

Differences can also be seen in the research bodies that generate evidence, and whether they are independent or executive agencies of the central department, and where responsibility for delivery of policy lies.

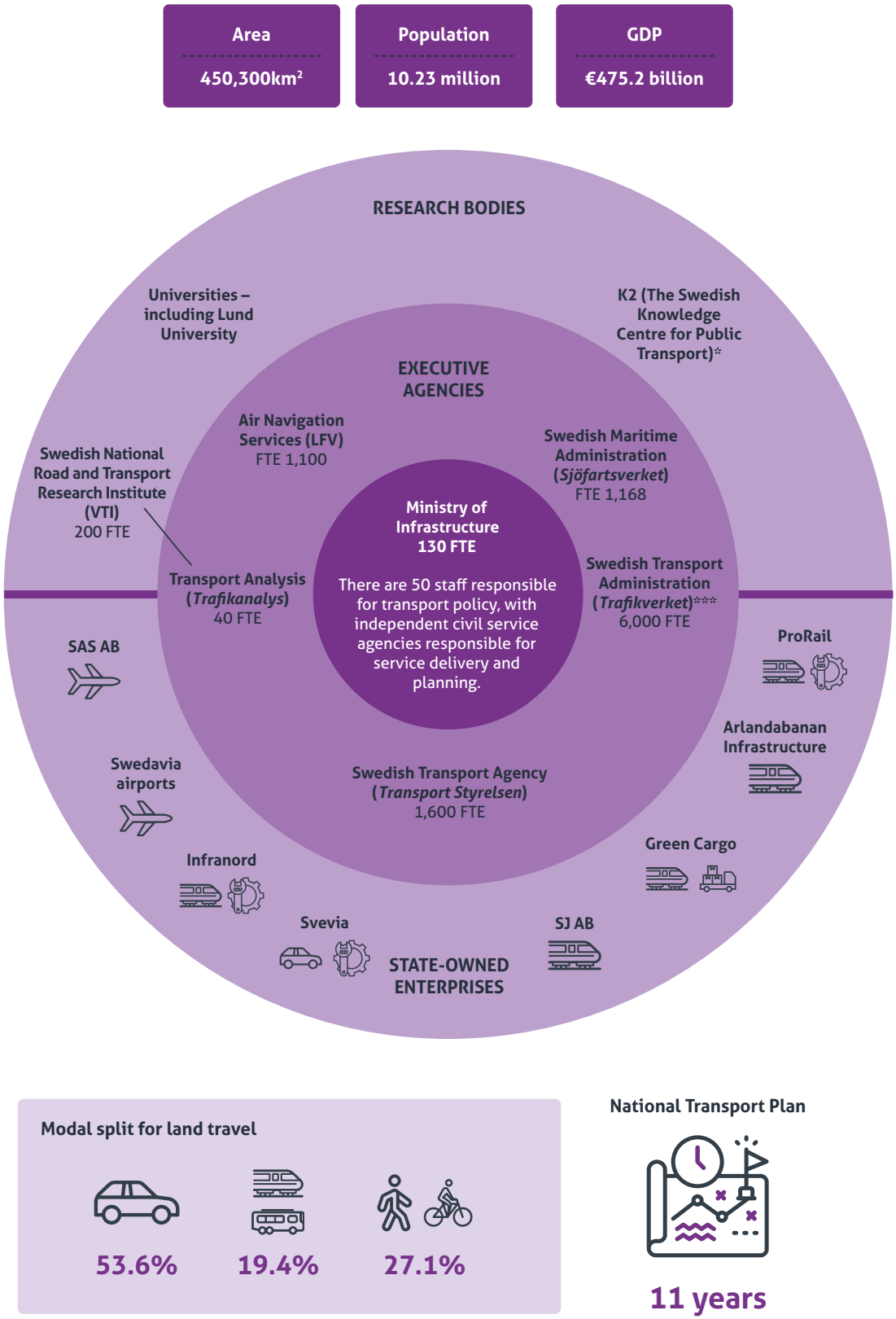
* Baroness Kramer is an Institute for Government board member.

Figure 3 **The Netherlands research bodies, executive agencies and public bodies**



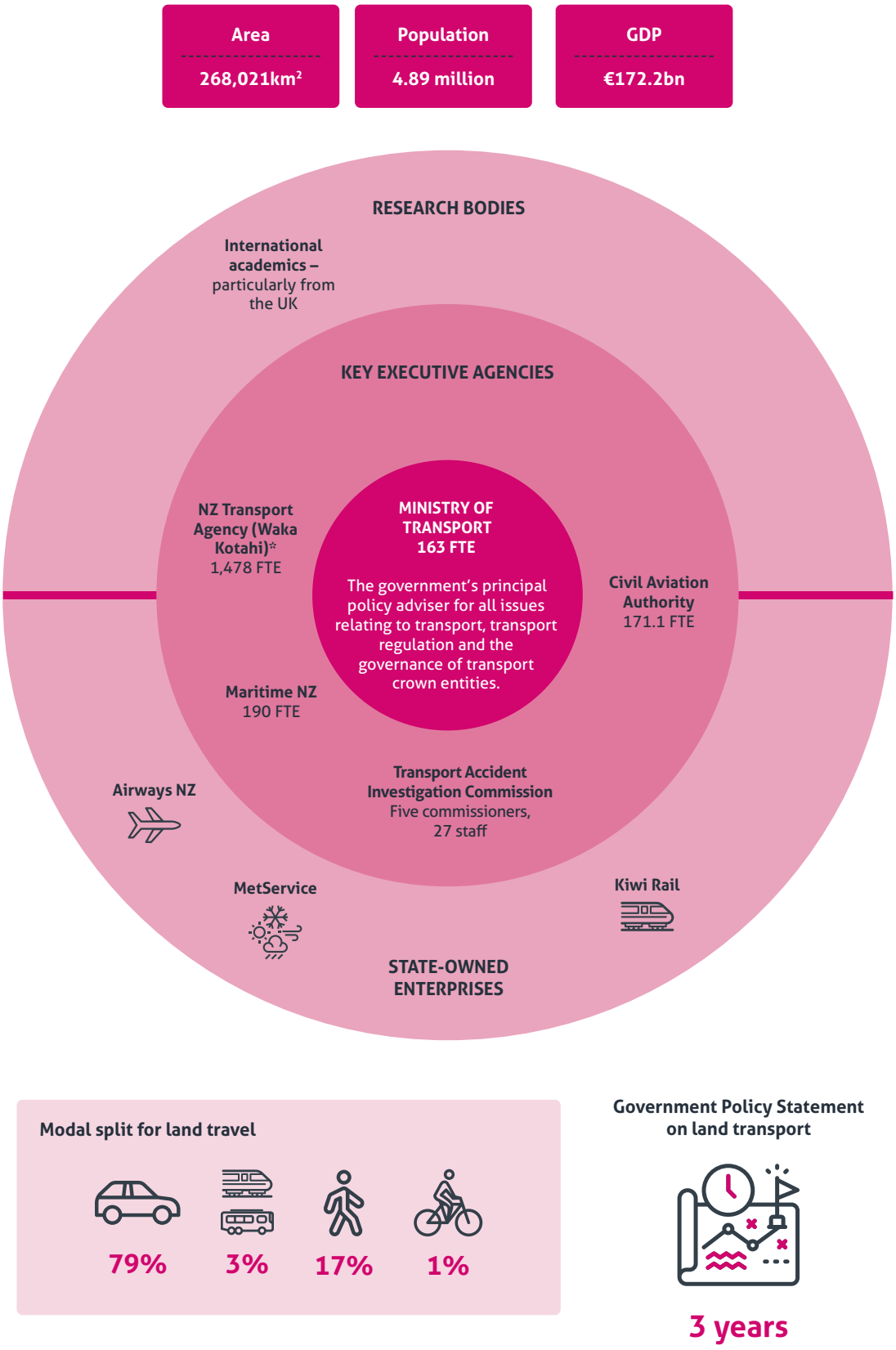
Source: Institute for Government analysis of Source: Statistics Netherlands (CBS) (Netherlands Travel Survey (OViN) 2016 – data adapted by KiM). * KiM = the Netherlands Institute for Transport Policy Analysis.

Figure 4 **Sweden research bodies, executive agencies and public bodies**



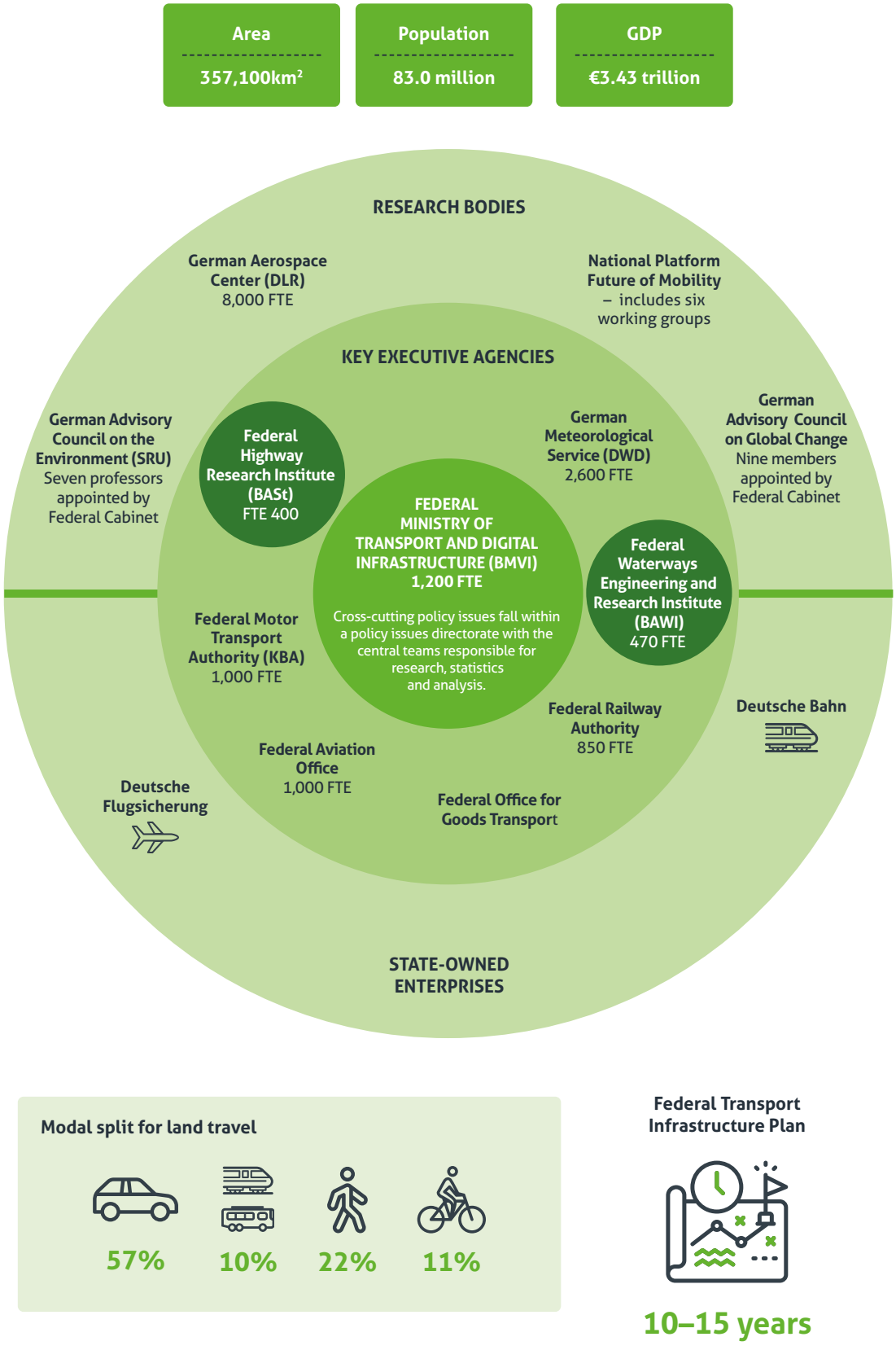
Source: Institute for Government analysis of Kenworthy J, *Sustainable Mobility in Swedish Cities*, Nationellt kunskapscentrum för kollektivtrafik, February 2019.
* A 'virtual' institute with 50–60 part-time staff, and a limited physical presence, sponsored by industry, government and academia.
** A small agency, with most employees working in departments of Statistics, Outlook and Evaluation.
*** The majority of evidence analysis is undertaken in the Market and Planning directorate.

Figure 5 **New Zealand research bodies, executive agencies and public bodies**



Source: Institute for Government analysis of New Zealand Ministry of Transport, Household Transport, 'HD002 Mode share of trip legs'. * The land transport delivery agency with considerable government oversight. It is divided into nine thematic groups and four regional relationship directors.

Figure 6 **Germany research bodies, executive agencies and public bodies**



Source: Institute for Government analysis of Bundesministerium für Verkehr und digitale Infrastruktur, Mobility in Germany, September 2019.

Research institutes

The majority of countries examined use government-funded research institutes to provide evidence

Across the majority of our comparator countries, public research institutes play a key role in the generation and analysis of transport evidence, though the institutional set-up of these bodies and the roles they play differ (see Annex A for more detail).

In the Netherlands, government-funded research institutes are the primary suppliers of transport evidence, as there is limited capacity within the ministry to generate it.

In Germany, the Federal Ministry of Transport and Digital Infrastructure (BMVI) has formal responsibility for assessing evidence. In practice, however, among the wide range of subsidiary executive agencies there are two that conduct the majority of the technical research: the Federal Waterways Engineering and Research Institute (BAW) and the Federal Highway Research Institute (BASt). These are effectively the research arms of the ministry for reviewing technical (primarily engineering) evidence on a range of transport issues. In addition to this, there is a separate research body, DLR (the German Aerospace Centre), which undertakes transport and aerospace research, but is not formally an agency of the BMVI.

While there are no formal independent evidence advisory bodies on transport in Sweden, the Swedish government directly sponsors one independent research body (VTI, the National Road and Rail Transport Institute) and indirectly sponsors another (K2, the Swedish Knowledge Centre for Public Transport, which is also funded by research councils and regional bodies). These bodies are charged with both developing evidence for Trafikverket (the civil service agency for transport) and the government, and advancing transport evidence and research more widely.

New Zealand and the UK are relatively unusual in not having a formal government-funded research body for transport.* The UK DfT fills this gap with the strength of the transport academic sector as well as private research organisations and consultancies, but in New Zealand the lack or underutilisation of local researchers causes the ministry to frequently turn to academics from the UK or Australia.

Research institutions have operational independence to develop evidence and challenge assumptions

While these research institutes in the Netherlands, Sweden and Germany receive government funding, they have substantial independence and a remit to develop evidence that goes beyond an electoral cycle or the political interests of the government of the day. Research bodies that have formalised relationships with the central department and protected independence also have greater ability to dissent and bring in countervailing evidence without being excluded from the process.

* This role was filled between 1933 and 1996 in the UK by the Transport Research Laboratory, now owned by the Transport Research Foundation, and is partly currently filled by the Catapult Network.

Operational freedom is key in the Netherlands, where there are strict protocols and guidance that protect the independence of the research institutions. For example, the *planbureaus* have a fixed budget and are responsible for their own work programmes. While they are in communication with the ministries to ensure the work is relevant, the ministries are not responsible for asking the research questions (unlike for KiM) and are not permitted to give the *planbureaus* any instructions regarding content or research methods. CPB and PBL ask what they think the ministry *should* want to know and can take a 'bigger picture' approach than in-house analysts would be able to do.

RLI also creates its own work programme, which gets 'rubber-stamped' by the ministry.[19] Its work focuses on issues that fall between departmental areas, which we heard were contested with departments placing the blame for gaps on each other before RLI's establishment. RLI views itself as a 'countervailing power' to the departments, but while it seeks to get civil servant ownership of a project early on, RLI's reports are not necessarily accepted or always influential.

This role is similarly filled by the advisory councils in Germany, which provide an external check on government evidence and policy (like the Advisory Council on the Environment, the SRU; or the Advisory Council on Global Change, the WBGU). However, these can be seen to be pushing their own beliefs rather than providing a neutral view of evidence and then have limited influence. There are also professional standards bodies like the Road and Transport Research Association (FGSV) that provide technical advice, which is seen to remove some potential conflicts of interest in evidence production.

Research institutes are being used less by policy makers seeking quick answers

Government funding does not guarantee the use of the evidence provided by the research institutes, and we heard about institutes being increasingly sidelined or bypassed in a number of countries. Governments were instead often turning to transport consultants who could provide quicker responses that may be more politically amenable. This was the case in Sweden and the Netherlands where, despite the prominence and reputation of the public research institutes, with the OECD describing them as "world-class" with a "worldwide reputation for scientific excellence",[20] their use has declined over the past 10 years. While using consultants may bring evidence into government more quickly, it means that the institutes' role in challenging policy and use of evidence is bypassed.

These bodies may also be bypassed when they do not communicate their value and role effectively or clearly. We saw this in the Netherlands, where there were criticisms of the multiplicity and intersecting remits of the five key research institutes. An interviewee compared transport unfavourably to the Dutch water sector, where a large public institute covers 60–80% of all water safety and water quality work, as opposed to the diverse range of bodies with overlapping roles in transport. These overlaps also create a reputation for infighting and their remits can be unclear to those outside the sector. Where there are research bodies, consolidation and clear roles are essential.

Close links between research institutes and ministries help the acceptance and use of evidence

The close links between the institutes and their 'parent' ministries helps research be accepted and listened to by decision makers, as well as ensuring the research topics the institutes pursue are relevant. We heard that this is particularly the case in the Netherlands, where the institutes are good at integrating scientific knowledge in a way that it is useful and efficient for policy research.

The links are closest with KiM, which is situated fully within the Dutch ministry. At a basic level, KiM's research agenda is the responsibility of the ministry, and its research is communicated via official ministry channels. In practice, the research questions are always subject to discussion and KiM also proposes topics, as well as being responsible for the methodology, data analysis and presentation of the evidence. Policy makers inside the ministry accept and use this evidence readily as it is seen to have come "from colleagues".

The Swedish set-up and culture also allows more permeability between academia, research and practice than in the UK. An interviewee noted that "it matters on your CV whether you have engaged with applied policy, sometimes worth more than teaching and published research"[21] and that this had a positive impact on evidence, as the latest ideas in academic practice flowed into government and vice versa. Someone who had worked in both Sweden and the UK told us: "[It's] striking that there was a much greater readiness in industry and government to interact with academia and use research outputs – much greater in Sweden than ever in the UK."[22] There was also more movement between academia and local/national government, with academics often seconded part-time to local and national government.

Local and regional government

Different constitutional arrangements put some local governments closer to policy making

Our comparator countries have different constitutional and institutional arrangements for how sub-national government is included within transport decision making. These range from the federal system in Germany – where powers are formally split between the state (Länder) and federal level in the Basic Law (Grundgesetz)[23] – to systems such as New Zealand's, which is more centralised and similar to the UK's.

These arrangements result in different levels of access to the policy process. In Germany local and (particularly) regional government is formally far more engaged with national policy making and is a key part of both policy formulation and evidence collection. Other countries have specific arrangements for working with local government on evidence collection and analysis. For example, Local Government New Zealand is a key part of the country's Transport Evidence Base Strategy structure and processes. But practice differs widely across comparator countries, and interaction often happens in a more ad hoc way.

Regional government is most involved in national investment strategies and plans
All our comparator countries have some form of national transport investment plan or strategy, although the scopes and timescales of these differ. Interviewees in each country told us that this was where local and regional government could be most influential in terms of transport investment.

The actual processes used also varied. The Netherlands has a multi-year programme for infrastructure and spatial development,[24] debated in parliament and subject to a complex agreement process, while the New Zealand government policy statement (GPS) on land transport is more of a dialogue between the government and regional transport committees.

The national investment strategies and plans also represent a complex interaction of evidence and local lobbying. Some regions, like provinces in the Netherlands and the German Länder, are considered to be institutionally capable of deploying and using their evidence effectively to promote schemes to central decision makers and funders. We discuss this more in Chapter 4 and local and regional capacity more broadly in Chapter 5.

Institutional effectiveness of evidence use

From these international comparisons we can draw a number of conclusions about the effectiveness of different institutional arrangements in how countries use evidence to inform transport policy.

The first is the **size and role of the central department or ministry**. In the UK, the DfT conducts the majority of its evidence collection and analysis either internally, or through closely related agencies. This contrasts to countries with either far more dispersed responsibilities for evidence (such as the Netherlands) or those with very small central ministries (such as Sweden or New Zealand). While the UK approach enables a more informed and expert civil service, able to reflect political priorities, it can affect the perceived or actual independence of evidence. In such a centralised system, it is important that evidence is not only independent but that those preparing it do not feel pressure to moderate their evidence to fit political narratives. This is typically achieved through either formal separation of roles or increased scrutiny relating to evidence.

Even with a large central department that has had relatively few changes compared to the rest of government, there is still **institutional churn and complexity** in the UK transport system that reduces the effectiveness with which evidence is collected and used. There are areas of duplication and overlap in rail and road and issues that seem to fall between the cracks, such as transport innovation. This is inevitable to some extent in any such system, but we were struck by the contrasts in institutional longevity and lower complexity outside the UK. In countries like Sweden this had allowed organisations to grow into their roles and use evidence more effectively.

Perceived independence of evidence is one of the reasons other countries have **independent public sector research bodies** for transport. New Zealand and the UK are relatively unusual in not having a formal public research body for transport. Merely creating these institutions is not a guarantee that their evidence will be used. Even where they exist we heard that they can be bypassed or ignored. However, the UK is able to use the National Infrastructure Commission and its extensive academic and consultant transport sector to fill many of the gaps for evidence typically met by these bodies, although, as we discuss in Chapter 5, it may not be doing enough to invite more voices critical of the DfT's standard approaches to participate.

Establishing an independent research body for transport would further complicate the institutional landscape. In our view, there is a stronger case for simplification of institutions rather than greater complexity. Where there are opportunities for this, such as with upcoming rail reform, government may wish to assess whether institutional roles could be clarified and simplified. But this needs to be accompanied by greater scrutiny of evidence.

The lack of a national strategy, and scrutiny of investment and policy, limits the role of parliament. England is the only country examined that does not have a national transport strategy or overall investment plan, where evidence would be required to be debated in parliament and scrutinised. This is in contrast to the approach of somewhere such as the Netherlands, where regularly updated investment plans are debated in parliament. While this is not always a guarantee of good evidence use, the UK's own national policy statements are increasingly dated and out of line with government ambitions on climate change, air pollution and 'levelling up'.[25] To bring the UK up to the levels of our comparator countries, the DfT should support the National Infrastructure Strategy with co-ordinated investment plans by updating National Policy Statements and considering **a new strategy covering differing modes of transport**.

The National Audit Office's current approach and its focus on value for money is useful but primarily looks at certain kinds of evidence. This lack of scrutiny compounds the risks we outline above around both the perceived and actual independence of the evidence produced to support policy. To supplement this, there needs to be a greater focus on scrutiny of evidence from parliament. In particular, the Transport Select Committee should **carry out regular 'evidence checks'**[26] on the evidence that the DfT uses for key policies. It has done this recently with work on young and novice drivers and should broaden this out to other departmental policies.

3. The analysis of evidence

For evidence to be useful for policy and decision making it must be effectively commissioned and analysed. The processes that institutions put in place to do this work are a core part of whether evidence is used effectively. Commissioning needs to be correct, while analysis must assess not only the impact of policies but also the trade-offs inherent in making decisions.

In this chapter we look at the underlying methods used by the government, the effectiveness of scrutiny and the use of evaluation.

The Treasury sets out an idealised 'ROAMEF'* method in its Green Book guidance on analysis. While that is useful in structuring the approach to producing business cases in government, the reality is rarely as linear or simple. As the Institute for Government noted in *Policy making in the real world*, policy makers "often know what they should be doing, but experience difficulties putting it into practice".[1]

The UK's approach to analysing evidence

The UK has one of the most comprehensive and durable approaches of any country in the world to assessing the impact of transport policies and investments. However, the processes applied are highly technical, which means that they are inaccessible to non-specialists. A lack of transparency for evidence underlying decisions and evaluation that is inconsistently carried out also means that the analysis underlying decisions is not always trusted by external stakeholders.

Transport appraisal – the heart of evidence and analysis

The UK's approach to appraising transport policies and investments has been consistent and long-lasting. There have been 32 ministers or secretaries of state for transport since Barbara Castle in the mid-1960s, but many of the principles for assessing transport investment and policy decisions are the same as under her leadership.

The transport business case method, adopted in 2010, is the most recent statement of the department's approach to decisions.[2] It is in line with the Treasury's Green Book "five case model"** for decision making in government, which sets out the evidence required at each stage of development of a policy or project and what these forms of evidence may be.

* The 'Rationale, objectives, appraisal, monitoring, evaluation, feedback' cycle, as defined in the Green Book.
** Consisting of a strategic, economic, financial, commercial and management case.

The way evidence is presented is through the DfT transport analysis guidance (TAG) and its Scottish and Welsh equivalents, STAG and WelTAG. These set out how to undertake modelling and appraisal for most transport policy interventions or infrastructure decisions, including key parameters, standard data and approaches to take. While they are badged as guidance, they operate more like an overarching modelling and appraisal system.

As we discussed in Chapter 3, the centralisation of this system gives the DfT significant control over evidence and appraisal. As a former political adviser told us: "Unlike some systems that can be said to have started out with democratic aims and then been institutionally captured, our transport appraisal system started out within institutional control and has from the start been designed so that institutions could to a large degree control it."[3] This system is also not without wider criticism, the Transport Planning Society recently argued that the appraisal system requires fundamental reform,[4] a view echoed by some of our interviewees. We discuss some of the strengths and issues with the system below.

A consistent system for evidence analysis

The UK's approach has provided the basis for other transport appraisal systems,[5] and interviewees in both the UK and internationally spoke of the strengths of having a consistent overall method. While the approach has remained the same, new evidence has been incorporated within it over time, including on environmental and health impacts.

This was possible because policy makers have been allowed the space to think strategically about transport evidence, as the DfT became less involved in individual road and rail schemes with the creation of arm's length bodies for strategic road and rail delivery. Academics involved over several decades of DfT thinking said the department had engaged in an "evolutionary process" in its use of evidence as it had become less involved in delivery.

Decision makers put a lot of weight on the headline benefit cost ratio

Assessments of transport policies and infrastructure are supposed to present evidence across the five cases – strategic, economic, commercial, financial and management. In practice, much more attention is paid by decision makers to the economic case than the others, and in particular to the benefit cost ratio (BCR), a key aspect of value for money.

Interviewees consistently noted that this headline number could dominate thinking, as opposed to the appraisal summary table, which tries to summarise a wider range of monetised and non-monetised impacts but is often buried deep in an appendix to the business case. As the former chief executive of the Campaign for Better Transport noted: "While there's a five-case business case model, everyone jumps to the economic case and BCR."[6]

Value for money guidance acts to remove the most poorly performing schemes

One of the reasons that people jump to the economic case is the way that the DfT assesses value for money (VfM). A performance indicator for the DfT is the amount of project spend at a greater than 2:1 BCR (that is, delivering at least £2 of benefit for every pound spent, or 'high' value for money).[7] This weighs heavily in the minds of decision makers, as it is perceived that it is less common for projects under this level to be approved.* One former insider told us that projects under this value always had an extra level of consideration, that of how they would justify the spend to the NAO.

As this requirement also applies to funds devolved to other agencies or tiers of government it can lead to misleading practices outside central government, with a private sector interviewee saying: "Consultancy colleagues will freely admit and have said 'well basically we say to our clients, you tell us the BCR numbers you want and we'll go away and find a way of producing it'."[8]

But even this sort of ethically questionable approach only applies when schemes are just under the 'high' value for money threshold. No amount of fudged assumptions would be likely to turn a scheme with a very low BCR into one with a high one.

In practice, guidance on achieving at least a 2:1 BCR typically functions more as a convenient barrier to stop the very worst performing schemes from obtaining funding. Exceptions to this include those projects that have the biggest political priority – the Garden Bridge had a BCR of between -2.4 and 5.8 (a negative value meaning that the costs outweighed the benefits), with officials most confident in one of -0.9.[9] The guidance is also used as a filtering device at local levels, as authorities know that central government rarely accepts schemes below this level. They are heavily disincentivised from promoting schemes where this threshold is not met, given the constraints on their budgets.

A focus on achieving the 2:1 BCR or 'high' VfM is also driven by the government's own assurance processes. The national local growth assurance framework governs the spending of mayoral combined authorities (MCAs) and local enterprise partnerships (LEPs) and says that BCR "should not be the sole driver of decision-making". However, it then notes that "[w]e would like to ensure that the value for money of major transport investment is maintained and therefore would expect that MCAs and LEPs would only in exceptional circumstances agree to fund schemes with lower than 'high' value for money".[10]

This has consequences. Scheme promoters, independent assurers and politicians feel driven to ensure that approved schemes pass the 2:1 ratio, searching out more speculative benefits. Some projects are also re-categorised as economic development or regeneration schemes rather than transport, as they're perceived as having easier paths (based on land value or job creation) to approval for marginal schemes.

* It is not possible to assess the truth of this, as the DfT does not routinely publish the value for money of all funded projects, let alone unfunded schemes, as we discuss elsewhere in this section.

Alternative approaches are sometimes used* and we conducted the majority of our interviews before publication of the 2020 Green Book Review,[11] which emphasises a greater focus on the strategic case for interventions rather than simply the BCR. It is too early to tell whether the changes to the Green Book will reduce the weight decision makers place on the headline BCR, but as we discuss below, the current focus may also skew the selection of schemes for investment.

A singular focus on BCR advantages schemes that save time and not those that reduce road capacity

In transport, the 'benefits' and 'costs' included in the BCR consist of a number of elements. Some of them are what we could consider classically 'economic' – that is, relating to reduced costs borne by businesses or experienced by consumers (for example, a change in the price of a journey). But it also includes a quantitative estimate of other impacts on society, including things like greenhouse gas emissions, the health impacts of pollutants or the health benefits of walking and cycling more. The quantitative value placed on these is based on extensive research to understand their approximate market values.

While the BCRs calculated are comprehensive, with this sort of appraisal, the focus on this single number can hide more than it illuminates and is poorly suited for some kinds of project. The key example for this is in the treatment of travel time savings. This is the area where many schemes generate most of their benefits (or disbenefits). Setting aside the spirited academic debate about whether these time savings actually exist in the long run,[12] their size relative to other costs and benefits can distort the appearance of a scheme's value for money.

Schemes that restrict traffic significantly will often have very poor appraisal scores, even if they may be very desirable for other reasons like public health, carbon emissions or air quality. For example, one of Transport for London's 'cycle superhighways', CS2X, was estimated to create journey time disbenefits £25m greater than the total of its benefits over its project life.[13] In most cases, such a project would have failed to get central government funding, as its BCR was below 0 (let alone below 2). However, TfL was able to disregard this, simply noting that "TfL's business case analysis tools are not generally well set up to quantify the benefits of cycling projects".

Conversely, schemes can use this weighting to their advantage under certain conditions. For maintenance schemes where promoters can argue that if there were no investment a particular road or structure would close to traffic, investment can appear one of the best possible uses of government money in the country. Here, it is possible to generate BCRs of more than 100.[14]

The problems with a complex system

Using a system like TAG means that objective evidence and analysis are fundamentally embedded in the core of policy making and project appraisal. But the downside is that analysis can be complex, conservative and inflexible.

* Such as a multi-criteria analysis for the National Infrastructure Commission's *Rail Needs Assessment for the Midlands and the North*, December 2020, https://nic.org.uk/app/uploads/RNA-Final-Report-15122020.pdf

The TAG system is comprehensive, but therefore also lengthy – it is 1,042 pages long, with more than 30 accompanying spreadsheets and five accompanying computer programs. This means that outsiders find it impossible to pick apart what has occurred if they suspect that evidence has not been properly assessed. For example, it is sometimes argued that housing is not considered in transport analysis – the reality is considered as part of one sub-unit of the guidance.[15]

This is made worse by the system's inaccessibility for non-specialists. It was described to us by Transport for the North's head of economics as one "so few people understand ... having TAG as the starting point for every conversation limits the ability for other people to engage".[16] While there have been attempts to make business cases more understandable (described by the DfT as a "people-centred business case"), these have never been published and it is unclear if, three years on from their announcement, one has ever been written.

Transport analysis often requires forecasts far into the future to understand the long-term impact of infrastructure projects and policies. Projects are typically appraised for their costs and benefits over the 60 years that follow their completion, meaning that the first section of the M1, completed in 1959, has only just reached the end of this period.*

With such time horizons, decisions makers need to understand the likelihood that reality will diverge from forecasts, and in what ways this might happen; this is typically termed 'uncertainty'. Uncertainty is a key aspect of the DfT's current research programme as part of annual appraisal and modelling strategy route map.[17]

Decision making too often concentrates on a narrow range of scenarios

To try to address issues with uncertainty, the DfT has moved to using seven potential scenarios in its most recent set of road traffic forecasts[18] (produced before Covid-19 and transport decarbonisation commitments). These now capture a broader set of possible futures, with traffic volumes predicted to grow by between 17% and 51% by 2050; no one scenario is considered more likely than any other.

But these scenarios are not reflected in how schemes and policies are commonly presented within the DfT or local areas. Instead, a single central core (or reference) case is typically used, which provides a BCR value on which to base value for money assessments.** This is, in part, due to capacity and workload constraints. Given the amount of effort and time required to produce a single value, repeating the exercise seven times would make the timescales needed to assess transport projects infeasible. But it is also due to concern about what benefit the likely decision maker would get from being presented with such potentially divergent scenarios. Interviewees inside the department spoke of the difficulties of communicating "uncertainty without overload" and maintaining credibility for these forecasts.

* There has recently been a consultation on whether this should be extended further, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/941231/appraisal-periods-consultation.pdf

** This is often accompanied by high and low sensitivity tests, which are not in themselves any of the scenarios in the road traffic forecasts.

There are also legal reasons why uncertainty is a difficult topic to discuss openly. Investment decisions are subject to judicial review or examined by planning inspectors through the nationally significant infrastructure project process. Expressing uncertainty (while it may be technically justified) could result in a risk to projects' progress. Here, there is a strong preference to use a simple central case reliant on Office for Budget Responsibility forecasts. If instead multiple scenarios were presented, the overall need for projects could more easily be questioned, since most projects would have at least one potential future where they would not be required.

But there are examples of communicating uncertainty effectively in the UK, such as Transport for the North's *Future Travel Scenarios*.[19] This work, building on the Government Office for Science's (GO-Science's) futures and foresight toolkit, used demand modelling to create four plausible scenarios for travel in the north of England by 2050 and transformed complicated parameters into understandable 'stories' for decision makers.

While the DfT has committed to producing an 'uncertainty toolkit' that will provide guidance on how its scenarios should be used by analysts, it is equally important that decision makers understand the implications of this uncertainty. This does not just extend to officials, but others within the transport system, including politicians and planning inspectors. It is almost wilfully naïve to insist that there is only one potential future for travel, but many of our current processes seem set up to insist this is the case.

Transport models are important but their limits are not well understood

The modelling of transport systems is central to the production of economic evidence. The DfT alone has 118 'business critical models' covering everything from the national transport model system to Coastguard simulation and accident analysis.[20] These models simulate current and future conditions in transport networks and help policy makers understand the impact of potential policy changes or investment. They provide the underlying data for most transport policies and decisions, including transport economic analysis.

A modelling specialist told us: "All models are necessarily simplifications, but a well-designed and applied simplification is more helpful and achievable than an over-complex one."[21] But these types of model are contested as a means of assessing evidence to support decisions. Transport models, particularly those that try to simulate traffic, have regularly caused controversy among politicians, practitioners and academics.

Our interviewees highlighted a number of key issues, which we set out below.

Limitations and assumptions can be poorly understood by decision makers and there can be perverse incentives

Understanding which models are helpful is obscured by their complexity and the detail of their underpinning assumptions. Modelling systems like SATURN* have been under development for decades and have a wide array of parameters that can be used, some of which might dramatically alter a modelling result. Knowing which are appropriate for particular situations requires years of experience. Like transport appraisal more widely, modelling is complicated and knowledge of its workings is limited, with the field of transport modellers a few thousand strong at most. The majority are also based in the private sector rather than central or local government. This leads to a lack of capability and what a private sector interviewee described as "pretty woeful" decision maker knowledge of the limitations of modelling, particularly in local government.[22]

This is complicated by perverse incentives caused by a bidding culture in local government. Traffic models are frequently commissioned for specific projects, after funding has already been provisionally allocated by the DfT or a clear political preference made. As one modeller notes: "[Politicians] will naturally see the model as a tool to get a specific decision made, and often there is already political capital invested in the outcome."[23] They are not incentivised to critically assess the limits of the model or its underlying assumptions as they view it as a tool to access funding.

Different solutions have been proposed to address this, including the creation of an independent commissioning body for transport models[24] or a network of models run centrally. But a simpler approach would be if local and regional government had greater long-term certainty of funding or were more easily able to switch funding between projects. This would incentivise them to invest in models, analysis and evidence for the longer term.

Modelling scrutiny is too constrained by commercial sensitivities and capabilities

Transport models are also not typically open to external scrutiny. Almost all forms of transport model used in the UK are proprietary, based on intellectual property developed in academia or consultancy and not available to the general public without paying licence fees and obtaining the underlying data. Often the underlying data that powers the model will also be subject to separate restrictions and limits on release. This, along with computational difficulties (transport models can take several days to run and analyse and air quality models can take weeks) further limits attempts to open up. Visions of 'armchair auditors' unpicking transport models are unrealistic: not only is there a lack of access, but the specialist skills and knowledge are not widely available. There are steps to change this with new models – the propensity to cycle tool, used in cycle infrastructure planning, has its source code openly available on GitHub, a code repository.[25]

* The most commonly used strategic highway model type in the UK, originally developed in the 1980s

But if external scrutiny is difficult to achieve, it means there is a greater need for internal assurance. While the DfT has significantly improved its internal assurance after the West Coast rail franchise collapse in 2012, publishing its analytical assurance framework[26] and increasing capacity, including undertaking external peer reviews, this is not always the case in local government. Due to the limits on technical capacity and capability (as we discuss in Chapter 5) they are more often reliant on the internal quality assurance processes that their private sector modelling consultants provide and are not always able to effectively scrutinise the evidence on which they themselves rely.

This means that modelling evidence in local government is treated too often by decision makers as the complete truth, whereas the reality is more like the economists Mervyn King and John Kay's argument: "Models are tools like those in the van of the professional plumber, which can be helpful in one context and irrelevant in others."[27] Gaps in capability and resourcing are preventing models from always being used critically and effectively to support transport decisions.

Political vision and decision making don't always align with objective transport appraisal

The idea of strongly evidence-based policy can sit uneasily alongside the notion of political visions for the transport system, whether that is based on trying to boost economic growth through expanding highways (which led to 'Roads for prosperity' in the 1980s) or for particular projects (such as HS2). Political commitments can also be made in the early stages of a project, when evidence is not in place to assess costs or benefits. One of our interviewees characterised transport as historically following a "predict and provide political approach", where political decisions and nominally objective forecast-led processes could interact messily.

This happened with the case of the replacement of outdated Pacer trains in the north of England. When renewing the Northern rail franchise in 2014, there had been a political commitment to withdraw the vehicles by 2020 and provide new rolling stock. Given that the vehicles were fully depreciated and very cheap to run, there was no way to produce a BCR that showed that replacing them was good value for money. After significant back and forth within the DfT, ultimately a ministerial direction – that is, a formal instruction to proceed with a spending proposal despite the objection of the permanent secretary – was required to issue the invitation to tender. This was because it had a BCR of 0.35, meaning it was expected to achieve only 35p of benefits for every pound spent[28] and was consequently poor value for money. The political justification for this was that the use of Pacer trains did not align with the "vision for economic growth and prosperity in the north"[29] and that it would help to meet a future shortfall in the availability of diesel trains.

This was an unusually transparent example, largely because of the existence of a ministerial direction. As we outline below, these political elements in decision making and analysis are normally much less clear and rarely explained. The reasoning behind decisions is rarely published, nor are the alternative options and their accompanying costs and benefits.

Box 1 **A303 under Stonehenge**

Planned improvements to the A303 at Stonehenge in Wiltshire have been particularly controversial and long in gestation. Initial routes began being considered almost 30 years ago and the project has been cancelled by both Conservative and Labour governments due to cost increases. The current preferred solution is for a 2.9km bored tunnel, which was given development consent in November 2020. Other road widening along the route would also ease congestion in the short term for road users.

Following cost increases on the preferred route there were standard transport benefits of only 31p for every £1 spent, leaving it as 'poor' value for money and not a project that the DfT or Highways England would typically fund.

To address this, Highways England applied innovative 'stated preference' techniques to assess how people would value the improved landscape. This added another £955m to the total benefits of the scheme – representing 73% of the total benefits and moving it to a BCR of 1.1 or 'low' value for money. DfT advised decision makers to treat these figures with caution.

This shows the flexibility of evidence processes – substantial changes were made to use newly collected evidence and update the analysis. But this came after a quarter of a century of the project being a continued political priority, despite limited justification in traditional transport evidence.

Lack of transparency in transport decisions reduces trust

Assessing the use of evidence in transport decision making is made significantly harder by the obscurity of the weight that different forms of evidence have been given. The exception is where decisions are made under quasi-judicial processes, where they are required to note the weight given to different forms of evidence.

Not publishing information leads to more criticism

The government rarely publishes the full business cases for projects or policies. This makes it more difficult to assess the validity of many of the common criticisms of the transport appraisal system. A recent review assessing whether there were regional differences in the threshold BCRs at which transport projects were approved used data from schemes more than 15 years old, meaning it was unable to reach any definitive conclusions on recent practice.[30] The information relating to schemes is available under Freedom of Information or environmental information regulation laws and not publishing it simply opens the government up to criticism.

A fear that people would focus only on the single value of the BCR may be part of the reason that there is a reluctance to publish this information. This is understandable, given the issues outlined elsewhere in this section. However, publishing the entirety of the strategic and economic cases would allow projects to be viewed with their full strategic justification. This is particularly important given the recent Green Book Review emphasis on the importance of the entirety of the strategic case.

The rationale for why different forms of analysis have more or less weight in decision making is unclear

While economic appraisal and transport modelling are at the heart of the DfT's use of evidence, there are other teams within the DfT with specific responsibilities for analysis. These include the central science, social research and analysis teams (amounting to 30 FTE staff), who all report to the deputy chief scientific adviser. There is also a Science Advisory Council, which includes members with expertise in transport engineering and behavioural science.

Formally, these teams provide input into the policy development process and overall decision making. But it is not clear that their input carries the same weight as the economic analysis and advice.

Interviewees with experience of central government, including a former chief scientific adviser, told us they felt that non-economic evidence could be left out of decision making processes. "If [evidence] didn't meet the economists' threshold of materiality then there was no point having a discussion about it,"[31] they said, although it is not always clear what this threshold is. Other forms of advice, including science advice, can follow a 'parallel track' to the economic advice, limiting its impact. But there are no available records of the weight different forms of evidence have when most decisions are made, although we repeatedly heard anecdotally that evidence outside the BCR was given less weight.

There has been progress on making transport data increasingly open

The DfT has opened up more of its data and methods through its recent appraisal and modelling strategy, building on its strong foundations of the use of evidence and data. In a 2018 Sense about Science review of evidence transparency for policy, the DfT scored well compared to other departments,[32] and the work of its Developing Data Unit, launched in 2019, has further improved the quality and scrutiny of evidence.

The DfT's attitude to open data extends to elements like organisational charts, which are updated and published regularly, in contrast to most Whitehall departments, but some elements remain closed to external scrutiny, including executive committee and board minutes.[33]

Other pieces of transport evidence remain closed off. Estimates of how the number of people using rail services will change after various forms of investment are contained within the Passenger Demand Forecasting Handbook, which summarises decades of research on rail demand. These estimates are key to understanding the impacts of changes to the rail network, but commercial confidentiality means that it is accessible

only to the members of the Passenger Demand Forecasting Council (train operating companies, public sector bodies and consultancies).[34] Planned changes to franchising that may remove these limits mean that the DfT should seize the opportunity to put rail evidence on the same footing as that for other modes of transport and fully into the public domain.

Evaluation is fragmented and inconsistent

Evaluation is a "systematic assessment of the design, implementation and outcome of an intervention",[35] whether of an individual policy or infrastructure. It is in principle a core part of the policy process, to ensure that evidence from past delivery is built into future policy. As the DfT's deputy chief scientific adviser told us, this principle is "something no one ever disagrees with".[36] But it is difficult to evaluate projects and policies in practice, with the Institute for Government previously examining the poor use of evaluation in six large pieces of infrastructure.[37]

One reason for this is that transport policy and infrastructure have widespread impacts on many areas of the economy, but these are often gradual and hard to detect. In particular, it is difficult to establish a counterfactual about what would have happened if the investment or policy had not gone ahead. When the What Works Centre for Local Economic Growth – part of the What Works Network of specialist centres dedicated to improving evidence in decision making – examined more than 2,300 transport evaluation studies from OECD countries, only 29 met its minimum standards. One key reason for this was the lack of a robust counterfactual – for example, a comparison area where there was no investment.[38]

While the DfT has an Evaluation Centre of Excellence, the 'best in class' in UK transport evaluation is undertaken by Highways England. Their post-opening project evaluation (POPE)[39] system is used on major interventions on the strategic road network and uses national data to construct counterfactuals. This system has garnered international recognition for being particularly robust and widely used, with interviewees in governments outside the UK praising it as the sort of model they would like their countries to move towards. But evaluation this robust is not common throughout the UK transport system. This is particularly true in local government, where the on-off nature of spending, variable skills and the fact that funds only last as long as the project disincentivises local areas to evaluate. When assessing local bids, past project delivery is taken into account[40] but not whether the area has undertaken robust evaluations.

The DfT's own focus on evaluation has varied. There have been attempts to embed it within the departmental culture, but there has not always been ministerial interest. Some areas of policy are also more effectively evaluated than others: a consistent focus over the past decade in evaluating the impact of cycling and walking interventions has dramatically improved the evidence base, but this has not been the case for buses. Some schemes like the Transforming Cities Fund or clean air zones have relatively robust evaluations planned, but this was not true for local growth fund transport projects. It is also not always clear that there are routes back into analytical guidance for transport evaluations, given concerns about how they can be generalised.

Proper evaluation is not consistently applied to UK transport projects and policies for several reasons:

- **There is limited political interest in evaluation.** It can be a technical field with lengthy delays in order to understand real world impact. Projects are supposed to be assessed one and five years after opening. Given how long transport projects take to develop, that is often long after ministers and other leaders who initiated the projects have left their posts.

- Interest tends to peak between when decisions to progress schemes or policies are made and when a scheme is built or policy implemented. As we were told: "The way the industry operates means that everything is about making the case for something. **There is just no incentive for anybody to invest in evaluation**."[41]

- **Resources are limited.** The DfT has a relatively small team of specialist evaluators and there is almost no capacity or expertise in local or regional government to undertake comprehensive evaluation. In local areas the DfT disburses capital grants that must be spent by the end of an accounting period, but evaluation can occur up to five years later and consumes limited local revenue resources.

- Finally, there is **limited external scrutiny** outside the DfT to drive evaluation forward. The DfT was stung into action by a critical NAO report on evaluation in 2011[42] but there is less current scrutiny. For example, the DfT's monitoring and evaluation programme has not been updated since 2017, without apparent comment.

Research priorities are not always clear

Potential evidence needs and research requirements from policy areas are reviewed annually, scrutinised by the chief analyst and chief scientific adviser and published. While this leads to an extremely comprehensive list, developed through a "laborious" process, it is unclear how previous areas of research interest have been met or how research outputs have been fed into decision making.

The DfT's list of areas of research interest is among the longest in Whitehall and does not provide sufficient focus for the DfT to effectively expand its evidence base or for external researchers to understand the DfT's priorities. There are 150 specific research requirements identified, some as broad as "Environmental performance – understand the real-world emissions of road vehicles". While the DfT is currently developing its inaugural science plan to better join up in-house and commissioned research, this current lack of focus may hinder the DfT from distinguishing between those research needs that are key to providing better evidence and those that are simply 'nice to have'.

Overseas comparators

Table 1 **Transport infrastructure investment processes in comparator countries**

Country	UK	Sweden	Germany	Netherlands	New Zealand
Name	Transport analysis guidance (TAG)/STAG/ WelTAG	Samlad effektbedömning (SEB)/ASEK	Economic appraisal method for the FTIP/EWS/ Standardisierte Bewertung	OEI	Monetised Benefits and Costs Manual (MBCM)/ investment assessment framework
Key metrics	BCR/net present value (NPV)	BCR	BCR, MCA scores	BCR/NPV	Results alignment, CBA
Appraisal period (years)	60	40-60	Varies	Varies	60
Non-monetised elements included?	In appraisal summary table	Part of SEB assessment	In standard table	In standard table	In standard table
Used at national level?	Yes	Yes – projects with federal funding	Yes – projects with federal funding	Yes	Yes – projects with federal funding
Used at local level?	Mandatory for almost all projects	Infrequently	Discretionary	Discretionary	Use of MBCM is mandatory for local projects that require central government funding

Other forms of analysis try to weigh broader impacts

Most of our comparator countries pursue a multi-criteria analysis* approach alongside that of cost benefit analysis (CBA) to provide decision makers with an understanding of the non-economic impacts of individual projects. One of the key examples of this is Sweden's Samlad effektbedömning (SEB) process used within Trafikverket, to appraise infrastructure investment. This weighs different forms of evidence and presents an overall score for a project, including significant weight for the CBA. Similar processes are used in Germany and the Netherlands.

In each country, quantitative evidence (or that which can be quantified) was perceived as particularly important – with interviewees telling us that the Netherlands "is very much fond of numbers, maybe more than any other country in the world" and others emphasising that political decision makers were particularly keen to see any evidence quantified. In this way, there are broad similarities with the level of and keenness for quantification in the UK.

* One that provides assessment of the impact of a project across multiple domains like environmental, economic or social impacts.

The link between CBA and project selection is poor

Empirical research in Sweden,[43] the Netherlands[44] and Germany[45] demonstrates that there is a weak correlation between actual investment and CBA or multi-criteria analysis scores. CBA is not necessarily the main reason projects progress, being mostly used to exclude very weak projects, such as in Germany, where only projects with a positive economic value can progress through to implementation.[46]

In Sweden and the Netherlands, this weak correlation can be partly explained by wider political goals. In Sweden, there is an increasing focus on an overall vision for transport and projects can be evaluated against how they deliver against this political vision, rather than how they score with traditional evidence criteria. This led to a tension inside the Swedish civil service, where we were told that "the Green Party vision for high speed rail [with very poor BCRs] sends the signal through the department that you don't care about such things",[47] and that certain kinds of evidence are considered less important than others when it comes to decision making, even if the process nominally ranks them equally.

Interviewees in the Netherlands explained how parliamentary policy makers "shop at CBA" for specific aspects that support their political goals. Examples included Green politicians prioritising the ecological impacts and carbon emissions aspects of a CBA, like particular policies aimed at stimulating the purchase of electric vehicles passing despite having a very low cost efficiency. Yet this was largely seen as "not a problem" by interviewees, since CBA sets out the benefits and costs of a decision, but politicians should "process it as policy information not a decision tool".

In Germany, the use of CBA is also seen through the lens of the political negotiation between federal and other actors, particularly states. Projects go through CBA, environmental appraisal, spatial and urban planning analysis[48] and are then ranked by the BMVI within their mode (road or rail). This is then subject to negotiation and re-ranking, with states receiving a certain level of budget for projects sometimes "independent of real necessity".[49] This also has an effect on the types of projects prioritised. Past infrastructure plans often had a significant number of local bypasses in the top ranking, as these were very popular with state actors even if they did not meet wider federal objectives.

Cost benefit analysis and evidence are used less frequently at lower levels of government

In our comparator countries, it was less common for local and regional government to use national appraisal standards for their own projects as they had greater local funding. While the largest projects needed some degree of federal funding, and therefore were required to use the national economic appraisal methods, many were smaller and could be developed with local funds. In contrast, local government in the UK (and particularly England) is far more reliant on competition and bid-based funding to the DfT or other bodies, which require that transport analysis guidance or equivalent is used. This means that local government often has little discretion over the evidence it collects and uses.

Interviewees said that this freedom meant that elements of both good and poor use of evidence emerged. In Sweden it allowed local areas to assess benefits more widely than just on transport impact alone, so they had greater freedom to pursue projects that were also about urban regeneration or the environment. However, more decisions were also made on 'gut feeling', with attendant potential biases and difficulties in unpicking why exactly decisions were made.

It also allows areas to pursue policies they would not have been able to under national systems. An interviewee highlighted that Freiburg in Germany was able to develop its successful cycling infrastructure as it could access funding without needing to engage with federal infrastructure assessment processes that leaned towards road investment.

Prioritising wellbeing in New Zealand has successfully changed the focus of policy making and the types of evidence considered

The most significant challenge to a standard CBA approach for transport in any of our comparator countries is in New Zealand. A shift to prioritise wellbeing* across policy making in New Zealand has changed the processes and evidence required for transport projects. The 2019 'Wellbeing budget' was designed to move policies away from a dominant focus on economic growth, setting out wellbeing priorities that ministries were instructed to pursue.[50] This has led to the creation of two complementary frameworks that govern transport decisions:

- **Living standards framework** – owned by the Treasury, it was developed to assess the impact of policy options and identify key areas that are important for wellbeing across all sectors.

- **Transport outcomes framework** – owned by the Ministry of Transport, it provides a set of outcomes that the transport sector can aim for to improve wellbeing and liveability.

These sit alongside a broader government economic evaluation manual, which is a much more standard cost benefit approach. Projects are increasingly required to assess their impacts with both the economic evaluation manual approach and that of the transport outcomes framework. Only where projects have acceptable impacts with both will they be allowed to go forward.

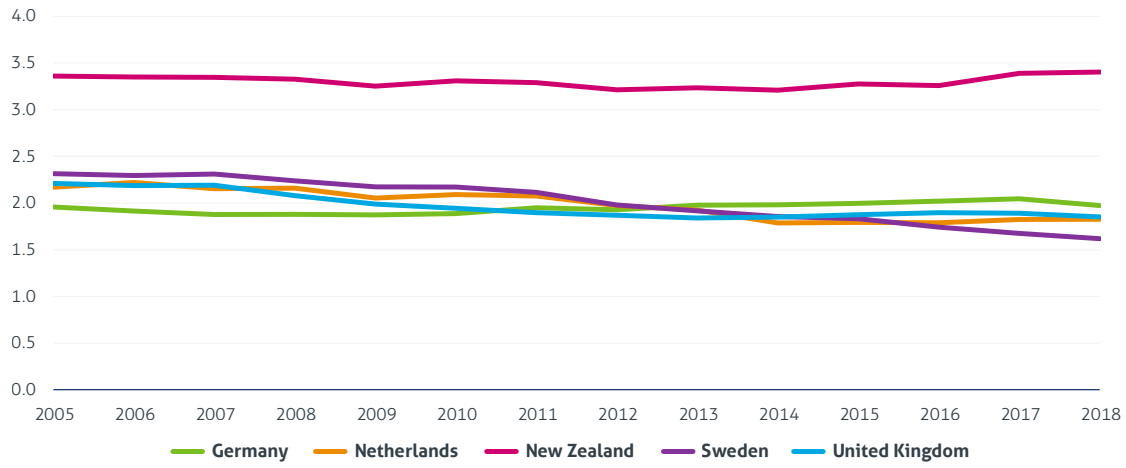
The New Zealand Treasury has been key in making the move to a wellbeing focus successful since it leads on the living standards framework and its accompanying dashboard.[51] This ownership means that it does not act as a block to qualitative evidence. When the Ministry of Transport seeks additional funding, it has to follow this framework, further embedding wellbeing evidence within the policy making process.

* The New Zealand Treasury defines wellbeing as "when people are able to lead fulfilling lives with purpose, balance and meaning to them. Giving more New Zealanders capabilities to enjoy good wellbeing requires tackling the long-term challenges we face as a country, like the mental health crisis, child poverty and domestic violence. It means improving the state of our environment, the strength of our communities and the performance of our economy." (The Wellbeing Budget, New Zealand Treasury, May 2019, www.treasury.govt.nz/sites/default/files/2019-05/b19-wellbeing-budget.pdf)

A ministry insider explained that the Treasury pushes departments to demonstrate the 'national benefit' and to have the data to support this, which in turn is "driving innovation and raising interest about what they could do".

These policies are still under development and change, with the chief scientific adviser explaining that the ministry is discussing bringing in a cultural impact assessment and officials "have acknowledged that climate change needs to be a bigger focus" in particular. This prioritisation may be necessary – owing to its car dependency, with one of the highest rates of car ownership in the OECD, New Zealand has the highest production of greenhouse gas emissions from transport per capita in any of our comparator countries.

Figure 7 **Greenhouse gas emissions from transport of comparator countries (in tonnes of CO_2 equivalent per capita)**



Source: Institute for Government analysis of OECD statistics (2019).

Different approaches to uncertainty

Politicians find it hard to consider 'uncertainty' in transport policy

Scenario-based approaches are common in central ministries in Germany and the Netherlands when trying to understand the future impacts of transport policies or infrastructure. They help describe uncertainty by expressing different future scenarios based on changing key variables in transport appraisal or setting out broad qualitative visions to discuss.

Analysts we interviewed think that these approaches help communicate the uncertainty inherent in transport better than providing a single scenario, although decision makers sometimes push back. Interviewees told us that politicians "hate uncertainty and would prefer one scenario" with a single CBA score. Similarly, in Sweden, the appetite for considering uncertainty has been driven far more by analysts than decision makers. Decision makers felt that considering uncertainty made schemes more difficult to 'sell' to the public, particularly if benefits were felt to be uncertain. There can be an uneasy tension between what analysts feel is their professional responsibility to report uncertainty and political decision makers who have to convince sceptical outsiders of the value of a project or policy.

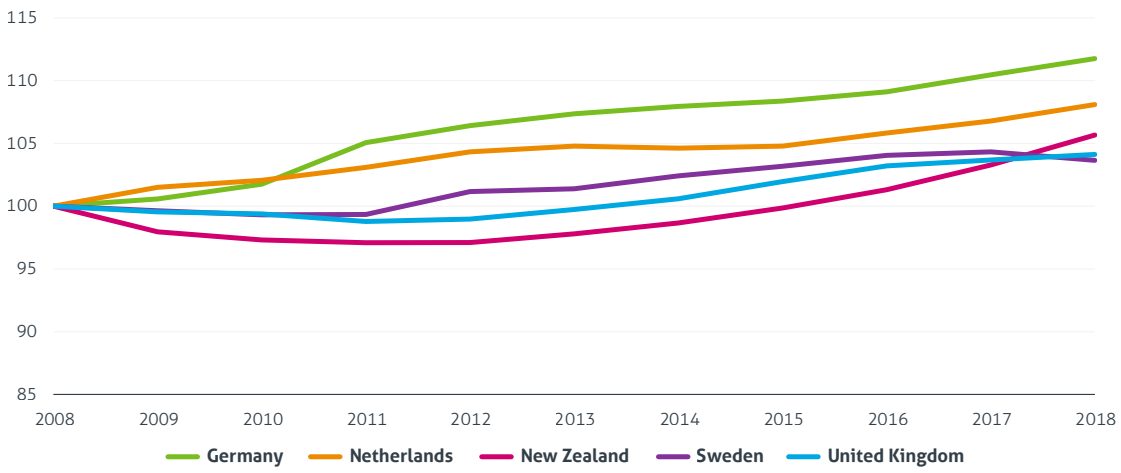
New approaches to uncertainty mean changes for traditional analysis

Two of our comparator countries have established new approaches to uncertainty that have become embedded within decision making. In the Netherlands, PBL has undertaken qualitative scenario-based work,[52] but the most significant change in approach was in New Zealand with the 'future demand'* set of projects. These quantified the transport impacts of four potential future scenarios for travel and also examined a 'real options'[53,**] approach to transport investment.

They were a response to new evidence that showed that levels of growth in transport demand between 2005 and 2013 were far lower than at any time since 1980. Interviewees inside and outside the ministry were keen to emphasise how it had changed their approach to cost benefit analysis and to the sorts of infrastructure proposals they bring forward. A ministry employee said: "We need to get away from [the precision of a BCR of] 5.3 as absolutely accurate. The current environment shows how uncertain the world is."[54] This work was pushed by officials, out of a sense of 'professional stewardship', rather than from ministers, reflecting the challenges for politicians and uncertainty we note above.

The change in approach was reflected in the infrastructure decisions made as part of the New Zealand government's most recent land transport policy statement. This prioritises infrastructure options that are more flexible and more easily expanded or contracted, even when they do not score the highest in the 'central' case. This approach aims to reduce car and road dependency and counter recent trends in increased private car ownership, but will need the full co-operation of Waka Kotahi, the New Zealand Transport Agency. Strategies can be difficult to turn into actions – Waka Kotahi is currently facing a legal challenge for allegedly not meeting the obligations concerning climate action in the government's 2018 policy statement and failing to change its focus on road transport.[55]

Figure 8 **Passenger car ownership (per 1,000 inhabitants, indexed 2008: 100)**



Source: Institute for Government analysis of OECD Performance Indicators, 2008–2018.

* A project led by the Ministry of Transport to model and assess the uncertainty of future personal demand for travel.

** An approach seeking to build financial options theory into transport investments. It focuses on creating and preserving flexibility within decisions to mitigate uncertainty.

Given the recent adoption of these approaches and the long lead times for transport policies and infrastructure to have an impact, it is difficult to assess whether they ultimately create different transport outcomes, but they are the most fundamentally different approach to evidence in transport policy we observed. Ultimately, a more flexible approach to investment increases the resilience of infrastructure to respond to changes in demand, at the expense of higher upfront costs.

Approaches to openness and transparency

Other countries put more evidence in the public domain

All our comparator countries had greater cultures of openness around infrastructure decision making for transport than there is in the UK. The precise approaches and degree of transparency differed between countries.

Interviewees in several countries said that even if evidence was not helpful to the case for projects, it was generally put into the public domain. This was either as part of a wider national investment or transport strategy, tabled in parliament or (in the case of Trafikverket in Sweden) published as an instruction to the civil service. This made it more explicit where decisions diverged from underlying evidence or what particular evidence had been important in decision making. While politicians 'shopped' at a CBA to pick out the parts they felt were important to take projects forward, this was at least conducted more openly in most cases.

More parliamentary scrutiny is not always a guarantee of better outcomes

This level of openness is often closely linked to parliamentary scrutiny, such as in the Netherlands, with its multi-year programme for infrastructure, spatial planning and transport (MIRT)[56] or with Sweden's investment programme. The parliamentary debate associated with these initiatives brings more evidence into the public sphere, providing insight into how it is valued and giving a platform for alternative sources of information. This enables scrutiny by parliamentary officials and increases transparency without binding MPs, allowing them to deviate from the most cost-efficient proposals if desired.

But where parliamentary scrutiny overlaps with the requirement for projects to gain parliamentary support, the impact of increased involvement on project selection and outcomes is not always clear. Projects can gain political support and resolutions in their favour in parliament, even if accompanying evidence is poor. Parliamentary endorsement then ties the hands of the ministry into providing funding.[57] Similarly, priority projects can be included before detailed analysis has been undertaken – the Göteborgspaketet project, consisting of a number of tram, rail and bus improvements, was inserted into the 2014 Swedish investment plan at a very late stage and was approved despite a subsequent poor CBA.[58]

Understanding the ultimate impact of parliamentary scrutiny on transport outcomes is also difficult. As we discuss below, poor use of evaluation can make it difficult to understand the impacts of schemes that have been built, let alone a counterfactual for those that might have been under a different process.

Policy advice and instructions are rarely published

While investment strategies are commonly published, it is less typical for central ministries to explicitly put their policy advice into the public domain. Those agencies that are assigned tasks formally, like Trafikverket in Sweden or KiM in the Netherlands, do explain their reasoning but even then, it is more common to publish final reports than underlying analysis.

The exception to this is in New Zealand, where cabinet papers and briefings are published,[59] including analysis and impact statements, although not underlying methodologies. Interviewees told us that this scrutiny helped ensure that policies appeared justified by available evidence, given the likelihood politicians may be challenged by the press or interest groups. But this openness is not a cure-all; officials need space to communicate with politicians. There is a risk that more open processes like this lead to uncomfortable evidence or opinions being passed on 'off the record' and so potentially limiting understanding of the evidence that politicians had available.

This openness about evidence in New Zealand also applies in other contexts. It is common for ministries to have the quality of their policy advice externally scrutinised every year, where they are reviewed and scored across multiple areas by the New Zealand Institute of Economic Research. This includes how well evidence is both used and explained, which interviewees inside the ministry said had pushed them to be more explicit in the evidence underpinning their policy advice.

Use of evaluation

Good evaluation is rare

Evaluation of schemes and policies is inconsistent in our comparator countries, with very few interviewees providing evidence of good practice. More noted that approaches were poor or inconsistent and some felt being more robust would be an additional burden. One interviewee inside government told us that "having to focus on five-year-old projects [would] take a lot of time". The OECD's International Transport Forum also notes that evaluation is "perceived as a weak link"[60] in transport analysis globally, with far more attention paid to the appraisal of schemes as opposed to evaluating their impacts. This can be seen with high speed rail in the UK. The cost of appraisal was millions of pounds, it generated ongoing headline news[61] and parliamentary committee inquiries[62], while an evaluation of HS1[63] around the same time received limited attention.[64]

Evaluation is seen by officials and politicians as a threat rather than an opportunity to improve policy

Reasons for poor evaluation in comparator countries varied, but we heard that policy makers in the Netherlands often viewed it less like a learning opportunity and more "like a threat", simply existing for scrutiny rather than the chance to improve. There was limited political appetite to undertake it, except for high-profile policy failures, reinforcing the belief that it could be used more for blame than learning. These tie

into possible cultural reasons for poor evaluation, such as in Sweden, where we were told "the ministry doesn't want to lift the stone too high" to discover the consequences of their projects, or in New Zealand where the "frantic" nature of the ministry impeded evaluation.

Governments say they are keen to improve, but this has not yet happened

Given that evidence for evaluation and appraisal is often very distinct, as we discuss elsewhere in Chapter 4, few officials thought that having poor ex-post evaluation necessarily meant lower levels of actual evidence use in projects and policy. But while we were repeatedly told of poor practice, every ministry employee we spoke to, regardless of country, was keen to improve, although solutions varied.

The Netherlands has instituted a new policy evaluation panel across multiple disciplines to improve practice. In New Zealand, there is due to be a new strategy to drive change, although this still commits the ministry to conduct only a small number of evaluations. Other countries focus on particular elements where they perceive weaknesses in their evidence base, such as expected versus actual costs for infrastructure projects in Sweden.

Lobbying and the role of non-governmental actors

Private negotiation between members of parliament, civil servants and lobbying groups (including industries and regional government) emerged as a key theme in comparator countries. Non-government actors can provide valuable insights and specialised evidence, but often the lobbying was not transparent, with little accountability or clarity about what informed decision making. While countries had often opened up aspects of their decision making, as we discussed above, this did not always extend to lobbying.

The private sector can exert particular influence in policy formation

In Germany and Sweden, interviewees noted the role of the automotive industries in providing evidence and influencing policy outcomes outside the formal policy making and evidence process. This can include ministers and their officials obtaining evidence directly, such as in Sweden, where we heard the government could bypass research institutions and gather evidence directly from automotive businesses like Scania and Volvo.

It can also relate to inclusion in the wider policy making processes. German institutions such as the ADAC (Allgemeiner Deutscher Automobil-Club, a group that contains nearly 25% of the population) and industrial representatives from the automotive industry have been particularly influential in the policy process, having what has been described as a "symbiotic"[65] relationship with government. We also heard of movement of key personnel between the government and lobbying groups, which deepens these links,[66] with a former federal minister of transport later serving as leader of the VDA (Verband der Automobilindustrie), an influential association of the automotive industry.

Lack of transparency around lobbying and the personal nature of some of these relationships make it difficult to assess the extent to which this has affected how evidence is considered within the German transport system. It has also changed over time. There are some indications that pro-car voices were initially influential in shaping BMVI policy away from pursuing the Energiewende* in transportation.[67] But, as well as affecting the German approach to transport policy at an EU level,[68] the 'dieselgate' scandal also "broke a lot of chains between the policymakers and the car industry".[69]

Elected politicians and regional actors push for local developments, sometimes at the expense of evidence

Specific regional outcomes are commonly pursued both by politicians elected to represent a specific constituency and by regional actors, such as local government. This is more important where parliamentary approval is required for projects and coalition governments are more common.

This is particularly prevalent in the Netherlands, where interviewees stated that rather than evidence, an effective lobby is often the "most decisive factor" in a project being accepted, adding that "if your lobby is persistent enough, it will eventually pass". Politicians frequently "lobby for a region" when it comes to large infrastructure projects rather than looking at evidence. Despite the range of research institutes in the Netherlands and the large amount of evidence generated, they can be sidelined by lobbying.

There are legitimate reasons for this lobbying to happen: politicians are elected to represent constituents and often campaign on specific transport, infrastructure or environmental promises. But this can reduce trust that decisions made by the government are backed by impartial evidence, particularly when decision making processes are opaque. It also works to devalue the role of evidence in the process and results in it being used and prioritised inconsistently, leading to further complications and difficulties when it comes to evaluating the policy.

Where regional actors are included early in the policy process, such as in Germany, they can exert more formal influence. Policy boards set up early in the policy process will typically include regional actors, partly because many powers for transport remain at the state level and states play a role in reviewing legislation in the Bundesrat.

While this should mean that local and operational evidence can be more easily included in the policy process, it can also mean that the use of the evidence is mixed with political considerations. For example, we heard that in the development of a new policy on unmanned aerial vehicles, states split sharply on whether they wanted to retain control for regulation, not so much due to evidence but to local politics.

* Germany's decades-long policy to increase renewables and phase out nuclear power and fossil fuels and undergo a clean energy transition.

Analysis and processes – a comparison of effectiveness

The previous chapter of this report demonstrated that institutional structures differ significantly between countries. However, the means and forms of analysis across our case studies show **far more similarities** than differences.

Across all our case studies, and regardless of institutional structures, analysis of transport evidence has been **grounded in cost benefit analysis (CBA)**. This means evidence is often thought of primarily in terms of economics. CBA is used as the main tool for formal decision making and it emphasises evidence that can be quantified and monetised. Many of the techniques used around the world originated in the UK and are still seen as 'world-leading' in various aspects of this approach.

However, despite all countries notionally paying close heed to CBA, there is, paradoxically, **a limited correlation** between a CBA score and whether a project or policy goes ahead. The reasons for this include political coalition-building (as with infrastructure in MIRT in the Netherlands), political commitments (like Pacer trains replacement) or transport projects that are served poorly by standard appraisal (like segregated cycling infrastructure). That this limited correlation exists is not inherently good or bad for the use of public money, there are limits to the effectiveness of CBA and areas where impacts of projects are not well incorporated. What is crucial, though, is that decisions where projects have poor CBA scores are undertaken openly, with an explicit acknowledgement of this and the other factors that have been accounted for in the decision.

We also found that decision makers across countries are normally concerned that projects meet minimum cost benefit thresholds to be seen as providing value for money. But beyond this, the relationship between a high cost benefit score and the decision to proceed is less strong. These thresholds therefore tend to be much more effective in ensuring that projects with the poorest value for money do not proceed, but less effective in supporting the good use of evidence in positive decisions to invest. They can even encourage gaming of evidence systems and transport models to artificially lift schemes above thresholds.

In most countries, publication of the costs, benefits and other impacts of particular projects is more open than in the UK, with consequent scrutiny and debate. In the UK, in contrast, it is often difficult to understand the weight given to different forms of evidence or even what the cost benefit ratios or strategic cases are for proposals or funded projects. There are important steps the UK should take to learn from the approaches of the other countries in our case studies. Particularly, we recommend the DfT should publish the strategic and economic cases for transport projects and record the weight different forms of evidence receive in decision making on these projects. But there are more basic steps of good practice too. The appraisal summary table is a useful method of presenting various elements of transport evidence to decision makers, but it is frequently relegated to the appendices of business cases rather than being front and centre.

To improve assumptions and future decision making, **a comprehensive evaluation system is needed. But none of our case study countries has this in place.** While the UK has areas of good practice and strengths, across all countries examined and in nearly every interview for this report, the unifying weakness is transport evaluation. This is partly because actors within the transport system are not currently incentivised to take it seriously and resources devoted to it are inadequate.

Despite the technical challenges of transport evaluation, these problems can be overcome. If evaluation is culturally embedded and consistently resourced at all levels of government and subject to external scrutiny it would put the UK at the forefront of global practice. This is not currently happening, and there is no one simple solution. We recommend changes at five distinct levels to address this:

- **The Transport Select Committee should take a greater role in scrutinising the ex-post evaluation of transport policies and projects.** It could do this on its own, but a more powerful approach would be to work with the Public Accounts Committee and National Audit Office to set up joint inquiries. These could include looking at accounting officer assessments of how evidence had been used. It should also formally review the DfT's monitoring and evaluation strategy and updates to the monitoring and evaluation programme.

- Ministers should retain evaluation responsibility for policies and large projects after delivery. **The Transport Select Committee should be able to recall them to discuss these projects even after they have changed role.**

- Similarly, within the DfT, **senior civil servants should retain evaluation responsibility for their projects up to five years after delivery**. This would help prevent turnover among civil servants hampering project evaluation and improve accountability.

- For projects the DfT funds at local or regional levels, such as those that receive money from the Transforming Cities Fund**, the money provided to those local areas should include specific ring-fenced revenue to fund evaluation.** These funds should be made available for the standard periods of transport evaluation (one and five years after completion) and could amount to around 1% of project budgets. These should be in addition to any wider evaluation the DfT undertakes of whole programmes.

- Local and sub-national government must develop their evaluation capability. Organisations such as the What Works Centre for Local Economic Growth, National Infrastructure Commission, sub-national transport bodies, the Local Government Association and Urban Transport Group should **pool knowledge and resources with local and regional government on conducting transport evaluations**. This could include combined authority or sub-national transport body areas using their economies of scale to undertake transport evaluations on behalf of local highway authorities and create regional centres of excellence.

4. The people who create and apply evidence

In previous chapters we discussed the institutions that use evidence and how it is analysed. Governments also need expertise and effective relationships to make good decisions and implement them. People working in government need to have the capability to understand the evidence in front of them as well as the capacity to dedicate time to interpreting it.

Additionally, governments require effective relationships with those on the outside who can provide new sources of evidence or challenge existing ways of thinking.

In this section we discuss how countries develop the internal expertise needed to engage with transport evidence and how they use external relationships and expertise to provide evidence within the policy making process and to challenge existing thinking.

Expertise and relationships in the UK

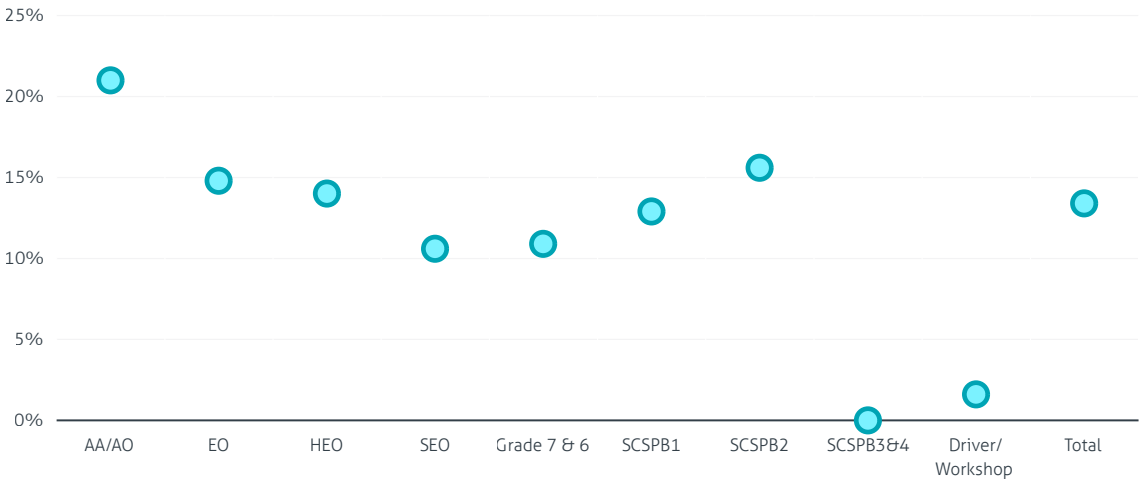
Internal relationships – churn, capability and capacity

Staff turnover is lower among the DfT analysts than elsewhere

Previous Institute for Government reports have highlighted the problems caused by excessive turnover in the British civil service, such as the disruption of policy implementation and loss of expertise.[1] However, we found relatively low levels of staff turnover in analytical professions in the DfT.

Analysts within the DfT tend to stay for relatively long periods, compared to the rest of the civil service, according to those with direct experience of both the DfT and other departments. This is borne out by the available, but limited, data. Most analytical roles are at the HEO, SEO and G6/G7 grades,[2] which as a whole experienced fewer than 15% of staff leaving the DfT last year, the same percentage of civil servants that left the department. This compares to over 25% in the Cabinet Office or over 20% at the MHCLG.

Figure 9 **Percentage of civil servants leaving the DfT by grade 2018**



Source: Institute for Government analysis of Department for Transport equality monitoring statistics 2018–2019.

Although the DfT does not release turnover data by profession, there are indications of variance – one interviewee remarked that moving roles every couple of years was the "natural lifecycle of policy making". Churn was also reported as being much lower in analytical professions.

But this is not a universal picture within the analysis function, as some specialists move more, particularly transport modellers who typically leave for the private sector and often stay for only one or two years. Retention is a particular challenge as there is limited potential for career progression within the civil service (the DfT is essentially the only department to have transport modellers) and private sector opportunities often pay more.

Even though churn is lower, some related problems remain. We heard about occasionally ineffective handovers and failures in institutional memory – one interviewee reported finding out by accident via the National Archives that some areas of their work had been done several years ago while preparing their own handover pack. This was not widespread among analysts, though. Lower levels of turnover among them had helped institutional memory in recent years.

Some turnover between government departments had also been beneficial. Analysts moving from Defra to the DfT in the early 2000s brought specialist knowledge of environmental issues like noise or air quality modelling that then became embedded in the DfT. One interviewee also said that in this period there had been "a lot more people coming into the DfT with different backgrounds, starting a positive change".

A bigger problem than internal churn in the DfT is the high level of turnover in other government departments. Interviewees told us that turnover of officials at both MHCLG and HMT had led to difficulties implementing or co-ordinating policies, such as those on green vehicle taxation, with previous working relationships having to be rebuilt and sometimes abrupt shifts in attitudes towards policies linked to key individuals having moved.

Central government departments have capability but capacity is stretched

The capability of decision makers is important to delivering evidence-based policy. If officials are not able to interpret evidence then its use may be less effective. Here we do not just refer to those in analytical professions but also transport policy experts, senior officials and ministers. They must have sufficient capability to understand not only the evidence available to them, but also its weaknesses and where evidence may be absent. It is not only a question of technical skills, although these are important, but also the ability to express complex concepts in an accessible way and for decision makers to interpret these.

Capacity is also crucial in the effective use of evidence – teams and individuals must have sufficient resources to collect and effectively respond to evidence and also to be able to communicate it. Evidence is less effective if teams and decision makers are overloaded and unable to respond to or analyse evidence, no matter their technical skills.

Technical skills are not evenly present across all fields. Some interviewees were concerned about the capability of the science and engineering professions and even whether these professions were well regarded inside the DfT. Baroness Kramer noted that engineers in the DfT were "not recognised as relevant, almost seen as having little to offer even on engineering projects".

In some fields, like transport appraisal and modelling, the DfT has significant capability that puts its teams at the forefront of international thinking, often in partnership with UK academic institutions. This is partly a result of having a highly centralised system, as we discussed in Chapter 3, which allows capability to be retained internally. The department also invests in specific training for economists and policy professionals on transport economics and evidence-based policy, delivered by UK academics and drawing on the UK's expertise in this area.

Capacity is a more significant problem. Central analytical teams are overstretched, limiting their ability to contribute fully to policy making. While some areas, such as social research, have grown their capacity, there are constraints in evaluation and transport modelling teams that reduce their ability to contribute across the department. Without greater capacity, policies and projects will either be delayed or will proceed without the benefit of analysis and evaluation.

Decision makers must understand the principles underlying the evidence they use

Transport is a specialised field with often highly technical evidence. New ministers in the UK are often "thrown straight in", with little time for training, as the Institute for Government has previously examined.[3] While DfT ministers receive an analytical and evidence pack on their second day in office, explaining the departmental approach to analysis and cost benefit analysis, levels of engagement and understanding vary. Members of the Transport Select Committee do not receive training on transport evidence and are reliant on their personal levels of interest in particular topics or their professional background prior to entering parliament. Opposition members also have very limited support.

At local levels, even this sort of introductory analytical briefing is often not provided, with only broad information available on responsibilities for managing transport. This may be supplemented by training on individual topics of interest prepared by the LGA or others. This creates disparities in how aware decision makers are of the principles underlying the evidence they assess and their ability to understand its strengths and weaknesses.

Other countries try to address this gap through training. K2 (the Swedish Knowledge Centre for Public Transport) runs 'knowledge days' for local, regional and national politicians to bring them up to date on the key issues in the field and the latest academic evidence. Other bodies, such as PBL in the Netherlands, explicitly include political stakeholders in disseminating their research findings.

While ministers and special advisers have major pressures on their diary, understanding at the very least the principles underlying how the DfT uses evidence should be a core part of their skillset. This will allow them to more effectively challenge evidence they receive and become more intelligent consumers of transport evidence.

Sub-national government often has poor capability and capacity

Capability is notably weaker outside the DfT and the devolved governments, albeit with areas of excellence at TfL, Transport for Greater Manchester (TfGM) and Transport for the North (TfN). These often emerged from economies of scale and virtuous circles. As the Centre for Cities told us, the most effective authorities had "pooled their sovereignty and produce more effective business cases and have the resources to actually do stuff and learn by doing".[4] Outside the largest authorities, roles were often funded by capital projects, meaning that a succession of these were required to ensure staff remained in place. One core city used this to sustain 18 transport planners and analysts on a total budget of under £100,000.

But this is not a sustainable or effective solution. It limits staff ability to work on evidence outside of that needed for capital projects and significant amounts of time and effort are spent bidding for required funding to simply sustain the current level of resources. The authorities that had the most capability were those that had longer-term streams of revenue funding, from devolution in the case of TfGM and TfN and from fares and other income for TfL. Given that funding has fallen by around 30% in real terms for transport/neighbourhood services[5] in recent years, it is not surprising that authorities without specific funding streams struggle to provide evidence. Central government cannot expect universal high-quality evidence to be provided from lower tiers of government while continuing to cut funding.

The DfT may be one of the departments that moves as part of planned civil service relocation outside London,[6] but moving analysts from London to Birmingham does not solve the issues we have identified with local government resourcing and evidence. To strengthen this relationship and improve understanding, the government should enhance capacity and resources at other levels of government.

One way it could do this is by pursuing additional secondments to and from sub-national and local government. This does not have to be restricted to the DfT, but could also extend to delivery agencies like Highways England or Network Rail. The ways in which such a change could operate vary – working in local government could be part of a rotation for civil service fast streamers or a way for middle grade policy specialists or economists to develop delivery experience, but both would require additional funding and resources for local government.

External relationships – academic advice and external expertise

The UK government needs to provide a "sense of authoritative guidance"[7] on evidence, as many practitioners will rely upon it. But it can never have a monopoly on expertise or experience. Bringing voices from outside government into the policy making process brings not only new perspectives but also new evidence. It is important for government to harness this expertise through effectively managing its relationships with those external to it.

Academic advice could be broadened

Without an independent research institution, the UK is particularly reliant on its transport academic sector to provide evidence, support and challenge. It is used not only for providing evidence in areas where the DfT lacks in-house capability (such as valuing the impact of travel time changes)[8] but also to provide assurance and peer review.[9] The key challenge with external engagement is the difficulty of getting a diverse set of voices in response, and including constructively within the process those who may be most critical of government.

Different bodies in the UK address this potential challenge in different ways. For example, the DfT shows willingness to engage by convening expert panels and stakeholder reference groups including more critical voices and transport users. The Transport Select Committee began diversifying the locations where they held evidence sessions and directly engaging with groups who aren't typically heard from in transport policy, such as young people.

The UK has world-class academic institutions for transport that are a strong resource for government, with the DfT working with academics at Imperial, UCL and Leeds University particularly closely, often in partnership with consultancy firms. But this resource means that evidence collection, particularly for technical economic evidence, often comes from this smaller group of universities and expertise outside this could be missed.

There is also a reliance on these universities to bring new academics into the field, but transport has few specific doctoral training centres, unlike fields such as energy research.

External advice needs to feed back into policy

In transport, with its tendency towards highly technical evidence, there is a potential for groupthink and engaging only those with specialist knowledge.

The most interesting attempt to incorporate external advice in the DfT is in transport appraisal, where a Joint Analysis Development Panel was created to provide external challenge. This panel includes people critical of some of the methods employed by government and we heard of a "genuine willingness" of the DfT to engage, including from panel members.

While these forms of engagement are positive, there needs to be a clear feedback loop into policy, or those who engage will be disheartened over time. A director of the Transport Planning Society, who had engaged on technical issues for a number of years, said: "It's been puzzling to win most of the arguments and then for so little to change."[10] Here, there is a question of scale of change and policy area. There have been extensive, but relatively minor, changes at the edges of cost benefit analysis while leaving the fundamentals unchanged. The DfT may also wish to consider whether there is merit in setting up a similar external panel that focuses on policy development throughout the department and includes those critical of current approaches.

Consultation with the public on policy can be poor

Active discussions with communities and transport users are limited outside of large infrastructure schemes. The UK's approach was compared unfavourably to some of our comparator countries by interviewees with experience of both, with one saying: "Public engagement is far better [in New Zealand] than the UK. The ministry talks about ideas with communities which I don't see happening here."[11]

The UK is poor by international standards at engagement with the public on infrastructure (including transport) projects.[12] This is not just the case in terms of collecting opinions on infrastructure projects, but also in terms of active engagement on why projects may be needed. This can create perceptions that evidence is not used effectively. With the case of HS2, issues have not been about a lack of evidence but about poor problem identification and consequent engagement on why the project is required. As we have previously noted, justifications including increased capacity, travel times, relief of existing networks and urban regeneration have all been used at various times for the project.[13] A lack of prior engagement or discussion can nullify even the most strongly evidence-based policy.

When it comes to policy engagement, it is more common to run simple calls for evidence or consultations, which can limit the level of response. A consultation on future emission standards for cars and vans, which could be of critical importance to achieving net zero goals, received 18 responses, only two of which were from individuals rather than organisations. Earlier and broader engagement could have increased the level of response and evidence brought to bear.

But there have been some improvements with engaging with end users for policies, with the recent policy research on traffic regulation orders[14] being a good example of early user involvement. However, there is no common approach across policy areas and some simply run a brief consultation on the DfT website, limiting both the volume and the diversity of responses, rather than pursuing more active engagement.

Expertise and relationships in comparator countries

Churn outside the UK

Lower levels of churn than the UK – with agencies playing a role in institutional memory

Even though most of the countries we examined had greater typical lengths of employment in either their ministries or specialist agencies than in the UK, this was often described by interviewees as being insufficiently stable to retain institutional knowledge.

For example, in the Netherlands people move between jobs every four to seven years (the average time is shorter in the central ministry, and longer in the *planbureaus*). Interviewees, however, still felt that this relatively long period led to challenges with institutional memory and handover between staff. This resulted in the unexpected outcome, also reported in the Institute for Government's report on the use of evidence in energy policy making,[15] of research institutes maintaining institutional memory. Staff in research bodies outside of the central civil service tended to have longer tenures more akin to academia than central government. They then acted also as a pool of institutional memory that civil servants could tap into when they changed role. These bodies effectively had a 'memory task' for the ministry alongside their main roles. This institutional memory helps mitigate against the impacts of staff turnover and reduces the risk of duplication of evidence.

Other countries also experienced relatively low levels of staff turnover. In Sweden, where there was turnover it was typically among transport specialists who moved elsewhere in the transport industry rather than generalists. This was also true in Germany, where movement between directorates of a single ministry was more common than between ministries.

These lower levels of turnover gave institutions greater stability and allowed them to develop the expertise of their analysts, but there was also a sense of a balancing act. One interviewee who'd worked in the Swedish civil service told us that if anything, he felt that people could be in post too long and that turnover allowed new ideas to enter departments.

High churn affecting the quality of evidence in New Zealand

In contrast, the challenges raised by frequent turnover were evident in New Zealand. Interviewees inside and outside the Ministry of Transport agreed there had been "big institutional memory challenges" caused by a major restructure in 2017 and frequent turnover, with at one stage, staff moving on average every 12 months.

The chief scientific adviser described the restructure as being an opportunity that "allowed a massive change in direction" and provided the ability to bring in new perspectives. But, as the ministry started to prioritise wellbeing, the lost expertise was described as a "nightmare" and the small size of the ministry exacerbated this problem. Turnover within teams led to excessive reliance on a "handful of people who know things", limiting the ability to effectively embed knowledge transfer and handover.

This meant that evidence and history were not effectively incorporated into policy development, with new staff thrown in at the deep end and forced to rely on Wikipedia for the background to the policy area they were responsible for.

Capability and capacity

Central ministries tend to be staffed by generalists

Capability and capacity within institutions in our comparator countries are tied to the structure and responsibilities of that body. Where there are smaller ministries, such as in Sweden, capability and capacity is instead found as much in specialist agencies that create and analyse evidence. Technical expertise is brought in through research institutes, consultancies and technical agreements with academia.

However, even where ministries in our comparator countries were larger and took on greater responsibility, they still tended to be primarily staffed by generalists rather than transport specialists. This affected their skills. Interviewees told us that in the Netherlands there are often "excellent project managers and comms people" but they did not always have experience in transport. Importantly, this was not seen as a weakness, but as an appropriate use of capability. They were able to use the research institutes to collect or interpret evidence and then present it to decision makers.

Smaller central ministries have less need for functions

Where ministries are smaller, the specialist, functional approach of the larger UK civil service is also less appropriate and the distinctions between professions are seen as artificial. In New Zealand, the small size of the ministry means that economists may be expected to work on the evaluation of a project after it's been built, as well as appraising its potential impact before construction or working on related policy. There are positives to this approach – staff become true experts in a project or policy across disciplines, but they also lose the opportunity to highly specialise their skills and risk being 'captured' by the policy area in which they work.

Institutional focus affects the forms of evidence produced

The UK has historically prioritised economic evidence, meaning there is an emphasis on economic capability. In contrast, we heard that transport specialists at the BMVI in Germany are more likely to have an engineering background. This also means that there was less focus on social research (which is undertaken by research bodies like DLR). People within the federal government told us they considered that social research skills were a priority for academics to have to undertake their work, but that it was less important for civil servants to be able to do this. These may seem trivial differences, but they can affect the sort of evidence that is used and prioritised, or even thought of as 'evidence'. One researcher told us of the difficulty of getting research through to the German ministry on transport and social exclusion as it was simply not thought of as a transport 'issue'.

This is not to say that there are easy solutions or that recruiting staff with different backgrounds is a panacea. In one specialist body in Sweden, we heard that there could be internal turf wars or sub-cultures within units, with a "palpable" tension existing between the engineers, economists and environmental planners over what evidence to emphasise as more people with environmental science backgrounds joined.

Academic advice – lessons from comparator countries

The UK academic sector and approach is internationally influential

The UK transport academic sector is a national strength and has international influence with all our comparator countries, particularly New Zealand. It also has good international connections, with interviewees in Sweden, New Zealand and the Netherlands citing projects they had worked on with UK academics.

The UK's internal structures also influence countries' approaches to academic advice. The case of the UK, and DfT specifically, were also influential in the New Zealand Ministry of Transport adopting a chief scientific adviser (CSA) model in 2018, with a desire to better integrate scientific perspectives and evidence checks into decision making. This connection has also involved the New Zealand transport CSA having frequent contact with his UK counterpart, sharing expertise and experience.

These connections are important because, like the UK, New Zealand does not have a public transport research institution. As the smallest of our comparator countries, it does not have a transport academic sector that is developed enough to fill this gap and there is a strong perception about a lack of national capacity. Policy makers frequently look to the UK and Australia for academic research and the ministry often contracts UK transport academics, seconded or working at distance. This form of arrangement benefits both parties, but it has, according to an interviewee, held back the development of a strong domestic academic sector that could help produce evidence.

Informal networks limit the diversity of academic advice

While the transport ministries and agencies across comparator countries consistently engaged with academic advice, the pool of academics providing this evidence was often limited. This is particularly the case where there is a reliance on informal, personal relations that can prevent non-typical voices from being heard, such as in New Zealand and Sweden. This can limit the sources of evidence or the views of those asked to communicate it, ultimately affecting the quality of the policy.

Informal relations are more likely where there is a much smaller pool of transport academics, like in New Zealand, as policy makers do not consider it necessary to engage in a systematic way. The chief scientific adviser claimed he can "probably name all 20 academics working on transport", but we also heard that access to government could depend on luck and academic networks were consequently underdeveloped.

In Sweden, where there is more frequent movement between public research bodies, central and regional government, engagement with external expertise is often driven by the personal relationships that this develops. While this helps integrate academic thinking into government and builds internal capability, it means that those who are not part of this circle can find it hard to share their expertise. This also damages the external challenge function – someone who is seen to rock the boat too much and challenge established norms can be excluded. We heard anecdotally that academics had been shut out of government funding networks for particularly strong views that challenge the dominant narrative.

A desire for fast results affects the sources of evidence

Governments in our comparator countries often need policy or technical research undertaken at very short timescales. Consultancies, which have significant resources and a desire to ensure that their staff are highly utilised, are most able to respond to short-term tenders and make staff available. Research institutes are thought to take too much time and often set their priorities a year in advance, limiting their flexibility.

Interviewees told us that this approach affected the evidence that came back and who it came from. In New Zealand, small pieces of research are almost always done by consultancies rather than academia owing to short timescales of procurement. Similarly, in countries with independent research bodies, ministries seeking quick evidence can sidestep them and go to the market.

External expertise – lessons from comparator countries

Independent public research institutes widen the forms of evidence considered

The public research institutes in the Netherlands and Sweden that have their independence guaranteed, either by statute or protocol, have greater freedom to seek out new forms of evidence, even if it competes with the government's preferred forms of evidence, and challenge accepted methodology.

We saw this with PBL in the Netherlands. It was working extensively on uncertainty and qualitative future scenarios based on the theories of a UK academic, directly in contrast to the ministry's and CPB's (and the UK's) more quantitative preferences for evidence. Here, this freedom allowed new methods to be developed and consequently incorporated into transport policy thinking at national and local levels.

The structure of these bodies also affects the sort of evidence that is collected, and who it is collected from. The use of convening bodies like the Netherlands' RLI also enables attempts to engage voices outside the 'usual suspects' as experts to be involved in policy making and the provision of strategic advice. The RLI secretary general described an explicit push for this. As it looks for "new initiatives, like Mobility as a Service or in other fields, and get new people involved", RLI can "use [its] information specialists to find all these people with a different approach and bring them in". A more varied evidence base can bring additional perspectives into government or require policy to be considered in new ways.

But this is not a panacea for effective transport policy and engagement. RLI relies on the use of expert meetings, designed to get all views around a table to discuss and come to a broad agreement, rather than detailed technical appraisal followed by political decision making. We heard that this consensus-seeking approach, rarely used in the UK, means that the risk of outlying voices not being heard is "larger in the Netherlands" as it is completely conditional on who is included in these meetings, and those who are least likely to agree can be excluded.

Comparing the effectiveness of those who gather evidence

There is a strong interplay between institutional structures and a country's approach to expertise. For those nations with smaller central departments, such as Sweden, retention of domain-level expertise within the organisation is less immediately crucial as other agencies exist to fill the gap. In more centralised systems like the UK's or New Zealand's, internal expertise is critical to effective use of evidence.

While there were relatively low levels of churn in the UK for transport analytical professions, turnover was still significantly higher than in most other countries. One area of commonality across countries was that transport analysts tended to have greater job stability than policy professionals. The underlying reason for this is unclear (it may be that transport is a discipline particularly appealing to analysts), but it indicates that the problems with churn raised by previous Institute for Government research are less acute in the area of transport analysis.

External experts interviewed in different countries had regularly needed to explain past departmental logic to central government departments as no one was available who could recall the origins of a policy. Having long-lived external evidence bodies has helped this institutional failure, as they develop their own institutional memories and have lower turnover. In the UK, this problem was less acute owing to lower turnover – but some areas of poor institutional memory remain. As noted in the Institute's *Moving On* report, the UK could reduce risks relating to this by undertaking more formal succession planning and handover.[16]

The UK does not lack internal central government capability for assessing and interpreting evidence, particularly compared to other countries, but there are some challenges around available capacity and retention. This is particularly true for the profession of transport modelling across the public sector and for analytical professionals in local government.

Local and regional government capability and capacity to produce evidence for transport policy is variable. The UK's uneven sub-national set-up, with some areas better able to pool and use resources for analysis and evidence, does not place everywhere on an equal footing. Some places, typically those outside the large cities or combined authorities, are less able to create and use evidence effectively, particularly outside of large capital projects.

We recommend the DfT bolsters these capabilities and also its own knowledge of the challenges of policy implementation through pursuing more secondments to and from other tiers of government. This would allow central, regional and local government to share knowledge effectively and improve analytical capability a sub-national level.

The capability of those producing evidence in central government was rarely in question, and both government in the UK and elsewhere use extensive training to develop the expertise of their officials when it comes to evidence. The Infrastructure and Projects Authority provides training for ministers, including those from the DfT, on managing major projects[17] but nothing similar exists to understand transport evidence. Political decision makers including ministers, select committee members and local politicians should have a comprehensive understanding of the principles underlying transport evidence, modelling and appraisal. How this is achieved may differ. For example, select committees may wish to offer training or examples of best practice to their members. For ministers with an involvement in transport and for special advisers, **we recommend that they are offered formal training in the sources, types and use of transport evidence.** This may be provided by the civil service, or by an external provider such as a consultancy or university.

The UK and New Zealand are more reliant on the UK academic sector to provide their external evidence, having no independent research institution. This allows for the development of greater expertise within universities, where the UK is among the world leaders, but it needs to be harnessed effectively and developed for the future.

5. Conclusions

The effective use of evidence is fundamental to the successful delivery of UK transport policies. The government's ambitions require strong and authoritative evidence to be applied to its policy decisions. That needs the right institutional set-up, the best people and expertise and the highest quality analysis. The government has key priorities including delivering on net zero and levelling up. To achieve these, getting transport policy making right will be crucial. It will need not only to respond to the challenges that currently face the transport system but to adapt to the future.

The UK has some strengths in how it generates and applies evidence:

- **Policy making follows clear rules and analytical processes,** with well-resourced and capable professionals inside government able to interpret evidence, particularly economic evidence. Analysts in the DfT and elsewhere are well integrated into policy making processes and well regarded by those outside central government.

- These processes are well-established and **at the forefront of international practice**, particularly with regard to economic appraisal. The UK's transport economic appraisal system is internationally respected and influential.

- There is **relatively low turnover of people** in the DfT as compared to other departments, and particularly among those engaged with evidence. Those in post have the skills to analyse and present available evidence.

- The UK relies on an **authoritative academic community** to bring in external evidence and to challenge its assumptions. This also includes the effective use of the chief scientific adviser, which meets some (but not all) of the roles of independent research institutions in other countries.

But the way evidence is used in UK transport policy can still be improved upon. There are five key areas of weakness for evidence in the UK transport system:

- With the DfT as the centre of transport decision making, evidence crossing multiple departments **is inconsistently used**. Poor understanding of local capacity and data also negatively impacts the effectiveness of DfT policies.

- While the DfT has significant analytical capability and a preponderance of economists, this means that **other forms of evidence can appear neglected in transport decision making** – including social research, evaluation or engineering.

The department should use a broad range of evidence and types of sources for its decision making and should be scrutinised on all of these, not simply value for money.

- The **way evidence is used in decision making in not transparent**. Too often, outside observers are left guessing as to the weight different forms of evidence have been given in decisions and business cases are rarely published. While CBA and analysis are technically strong, decisions do not always reflect CBA scores so transparency is even more important.

- This is linked to the fact that **scrutiny and openness is limited**. UK transport modelling and economic appraisal is largely a complex 'black box' with limited ability outside of a narrow group of highly technical professionals to engage. Other forms of evidence also receive limited external scrutiny and attention. While the NAO is powerful in its scrutiny function, its limited remit and the lack of other influential organisations with similar undertakings means that evidence outside of the sphere of value for money is neglected.

- As with all countries we examined, **evaluation is inconsistent** and unevenly applied. Skills and capacity are not consistently present in local government and areas of good practice have not propagated through the transport system. This has led to investment and policies that are poorly monitored, leaving decision makers uninformed about the effectiveness of their actions.

What could we learn from overseas?

Our assessment of comparator countries does not conclude that any particular system is 'better' than another. The systems are partially products of institutional history and wider culture. It would not be possible to replicate the Swedish style of transport policy making and evidence without completely redesigning the UK civil service structure and levels of ministerial responsibility. The Dutch approach to external evidence bodies would require fundamental changes to decision making culture alongside far more independent production and assessment of evidence.

The approach to evidence is also partly a result of the large central decision making function that is responsible for most evidence production. While the UK could strip some of its analytical or research functions from central government and put them in a separate body, the level of disruption, cost and uncertainty from those changes is not made up for through any potential increases in effective use of evidence.

Still, there are a number of lessons the UK could learn from other countries to improve the use of evidence in transport policy:

- The UK is the only country we examined with no published or stated transport strategy or long-term investment plans across multiple modes of transport. A more explicit statement of the UK's **transport strategy** and its investment plans, in common with all other countries examined and building on existing local and regional strategies, would aid scrutiny and help in commissioning the

right evidence. At a minimum, the National Infrastructure Strategy should be supplemented with updated national policy statements that bring these into line with current thinking on issues such as climate change, devolution or levelling up.

- A greater **culture of openness** would assist transparency, ensure better scrutiny of underlying evidence and allow for more honest debate on transport projects. It should be routine to publish business cases and assessments of policy, beyond those assessments performed for the Regulatory Policy Committee, in order to improve scrutiny and debate over evidence. While publishing cabinet briefings like in New Zealand may not suit the UK system, routinely publishing business cases like in the Netherlands would be beneficial in allowing greater public debate on the evidence that underlies projects.

- The UK could better integrate its **treatment of uncertainty** in policy and investment. Policies and infrastructure should be tested against multiple futures, as in New Zealand, to ensure they are more resistant to uncertainty. At the least, this would include testing all of them against the most and least positive scenarios for growth in travel.

Our research shows that there are solid fundamentals in place for transport policy making in the UK, but changes are required to ensure the best decisions are made. Transport justifies continued high levels of public investment with a comprehensive evidence base, but needs to embed a culture of evaluation as strong as its robust approach to project appraisal.

It also needs to be more transparent as to how it uses this evidence in its decisions, doing otherwise leads to a culture of suspicion that evidence that has not been used. Our research found no evidence that this was the case, or that it had been captured by any particular set of lobbying or regional interests, but in not being open these beliefs can grow.

Finally, the UK and its devolved nations continue to be highly centralised in their approaches to transport. In some ways this has been good for the use of evidence. Central and devolved governments have the scale to develop deep expertise and the ability to put robust structures in place. However, having local governments continue to bid for funding from central government does not result in good use of evidence. Where funding and resources are devolved, stable and long-term, use of evidence improves.

Annex A

Research institutes in comparator countries

The Netherlands

The Netherlands Institute for Transport Policy Analysis (KiM). A small research institute (approximately 30 FTE) situated within, and fully funded by, the Ministry of Infrastructure and Water Management. KiM's research agenda is primarily set by the ministry, but parliament can also request that KiM undertakes specific research – an increasingly common move that happens two to three times a year.

Netherlands Environmental Assessment Agency (PBL). A large *planbureau* (planning bureau) with approximately 300 FTE, which does policy analysis in the fields of spatial planning and the environment. PBL is part of the Ministry of Infrastructure and Water Management, which provides its full funding, but its independence is valued highly and safeguarded in the Protocol for the Policy Assessment Agencies. PBL is a "knowledge provider", which "can only say what the research says, never give proper recommendations" .

Netherlands Bureau for Economic Policy Analysis (CPB). A *planbureau* with 150 FTE that is part of the Ministry of Economic Affairs and Climate Policy, and primarily does economic analysis and the official forecasts. It is funded through the ministry, though up to 20% of its budget of €13m can come from external assignments. CPB is highly regarded internationally as a fiscal watchdog, and its prestige was highlighted multiple times as being important in the acceptance of the evidence it provides.

Council for the Environment and Infrastructure (RLI). The 'strategic advisory board' for the Dutch government and parliament in this field , with 10 appointed council members. RLI does not conduct any of its own research, and typically uses evidence generated by PBL. The general secretary summarised RLI's role as being "providers of expert judgement, not science".

Sweden

Swedish National Road and Transport Research Institute (VTI). An independent research institute with around 200 FTE, based in the Ministry of Infrastructure. It researches applied engineering, infrastructure and economics; it is also integrated into the wider academic community through a number of professorships. Around 20% of its budget comes from state grants, with 80% coming from clients.

K2 (the Swedish Knowledge Centre for Public Transport). A 'virtual' institute with 50–60 part-time staff, and a limited physical presence, sponsored by industry, government and academia. It is designed solely to provide research on public transport. We were told that it "has no analogue anywhere in the world", with its nearest UK equivalent being a specialist version of the Science Advisory Council.

Germany

DLR (German Aerospace Centre). A very large science research centre with around 8,000 employees and a budget of €1,035m. It undertakes transport and aerospace research but is not formally an agency of the Federal Ministry of Transport and Digital Infrastructure (BMVI).

The Advisory Council on the Environment (SRU); and **the Advisory Council on Global Change (WBGU).** Independent advisory bodies, consisting of small numbers of university professors appointed by the federal cabinet, but they can be seen as pushing their own beliefs rather than providing a neutral view of evidence.

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