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 Foresight

Governance of UK Transport Infrastructures

Future of Mobility: Evidence Review

Foresight, Government Office for Science

Governance of UK Transport Infrastructures

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This report has an information cut off date of May 2018.

Executive Summary

Transport plays a vital role in every day life. The efficient movement of people and goods is an essential part of a productive economy as well as being important for social cohesion, health and well-being. Investment or policy intervention in the transport system is, therefore, in support of these other wider objectives or to tackle externalities such as climate change or congestion.

The institutional structures underpinning transport have, however, developed around modes and networks and around the industries of transport. The arrangements vary significantly between modes and, increasingly, across areas. **There is a multitude of governance networks rather than a single overarching 'governance of the transport system'. This makes it difficult to achieve integrated outcomes.**

The importance of transport to achieving broader societal goals is clearly recognised, but the arguments about spending across different areas and between modes can be influenced by logics and processes within the transport sector rather being driven by how best transport can serve those wider needs. Some of this disconnect is hard-wired into the institutional structures and governance processes. The ability to coordinate a combination of public and private investments to achieve integrated outcomes, sometimes across adjacent areas, has been a recognised challenge for some time. **The institutional landscape has, for the most part, become more and not less complex.**

There is a significant diversity in institutional arrangements across the UK, particularly between local and national tiers of government. This in part reflects the different size of the networks and populations being governed. In Northern Ireland all transport is conducted by a national department. In Scotland and Wales the two primary tiers are local and national although regional decision-making continues to play a role- formally in Scotland. In England there are six different spatial tiers. There has been a trend towards layering of institutions over time with some of the change coming from outside of transport, for example with Local Enterprise Partnerships and City Devolution and growth deals. This sometimes results in misaligned boundaries although it has brought together employment, skills and transport in some places. **The reform of sub-national governance, particularly in England, has for the most part added layers to decision-making processes.**

Looking across developments related to all modes and jurisdictions, the **following key strengths of the governance arrangements** were identified:

- The importance of transport has been recognised in increasing capital spending.

- Longer-term spending commitments which are in place for road, rail and some aspects of urban policy allow for better planning and delivery.
- Transport for London is recognised as a globally leading urban transport authority. Other UK cities are being given more powers and are starting to be more ambitious, although it is early in this process to draw conclusions about the effectiveness of these initial reforms.
- Transport markets are professionally regulated with good interoperability and safety records across all modes.

Different key challenges emerged when looking at each of the specific modes or networks. Across the whole transport system however, the following challenges were identified:

- Siloes persist between transport and other policy areas so, despite the recognition of the broader role of transport, aligning decisions to achieve co-benefits is not seen to be easy.
- The current spending pattern distribution will be difficult to maintain with the report identifying splits between local and national networks and capital and revenue as particular issues. These issues also vary significantly across the UK.
- The transition to an electric vehicle fleet will create a transformation in how we pay for motoring. This is a sensitive topic for the general public and politicians but avoiding tackling this is likely to increase the pressures on transport networks and budgets.

Factors which seem important to the effective governance of infrastructure projects were:

- Identification of a clear need;
- Developed consensus across key actors; and
- A clear funding channel

The report was also tasked to look ahead to 2040 at how these key governance challenges might change as a result of the advent of new technologies such as automated vehicles and mobility as a service. The reasons for state intervention in transport will remain robust although the smart mobility transition changes the rules and networks through which interventions will occur. The smart mobility transition is an opportunity to remove or improve some of the challenges that the current structures create and to achieve goals which have proven to be difficult with the existing technologies, structures and incentives. However, doing this will be challenging as the exact timing, speed and nature of the changes are unclear. Key challenges include:

- Ensuring that the transition to new forms of mobility also manages the transition of existing modes of transport including issues such as employment and socially necessary service provision obligations.

- Rethinking and clarifying the role of the state in regulating new mobility services, whether that is in a more or less hands-on manner. It is an opportunity to simplify some of the boundaries and inconsistencies in the existing governance system but also has the potential to layer further complexity into the governance environment.
- Proactively managing the use of roads such that the technologies are bent to supporting the achievement of public as well as private objectives. Early evidence signals the potential to achieve gains from harnessing the new technologies but also risks worsening conditions if the access and use of vehicles in the network is not pro-actively managed.
- The need for clarity over who pays and how we pay for the costs of the transition to smart mobility. There are new infrastructures and maintenance costs to be paid for and this could be part of a wider discussion about the changing ways in which we pay for travel.
- Revisiting who does what. The evidence points overwhelmingly to an increase in complexity in the governance environment, and a requirement for new advanced skills in the sector at the same time as there is a declining resource base in local and national government to manage this. There are opportunities to develop innovative shared services and to pass responsibilities, particularly up from the lowest tiers, to steer the transition effectively.

The experts informing this report suggest that, without clarity about the regulatory role of the state and the position of the different authorities in managing different parts of the transition, delivering the benefits of smart mobility will be difficult and there may be some unwanted and hard-to-manage downsides.

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List of abbreviations

BAB	Bus Appeals Board
BSOG	Bus Service Operators Grant
BUUK	Bus Users UK
CAA	Civil Aviation Authority
C&MA	Competition and Markets Authority
DBFO	Design, Build, Finance, and Operate
DVSA	Driver and Vehicle Standards Agency
HLOS	high level output specification
EGIP	Edinburgh-Glasgow Improvement Programme
EV	electric vehicle
ITA	integrated transport authority
LEP	local enterprise partnership
LTP	local transport plan
MAC	managing agent contract
MCA	Maritime and Coastguard Agency
NTS	National Transport Strategy
ORR	Office of Rail and Road (formerly Office of Rail Regulation)
PSV	public service vehicle
PTA	Passenger Transport Authority
RDG	Rail Delivery Group
RIS	Road Investment Strategy
RTP	Regional Transport Partnership
SOFA	statement of funds available

SRN strategic road network

STB sub-national transport bodies

STP Strategic Transport Plan

TfN Transport for the North

UAV unmanned aerial vehicle

VOSA Vehicle and Operator Services Agency

I. Background

This report was commissioned by the Government Office for Science as part of its Future of Mobility project. The programme of work was to address the following key questions:

- A. Institutional structures: Who are the key actors in the UK landscape for transport infrastructure?
- B. Governance and influence: What are the factors affecting influence within the UK transport system?
- C. Outcomes: What are the pain points in the decision-making system and what works?
- D. What will change looking out to 2040?

The scope of the work was to look at all modes but to limit consideration to the governance of transport within the United Kingdom. This means that for modes with significant international components the focus on points of interchange and on conventions which also affect travel within the United Kingdom. The work was to look at important differences across the four countries of the UK and at differences within countries where significant. While we recognise the potential interest in international comparators of governance this was out of scope for the study.

2. Method

The approach adopted for this research was desktop review combined with expert workshop. Expert reviews were commissioned for each of the topics shown in Table 1. These can be found in the [Technical Annex](#). The draft findings from the first 11 topics were set out in an expert workshop held at the National Railway Museum in York on 27th November 2017. This workshop served as a validation check of the findings and as an opportunity to debate the key pain points and what works. Together these form the basis for answering points A to C above.

Table 1: Expert Reports available in the Technical Annex

Topic	Author	Affiliation
Aviation	Dr Lucy Budd	Loughborough University
Bus and Coach	Professor Peter White	University of Westminster
Freight	Dr Anthony Whiteing	University of Leeds
Maritime	Professor Alf Baird	Independent
Rail	Professor Chris Nash	University of Leeds
Road	Dr Phillip Wheat	University of Leeds
Scotland	Professor Iain Docherty	University of Glasgow
Transport for the North	Nigel Foster and Emma Roberts	Fore Consulting
West Yorkshire Combined Authority	Nigel Foster and Emma Roberts	Fore Consulting
Tees Valley Combined Authority	Nigel Foster and Emma Roberts	Fore Consulting
Local Transport	Professor Greg Marsden	University of Leeds
Automation	Professor Oliver Carsten	University of Leeds
Urban Futures	Professor Iain Docherty	University of Glasgow
Funding	Dr John Nellthorp	University of Leeds

The workshop was also used to identify priorities for consideration out to 2040. Further think pieces on automation and urban futures were then completed. A further workshop on funding hosted by KPMG on 7th December in London, developed a funding futures briefing note. These resources all serve to inform bullet point D: 'What will change looking out to 2040?'

It is not possible, or indeed helpful, within this summary report format to include all of the intricacies of the differences in governance approaches modes and jurisdictions. We recommend that readers make use of the Technical [Annexes](#) in parallel with the main report if they would like more detail.

3. Institutional structures: Who are the key actors in the UK transport infrastructure landscape?

The institutional structures underpinning transport have developed around modes and networks and around the industries of transport. The arrangements vary significantly between modes and, increasingly, across areas. There is a multitude of governance networks rather than a single overarching 'governance of the transport system'. The governance arrangements of the main modes are reviewed briefly in turn below drawing directly on the expert reports, that are included in full in the [Technical Annex](#).

3.1. Aviation

Aviation is an inherently international mode of transport and, for reasons of public safety, national security and global geopolitics, it has been subject to formalised international organisation, agreement and regulation since the mid-1940s. The core governance structure and regulatory regime for air transport, which includes UK domestic operations, is international. A key schematic of the different organisations involved at different tiers is shown in Figure 1, with brief descriptions provided below.

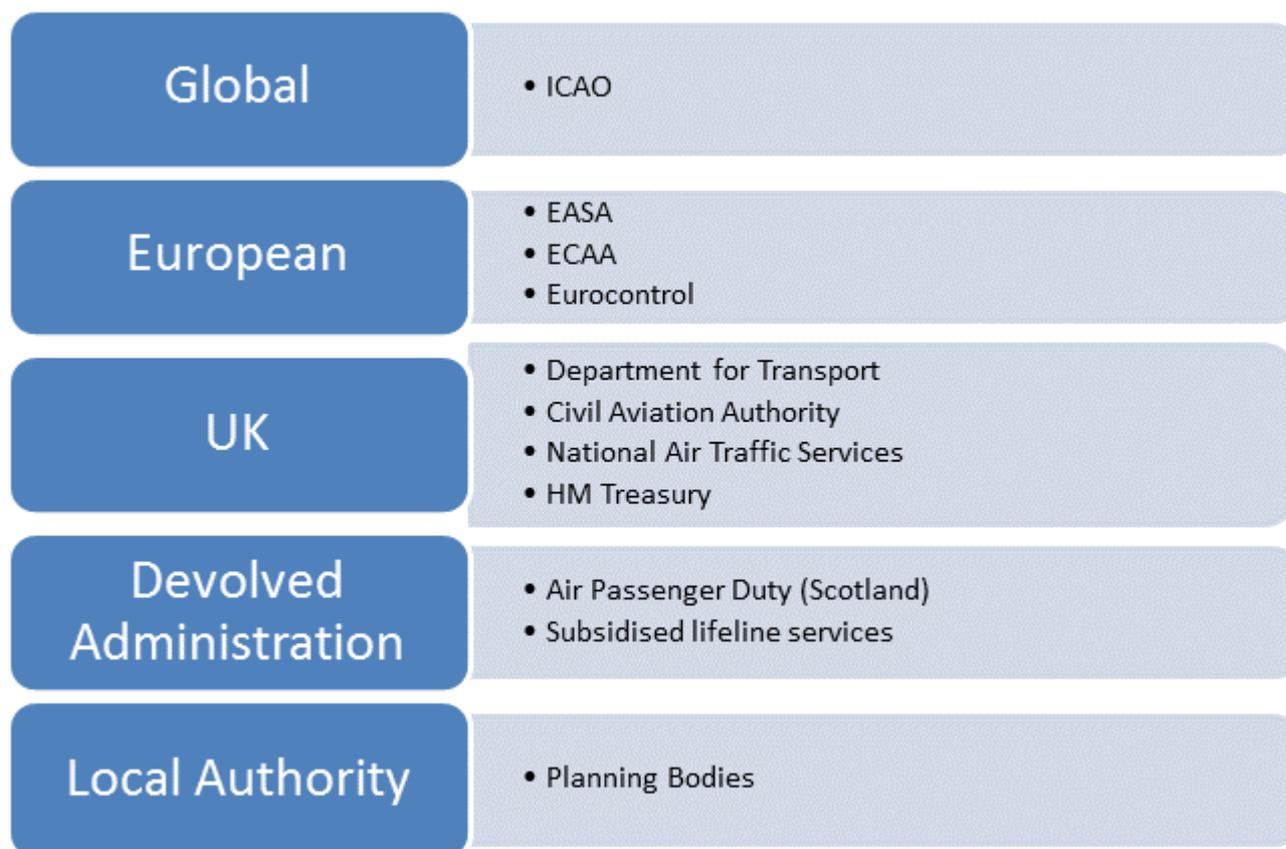


Figure 1: Simplified Mapping of Key Actors by Governance Tier in Aviation

The International Civil Aviation Organization (ICAO) is a United Nations Specialized Agency which was established in 1947 within the framework of the 1944 Chicago Convention. ICAO is concerned with ensuring the safe, orderly and sustainable development of international air transport. ICAO works with the Convention's 191 Member States to develop and reach consensus on Standards and Recommended Practices (SARPs) concerning aviation safety, security, environmental protection, economic efficiency and regulatory compliance that are used by individual Member States to ensure their aviation operations conform to global norms (ICAO.int, 2017). The UK is an active member of ICAO, and a UK representative sits on the 36 member elected Council.

Within the European Union, the European Commission develops policies of pan-European standardisation and harmonisation in the areas of commercial air transport safety, operations and regulatory compliance. European Regulations and Directives address:

- Common rules for the operation of air services within the single European market (Regulation EC 1008/2008).
- Safety, including accident investigation, airworthiness, and the **European Aviation Safety Agency (EASA)** and aviation security.
- Environmental protection and safeguarding (including the Emissions Trading System).

- Airport slot allocation and ground handling.
- Air traffic management (ATM), including the creation of a Single European Sky (SES).
- Competition rules, including anti-trust protection and state aid.

The European Civil Aviation Conference (ECAC) is an intergovernmental organisation with 44 member states, established in 1955. It aims to harmonise aviation policies and practices across Europe, working in partnership with ICAO and the EU.

Eurocontrol – is an intergovernmental organisation established in 1960 as the European Organisation for the Safety of Air Navigation. It is responsible for formulating pan-European policy on air navigation, airspace, innovation in ATM and environmental performance for its 41 member and 2 Comprehensive Agreement States.

The UK Government **Department for Transport (DfT)** leads UK negotiations on aviation matters at European and international forums, develops UK aviation legislation and formulates policy. DfT contains the Air Accident Investigations Branch (AAIB), it sponsors the UK's National Aviation Authority, the Civil Aviation Authority (CAA). As the sponsoring department of the CAA, DfT establishes the CAA's remit, legal framework and strategic objectives

The **Civil Aviation Authority (CAA)**, which commenced work in 1972, is the UK's independent regulator responsible for all civil aviation regulatory functions under UK and EU law and international directives. It is the UK's 'competent authority' and a public corporation of DfT. The CAA publishes UK aviation legislation (which incorporates international and European directives) as CAPs (Civil Aeronautical Publications). The CAA's work is split into the following activities (see CAA, 2010):

- Corporate functions – including legislation, governance, procurement, aircraft registration, charges and statistical returns.
- Safety Regulation Group (SRG) – responsible for areas including safety standards, personnel licensing, medical, airworthiness, safety management systems.
- Consumer Protection Group – responsible for the Air Travel Organiser Licence (ATOL) scheme, airline licensing and air passenger rights.
- Directorate of Airspace Policy – responsibilities include the Single European Sky, Instrument Flight Rules, environmental research and radio licences.
- Economic Regulation Group – responsible for airport slots, NATS and economic policy.

- Consumer Panel (formerly the Air Transport Users Council) offers an independent advisory role and represents the interests of air transport consumers. It has no decision-making responsibilities or accountability role.

NATS (formerly National Air Traffic Services) is the UK's Air Navigation Service Provider responsible for providing en-route air traffic services within UK and North Atlantic airspace as well as aerodrome and tower services at 14 UK airports. The CAA licenses NATS en-route services and licenses the air traffic controllers it employs. The CAA is also responsible for the economic regulation of NATS' en-route and oceanic airspace charges.

HM Treasury – sets the rates for Air Passenger Duty (APD), which is levied on all passenger flights from UK airports. APD rates vary according to the class of travel and distance of the destination airport (in miles) from the UK (see Seely, 2016). In May 2015 it was announced that APD would be fully devolved to Scotland (ibid, 2016).

Some aspects of the 1982 Civil Aviation Act pertaining to aerodromes and some parts of the 1986 Airports Act relating to airport byelaws and the transfer of airport undertakings of local authorities (LA), Public Service Obligation (PSO) routes and APD are devolved to Scotland (see Butcher, 2017). The Air Discount Scheme (ADS) is a Scottish Government initiative that operates under the EU's General Block Exemption Regulation (Articles 107 and 108, EC 651/2014) which aims to make air services more affordable for remote communities in the Scottish Highlands and Islands by providing a 50% discount on the core airfare on eligible routes (see Air Discount Scheme, 2017).

The Welsh Assembly is not permitted to legislate on aviation matters except: financial assistance to providers of transport services or facilities; strategies by Welsh Ministers or local authorities about the provision of air services; and the regulation of the use of aircraft carrying animals for the purposes of protecting human, animal and plant health, animal welfare or the environment (see Butcher, 2017). Northern Ireland has no devolved powers over aviation.

Local authorities (which may own, in whole or part, the airports within their boundaries) are responsible for local planning applications, noise regulations and voluntary agreements.

The Airports Act of 1986 established the legal basis for the privatisation and commercialisation of UK airports. The former British Airports Authority (BAA) was privatised in 1987 and, along with a mix of other private investors, it has developed commercial interests in UK airports. The UK airports with the largest public sector stake are: Birmingham (49% owned by seven West Midlands Councils), Manchester Airports Group who own Manchester, East Midlands, Bournemouth and London Stansted (35.5% Manchester City Council and 29% nine Greater Manchester Councils), Cardiff (100% Welsh Assembly Government), Prestwick airport and

Highlands and Islands Airport Ltd which operate 11 Scottish airports including Inverness (100% Scottish Ministers), and Newcastle (51% owned by seven local authorities in North East England) (Butcher, 2016).

UK-registered airlines provide services for passengers and freight and may seek to influence Government policy regarding airport charges, future airport capacity, passenger rights and environmental safeguards. UK airlines pay licence fees in respect of airframe licensing and their Air Operators Certificates (AoCs) which help fund the CAA.

Investment in new airport capacity and new air services is primarily a matter for the private sector. However, successive national governments have developed and maintained a national aviation strategy. This reflects the need for capacity enhancements in the South East of England, where competing alternatives exist. It also reflects the need for quite considerable additional surface transport investment (likely to be funded through a mixture of public and private sources) to service new capacity, and concerns over environmental degradation. The independent Airports Commission reported in July 2015 (Airports Commission, 2015) but there has yet to be a decision on new runway capacity.

3.2. Maritime



Figure 2: Simplified Mapping of Key Actors by Governance Tier in Maritime Transport

The **International Maritime Organization (IMO)** is a specialised agency of the United Nations. The IMO sets standards for the safety, security and environmental performance of international shipping in areas such as 'ship design, construction, equipment, manning, operation and disposal' and 'Energy efficiency, new technology and innovation, maritime education and training, maritime security, maritime traffic management and the development of the maritime infrastructure' (IMO, 2017).

The **European Commission** sets out an overarching framework for maritime governance, working with the IMO. Specific policy strands for the Commission focus on the role of ports within the Trans-European Network and in particular on the Connecting Europe Facility (CEF) aimed at the core seaport network. Working with the European Investment Bank, the Commission seeks to leverage much larger investments from national or local government or the private sector.

In addition, the Commission's Motorways of the Seas initiative (European Commission, 2017) seeks to promote the use of shipping as an alternative to land transport. The Commission is also working to promote a network of liquefied natural gas re-fuelling stations at the core maritime ports that make up the Trans-European Network, as well as a clean shore-side electricity supply, and tighter rules on maritime safety, which is regulated by the European Maritime Safety Agency (EMSA, n.d.).

DfT describes its main responsibilities under ‘Shipping’ as twofold, namely: overall maritime strategy and guidance, and; keeping shipping safe through the Maritime and Coastguard Agency (MCA) (National Audit Office 2015). DfT has overall responsibility for maritime policy across the UK. Maritime policy is a broad area, in addition to shipping, it touches on marine business services like insurance, trade, environmental impacts and skills/ recruitment in the sector. DfT is supported by the MCA, the Marine Accident Investigation Branch (MAIB), and the General Lighthouse Authorities (GLAs) which provide a range of maritime delivery functions on behalf of the department (Department for Transport 2015). The MCA is an executive agency of DfT whose responsibilities include:

- providing a 24-hour search and rescue service;
- enforcing ship safety;
- preventing pollution;
- promoting seafarer health;
- regulating and verifying safety and welfare standards by survey and inspection;
- registering and certificating ships and seafarers; and
- managing maritime pollution and response.

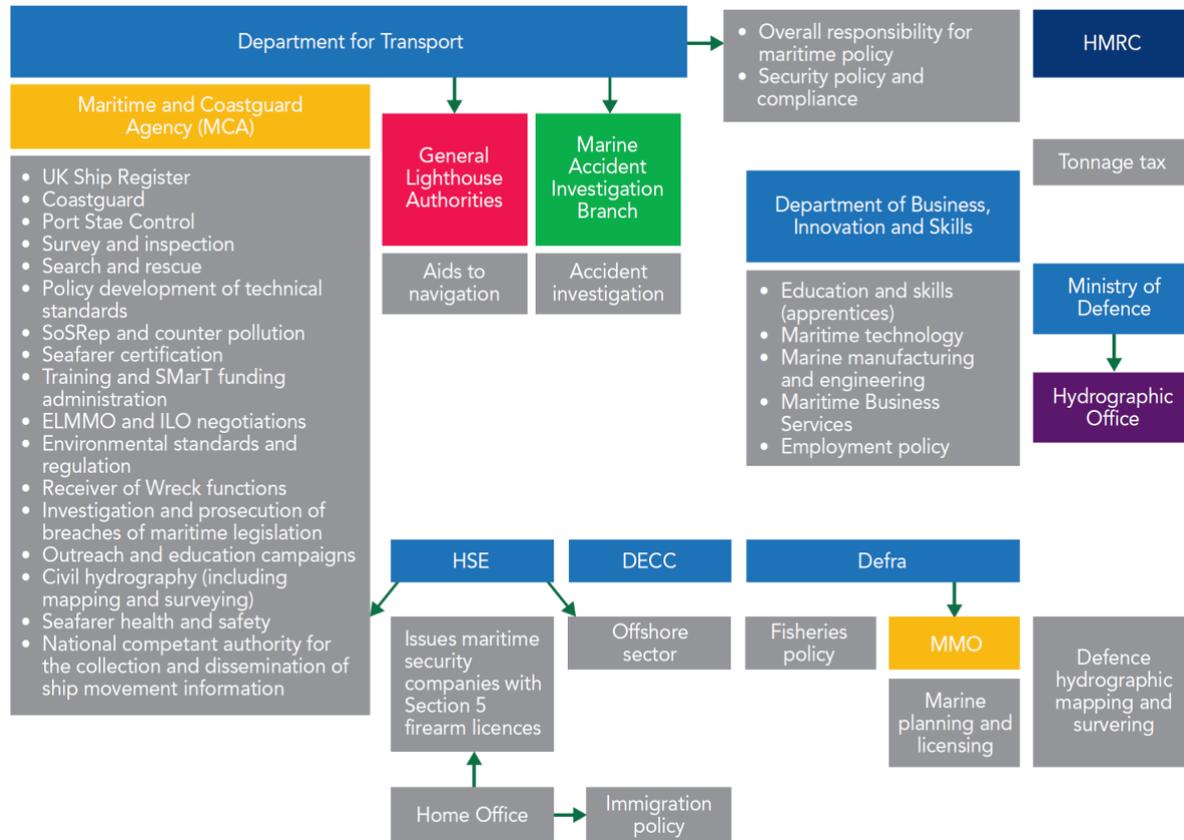
The MAIB is an independent unit within DfT which investigates marine accidents involving UK-flagged vessels worldwide, and all vessels in UK waters. The GLAs are executive non-departmental public bodies responsible for aids to navigation. The Canal & River Trust, formerly British Waterways, is responsible for over 2,000 miles of navigable rivers and canals in England and Wales ¹. In addition, there are several other government departments (OGDs), agencies and public bodies with responsibility for different aspects of maritime policy (see Figure 3). Figure 3 dates from 2015, but since then there have been some changes to government departments, such as the amalgamation of DECC and BIS into one department (BEIS), and the introduction of a new department in DEXEU (the department for exiting the European Union), which are not shown in the figure.

Transport Scotland has established a directorate for ‘Aviation, Maritime, Freight & Canals’ (Transport Scotland 2017c). The directorate works within UK policy framework and legislation, tenders subsidised ferry services, and issues small freight mode shift grants. Two state-owned entities overseen by the directorate are ferry operator Caledonian MacBrayne and port and ferry owner CMAL (Caledonian Maritime Assets Ltd) (see below). The directorate administers provisions outlined in the Harbours, Pilotage and Ports Acts, as well as any related local legislation, deals with applications for Harbour Empowerment and Revision Orders within Scotland, and liaises with the UK Marine Management Organisation on issues of common interest. There is no distinct ‘Scottish’ maritime policy as such in terms of ensuring

¹ <https://canalrivertrust.org.uk/>

adequate seaport and shipping capacity to serve the needs of the Scottish economy (Nicholls, 2017).

Figure 3: UK Government Maritime Structure (source: Department for Transport, 2015)



The **Welsh Assembly Government** notes that policy and regulation of most ports in Wales is the responsibility of the UK Government². Part of this was devolved to Welsh Ministers from April 2018, notably powers to issue Harbour Revision Orders as in Scotland. Major ports in Wales as in the rest of UK are mostly privately owned with the remainder owned by self-governing trusts. The Welsh Ports Group is the only forum representing the views of the maritime sector in Wales. Coordinated by the British Ports Association and the UK Major Ports Group, it holds regular meetings with the Welsh Government and key decision-makers across the planning, transport, and maritime sectors. Any major transport initiatives must be appraised using the WeITAG guidance (Welsh Government, 2017a) at the planning stage, to ensure they consider the economy, environment and society.

Sub-national transport bodies have very little influence over shipping with the exception of **Transport for London** which deals with Thames Clippers and the **Highlands and Islands Regional Transport Partnership** in Scotland which works with the local authorities who procure the services. Local Government acts as the

² <http://gov.wales/topics/transport/ports/?lang=en>

planning authority for ports situated in their area. The key issues of concern surrounding port projects usually relate to:

- national/regional/county planning policy;
- ports policy (supply/demand and alternative sites);
- employment;
- transportation (public/private transport arrangements and road/rail freight implications);
- landscape/ecology; and
- historic environment (Essex County Council, 2002).

However, ultimately the decision concerning a Harbour Order is made at national/ministerial level. Many local authorities throughout the UK also own ports and harbours. This includes one of the largest ferry ports - Portsmouth. However most LA-owned facilities comprise relatively small harbours. In Scotland, a few local authorities do own a significant number of ports and piers, mainly used by ferries and for fisheries, and some maintain significant maritime assets and services, such as in Orkney and Shetland, which have marine departments within the respective council structures (Orkney Islands Council, 2018).

Individual statutory harbour authorities (of which there are several hundred in the UK) regulate port and shipping activities and operations within their defined areas of jurisdiction. Many of the latter are now privately owned such as the major estuary regulating bodies for the Solent, Humber, Mersey, Tees, Forth, Clyde and Tay. There are some anomalies, as non-port-owning regulatory trusts continue to operate at Harwich Haven and on the Thames.

Privatisation can occur in three areas for port operation. This can cover (i) the ownership of the land, or just assets such as terminals, (ii) the cargo handling functions or (iii) the regulation of the port or waterway. The first two types of privatisation are common in ports across Europe. Transferring port (authority) regulatory functions (as well as port land property rights) to the private sector made UK governance of ports significantly different from most other countries where such responsibilities are generally retained within the public sector (Baird, 1995).

UK ports are today predominantly owned by private port companies/groups; nine port operators between them own and operate over 40 ports, accounting for more than 70% of the total tonnage handled in UK ports (UKMPG, 2018). Self-governing trust ports account for much of the remaining tonnage, with the balance handled by smaller private and local authority owned ports. The largest publicly-owned shipping operator in the UK is Caledonian MacBrayne (n.d.) which operates 27 ferry routes in the Clyde and Hebrides. Its main port supplier and ship provider is publicly-owned CMAL (Caledonian Maritime Assets Ltd) which owns and operates the fleet of 32 ferries and is Statutory Harbour Authority for 16 ports, harbours and

slipways across the West of Scotland and the Clyde Estuary (CMAL, 2018). Both organisations are owned by Scottish Ministers.

UK ports are predominantly self-governing and responsible for their own planning, development and investment (Monios 2017). Consequently the UK Government does not invest in standalone port infrastructure as this is a matter for the individual private owners. The recently completed ports connectivity study highlights the importance of and need for enabling inland infrastructure (DfT, 2018a). Of the £20 billion annual DfT spend on transport in 2014/15, 97% went to road and rail, with only 3% (some £600 million) left to support 'other' modes (i.e. maritime, aviation and other). Any enabling investments, such as roads to / from ports are recorded in the roads budget, not the maritime one.

In 2016/17 the devolved Scottish Government spent more on maritime transport (i.e. ferries and their piers) than DfT spent for the UK. This is because the geography of Scotland is such that lifeline ferries are needed for its island communities, in ways not mirrored in the rest of the UK. In 2016/2017 this amounted to £208 million (£167 million for ferry operating subsidy and £41 million for capital spend), compared with £201 million in 2015/2016 (Auditor General 2017).

3.3. Rail

The national rail network of Great Britain comprises 15,799 route-km, and currently carries around 65 billion passenger-km and 18 billion tonne-km per annum (TSGB 2016). It should be noted that the arrangements relating to the small rail network in Northern Ireland are totally different from those of the rest of the UK. Northern Ireland Railway has a route length of 362km and carries around 400 million passenger-km annually and is not covered further in the main report. Key actors at different tiers are shown in Figure 4. By contrast to aviation and maritime, where global and European influences are very strong, the UK Government and national actors are more important to the rail industry.



Figure 4: Simplified Mapping of Key Actors by Governance Tier in Rail

The European Union intervenes extensively in the rail sector, most notably through its four railway packages of Directives, which require amongst other things:

- Access to the rail network by all licensed freight and international passenger operators (from 2020 this will be extended to domestic passenger)
- From 2022, competitive tendering for public service contracts
- Creation of an independent regulator to ensure non-discrimination in pricing track access and allocation of capacity

- Arrangements, either through regulation or multi-annual contracts with the government, to bring pressure on the infrastructure manager to reduce costs and charges while ensuring that an efficient infrastructure manager is able to finance its activities
- Following standard European Technical Standards for Interoperability in all investments (although because of its particular situation as an island with only two direct rail links with other EU member states the UK has negotiated derogation from some of these provisions).

Except for those relating to interoperability, these provisions have had little influence in Britain, because Britain was generally already complying with them before the legislation was passed. The EU also contributes funding towards the planning and execution of rail projects on the designated trans-European rail network, although for Western European countries the proportion of cost contributed is generally small.

Figure 5 shows an overview of the rail industry and the key actors involved. The national rail network (including not just track, structures and signalling but also stations and many maintenance facilities and freight terminals) is owned, maintained and operated by Network Rail. The only significant exception is the high-speed line from London to the Channel Tunnel, which is privately owned although still maintained and operated by Network Rail. Until 2014, Network Rail was regarded as a private sector company limited by guarantee, with members including the government, train operators and general representatives of the public. However, in that year the Office of National Statistics ruled that, as its debts were guaranteed by the government, Network Rail should be regarded as a government-owned company.

This has led to significant changes in the institutional structure. Prior to 2014, Network Rail was regulated by the Office of Rail Regulation (since renamed the Office of Rail and Road (ORR)) and borrowed on the open market, with government guarantee. Now, although ORR continues to have significant regulatory responsibilities for Network Rail, it is also monitored and supervised directly by the Department for Transport and is only allowed to borrow from the government, which itself sets borrowing limits (Bowe, 2015). DfT now approves and monitors enhancement projects directly rather than through the periodic review, taking account of advice from the National Infrastructure Commission. Other bodies may contribute to investment costs; for instance train operators, local enterprise partnerships and the Welsh Assembly. For some very large investments (HS2, Crossrail and East-West Rail) separate companies have been set up to plan and deliver them.

An overview of the rail industry

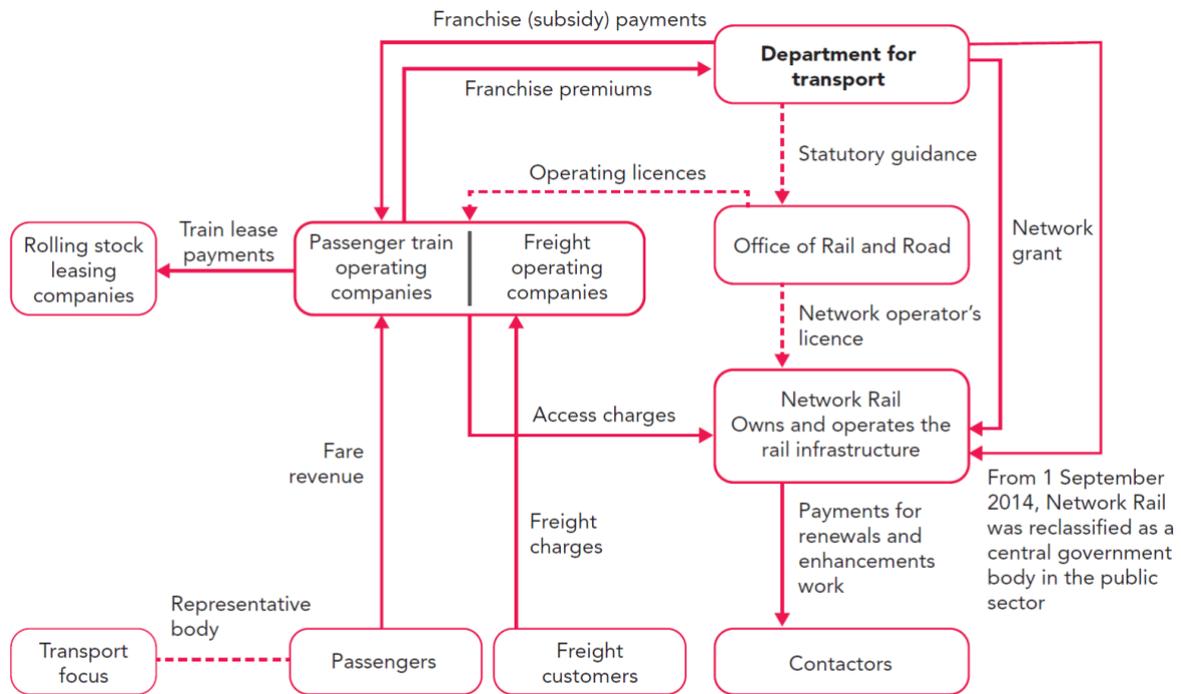


Figure 5: Overview of the Rail Industry (NAO, 2015)

Responsibility for both franchising and infrastructure spending in **Scotland** is now devolved to the Scottish Government. There is currently no such arrangement in **Wales**; although the Welsh Assembly does play a major role in specifying services and managing the franchise, DfT remains the franchising authority (Champion, 2016a). However, it is intended that the next franchise for Welsh passenger services will be fully devolved to the Welsh Assembly and will include control of and investment in infrastructure on the Welsh Valleys commuter lines near Cardiff. Otherwise, the Welsh government sets out its priorities and prepares business plans for rail infrastructure investment but largely in an advisory capacity (Champion, 2016b). The Welsh Assembly does have powers to invest in rail infrastructure which it uses on a relatively small scale (for instance to improve stations).

Sub-national government has a varied role in rail planning. Rail North, has also been set up to work jointly with DfT as being responsible for specifying, awarding and managing rail franchises in the North of England. Rail North is now being merged into Transport for the North (discussed in section 4.2.1). Passenger franchises in London and Merseyside have been fully devolved to Transport for London and Merseyside Combined Authority respectively, but this does not include responsibility for infrastructure. In all metropolitan areas, Passenger Transport Authorities or their equivalent are responsible for producing local transport plans, as are county councils elsewhere, and these may make recommendations regarding rail infrastructure. Local government (and LEPs through the capital budgets they hold) play a part in financing small rail infrastructure projects such as new stations.

The national rail regulatory body is **ORR** which is responsible for monitoring the performance of Network Rail, enforcing licence conditions and determining Network Rail funding and required outputs through the periodic review. Regulation is divided into five year control periods. Each control period starts with DfT publishing a statement of funds available (SOFA) and a High Level Output Specification (HLOS), while the Rail Delivery Group RDG publishes an Initial Industry Plan (IIP) and Network Rail a schedule of proposed Track Access Charges. It is the responsibility of ORR to consider these documents, to check their consistency and to produce a settlement which determines Network Rail regulatory outputs, charges and other funding. In doing this, it is required to regard the SOFA as binding, so that required outputs must be adjusted to fit the funds available.

In the current periodic review, due for completion in 2018 (PR18), the process has changed substantially, in that the HLOS only covers requirements concerning maintenance, renewals and operations, and not enhancement. Enhancement projects will be considered by DfT as and when they are fully specified and the business case completed. This is in response to problems in the last periodic review, when a number of projects were added in before they had been fully prepared, and this led to substantial overspending on budget (Bowe, 2015). But it does represent a substantial shift of control from ORR to DfT.

Passenger trains are operated by private sector train operating companies, mainly under franchises awarded by DfT; freight trains are operated by private companies on a purely commercial basis, as are a small number of open access passenger services. In general, train operators are not directly involved in providing and maintaining infrastructure, although they do sometimes contribute directly to investment costs and this is a development likely to be encouraged in the future (Hansford, 2017). Passenger operators do lease passenger stations and maintenance depots, and undertake some investment in passenger facilities, car parks etc. and freight operators often own freight terminals, while some other freight and maintenance depots are privately owned. In general, investment in freight terminals is a private sector activity, although obviously subject to the planning process and sometimes in receipt of government grants where they are deemed to provide social benefits in terms of reduced congestion and environmental impact by diverting traffic from roads.

Transport Focus is the body formally required to examine rail industry performance from the point of view of consumers and to conduct a rolling survey of quality of service and passenger satisfaction as well as hearing complaints. It is a non-departmental public body sponsored by DfT.

The flows of income and expenditure in the rail industry are shown in Figure 6.

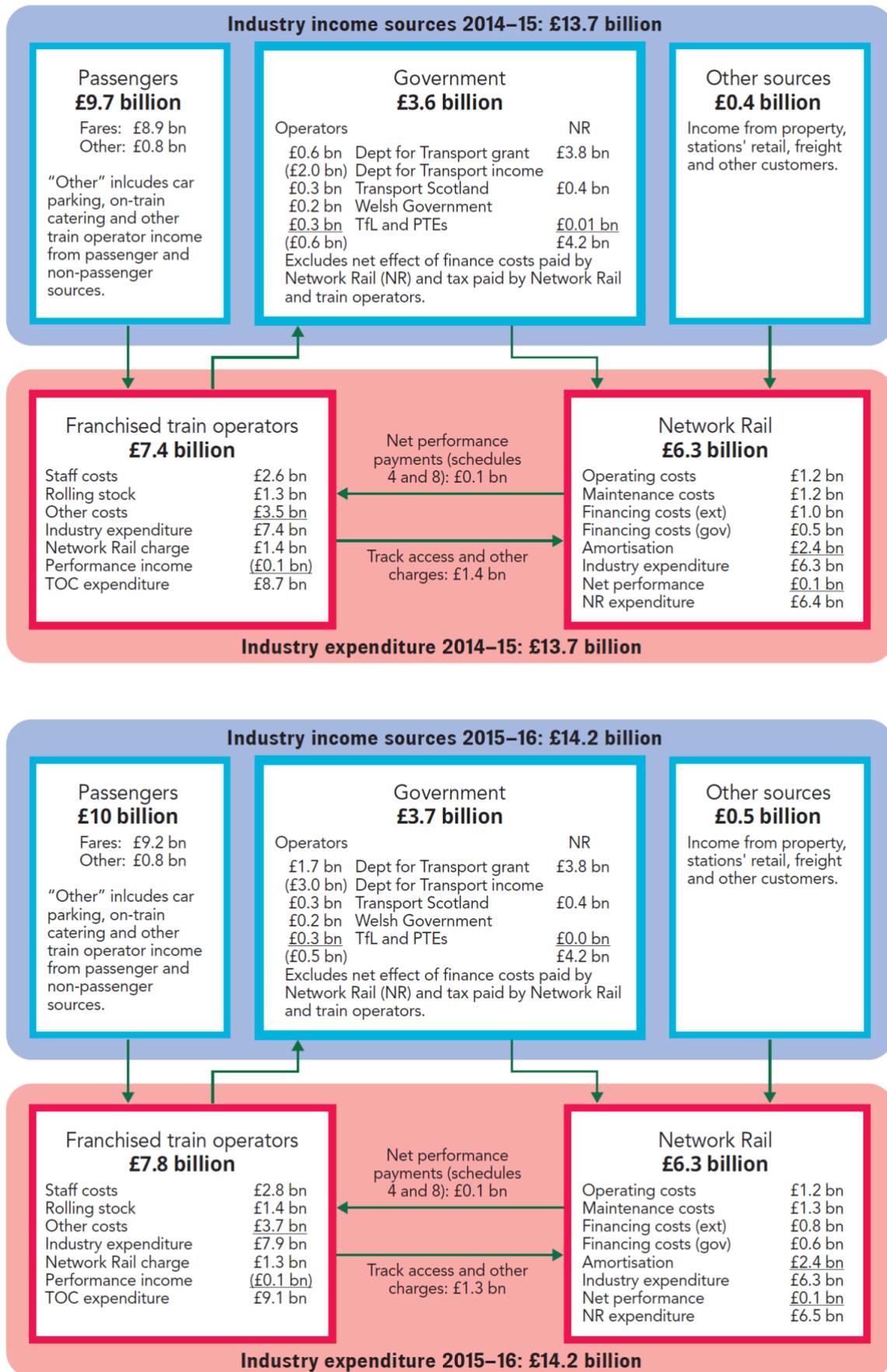


Figure 6: Rail Industry Income and Expenditure (ORR, 2017a)

3.4. Road

A simplified structure of the key governance actors by tier is shown in Figure 7. European funding for the Trans-European Network has generally been a small contribution to investments. The European Union has had a more important role in the setting of emission standards and harmonising new technology standards which could be important for increasingly autonomous vehicles. It also plays a role in the freight industry on matters such as working time, but these are covered in section 3.6 of this report. This section focuses on **road infrastructure investment and management**.

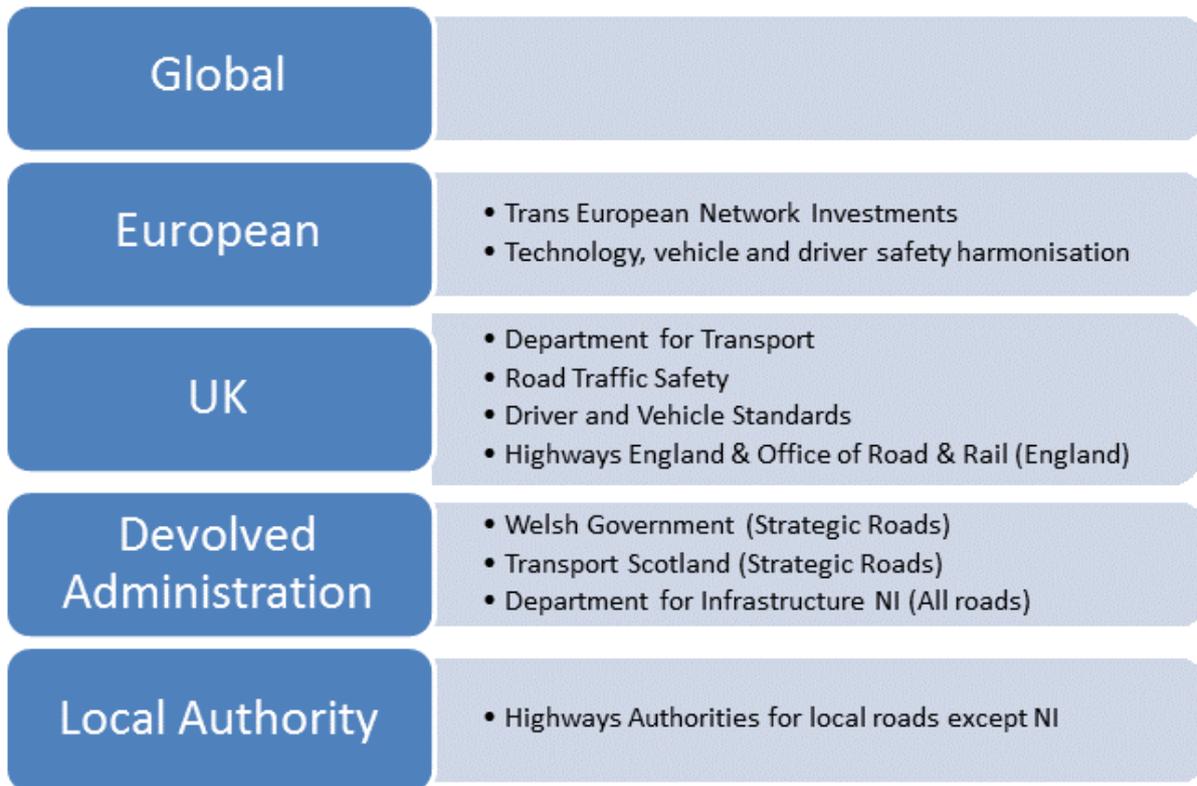


Figure 7: Simplified Mapping of Key Actors by Governance Tier in Road

In Great Britain the ownership and management of roads is divided into two:

1. **Strategic roads**, which cover motorways and ‘trunk’ roads. Trunk roads are roads which are classed as strategic routes. These are owned and managed by Highways England in England, Transport Scotland in Scotland and the Welsh Government in Wales.
2. **Local roads**, which cover the remaining roads in public ownership. They are owned and managed by Local Authorities in England, Scotland and Wales.

In Northern Ireland ownership and management of all public roads falls to the Department for Infrastructure.

Table 2: Road Lengths by Country and Road Type

Nation	Strategic Road Length (kms)	Local Road length (kms)	Total
England	7,100	296,300	303,400
Scotland	3,200	56,100	59,400
Wales	1,700	32,200	33,900
Northern Ireland	1,200	24,400	25,600

Source: DfT (2017a) and DfI (2017, 2014) for Northern Ireland

In terms of strategic roads there is a distinction between England, where Highways England is a separate government-owned company and Wales and Scotland where strategic roads are managed by a government agency. Thus, in England the Strategic Roads infrastructure manager is at arm’s length from central government. This in turn gives rise to the need for more involved governance structures as shown in Figure 8.

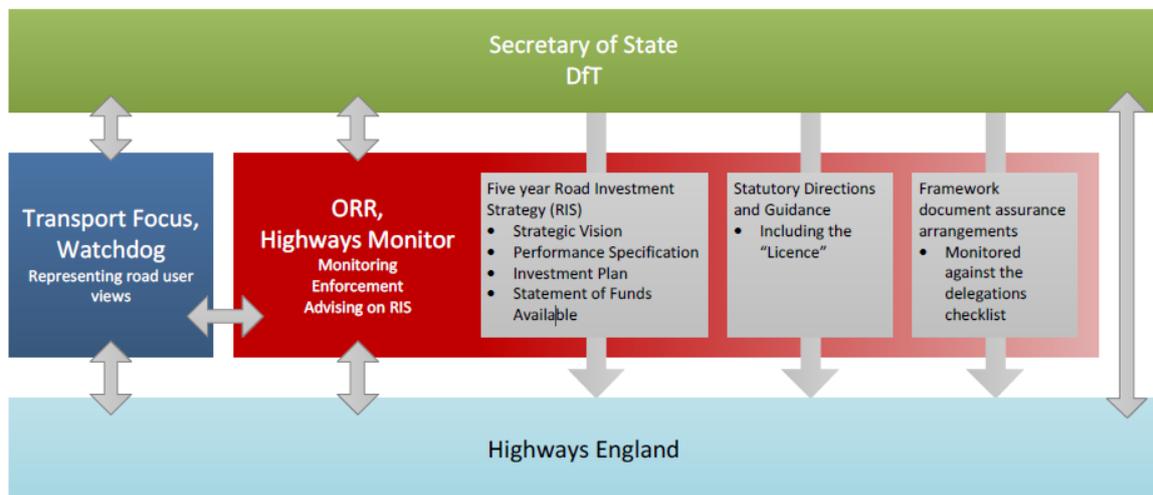


Figure 8: Governance arrangements for Highways England (source: Office of Rail and Road (2017b))

In England, the **Department for Transport** ‘sets the government’s strategic goals for the road network; approves the five-yearly Road Investment Strategy, and holds Highways England’s Board to account for its governance of the Company and its delivery of the strategy.’ (NAO, 2017). The Road Investment Strategy is the process by which the maintenance and investment plans of Highways England for a five-year period are approved by the Secretary of State for Transport. The process is similar to that in rail in the sense that there is an interplay between the infrastructure manager who proposes plans (see section 3.4), the Department for Transport which funds plans and the Highways Monitor which advises the Secretary of State on the viability of the plans.

The Office of Rail and Road has a function of Highways Monitor. It has to:

- Monitor performance against the investment plan, performance specification and other benchmarks
- Advise the Secretary of State on the development of the Road Investment Strategy including what efficiencies could be anticipated
- Require improvements and potentially levy fines for delivery problems (ORR, 2017b).

As such, the Highways Monitor is not an economic regulator. It has limited powers and primarily operates as an advisor to the Secretary of State. However, to discharge this advisory role it has to undertake similar exercises, such as performance benchmarking, as it would if it was as an independent economic regulator.

There is no directly equivalent body for Scotland and Wales given the agency structure. Both the Welsh Audit Office and Audit Scotland do have a general oversight role of government spending in the respective jurisdictions. Transport Scotland has a long-term strategic plan and major scheme prioritisation process (see section 4.2.2 and [Technical Annex](#) section 2.1).

Sub-national bodies have an even more limited role in road than in rail. Transport for the North is involved in conducting some road investment studies in an advisory capacity. Only Transport for London has its own Strategic Road Network, with local roads managed by the London boroughs.

Local roads are maintained and operated by Local Authorities with highway powers. There are 152 in England, 32 in Scotland and 22 in Wales. Such LAs have a legal duty to maintain the highway under section 41 of the Highways Act 1980. To help discharge this duty there are standards of repair that they must follow. For local highway authorities these are set out in *Well-maintained Highways: Code of Practice for Highway Maintenance Management*, published in July 2005 by the UK Roads Liaison Group (UKRLG, 2005). While not a statutory document, it is published with the backing of central and local government (UK Parliament, 2016).

In addition to Highways England, companies are involved in the provision of maintenance and investment on both the strategic and local road network. Local authorities operate a mix of maintenance delivery models ranging from in-house provision to Private Finance Initiatives (PFIs) (e.g. Sheffield with Amey). The network of Highways England is divided into 12 Contract Areas, operating Managing Agent Contracts (MACs). Further, approximately 15% of the Strategic Road Network in England is provided via a range of private Design, Build, Finance, and Operate (DBFO) concessionaires. An example is the M1/A1 link road (now part of the M1 J43-47) and the M6 Toll Road. These contracts are typically concession's lasting 25-30 years.

Figure 9 and Figure 10 show the **spend per mile** on strategic roads and local roads by administration and by region of England for local roads. The spend per mile is at least ten times higher on strategic roads for England, Scotland and Wales, but is comparable to spending on local roads for Northern Ireland.

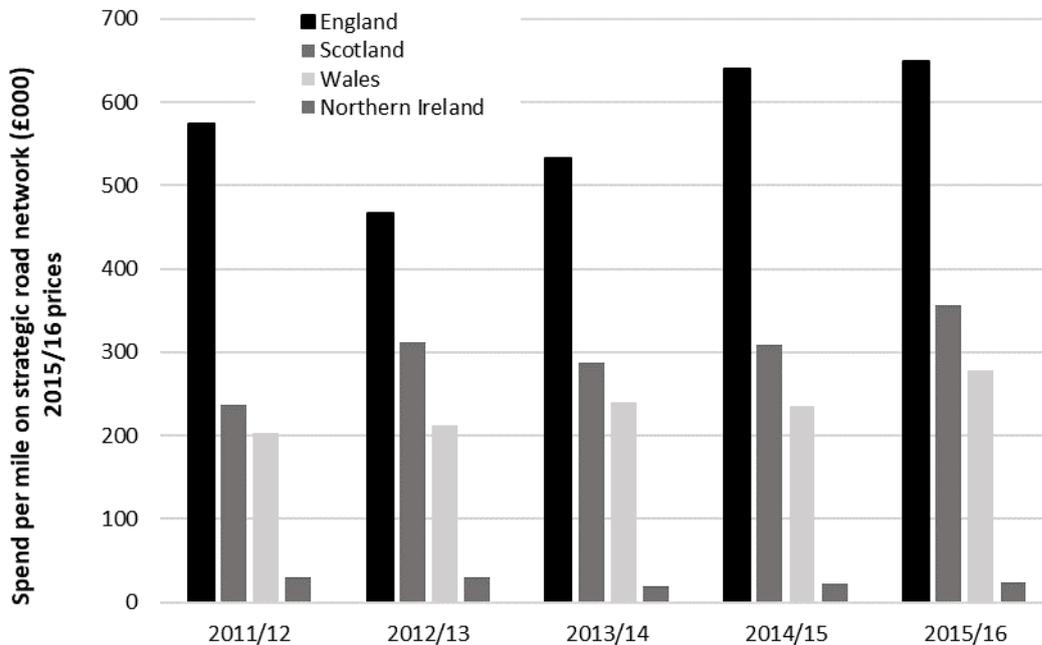


Figure 9: Strategic road spend per road mile for strategic roads (£'000). (Source: HMT Country and regional analysis: 2017)

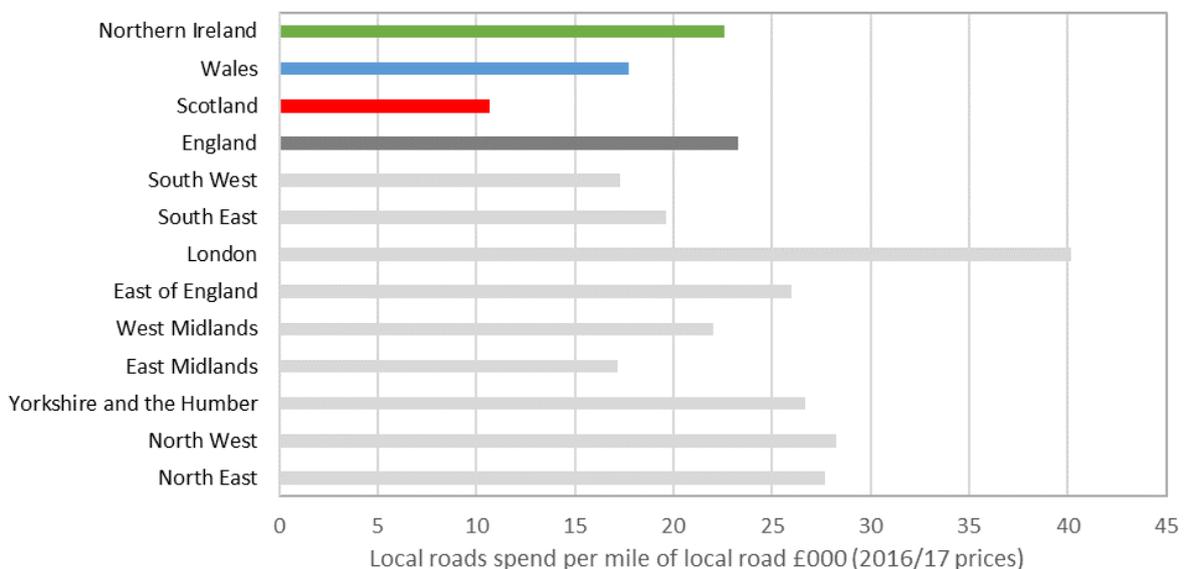


Figure 10: Local road spend per mile 2016/17 (£'000). (Source: HMT Country and regional analysis: 2017)

Spending on capital projects, rather than maintenance, for Highways England, is anticipated to increase from just above £1 billion per annum in 2012/13 to near £4 billion per annum by 2020/21 (NAO, 2015). The challenge of managing such a step

change in delivery in an efficient manner has been highlighted by the National Audit Office (NAO, 2015).

A variety of sources are used to fund local roads. One of the key issues is that **much of the funding is not ring-fenced for spending on transport** (Table 3) and there are concerns over the extent to which this is contributing to a backlog of local road maintenance given other local spending pressures. Industry figures estimate the total backlog at £12.06 billion. They estimate the size of backlog is growing; this year the shortfall was £730 million (AIA,2017).

Table 3: Funding sources for local road expenditure in England (Based on Mayat (2017) analysis of Kemp (2017) and personal correspondence with DfT)

Fund Name	Description	How allocated	Ring-fenced for highways?
Integrated Transport Block	For small transport improvement projects	Formula	No
Highways Maintenance Needs Fund	To maintain local road network	Formula	No
Highways Maintenance Incentive Fund	Additional maintenance funding based on efficiency improvement self-assessment	Formula	No
Highways Maintenance Challenge Fund	For projects not possible to complete with Highways Maintenance Needs Fund	Bidding process	No
Local Growth Fund	For infrastructure to support Local Enterprise Partnerships' (LEPs) plans to deliver growth	Bidding process	No
Pothole Action Fund	To repair potholes on local roads	Formula	Yes
NPIF	Focus on housing growth and removing barriers to productivity growth	Bidding process	No
Safer Roads NPIF	To make the 50 most dangerous sections of the local road network safer	Targeted funding	No
Resilient Roads	To repair flood damaged roads and to make the network more resilient	Targeted funding	No

3.5. Bus

The bus and coach industry serves a wide range of functions, notably:

1. Provision of 'local' bus services, i.e. those corresponding to the general concept of 'buses', calling at closely-spaced kerbside stops, handling mostly short-distance passenger movement. Each passenger pays a separate fare (although not necessarily in cash; could be by smartcard or display of a pass).
2. Operation of contract services, where the entire vehicle is hired out to an individual or organisation, and separate fares are not collected from passengers. The principal example is school travel, in which local authorities meet their statutory obligations to provide free travel above specified distances by hiring- in vehicles from licensed operators.
3. Excursions and tours.
4. Express services. Where all passengers are carried a distance of at least 15 miles measured in a straight line, no service registration is required, but a fixed timetable is usually operated. Separate fares are charged for each passenger.

This section focuses largely on 'local' bus services. Around 5,000 million trips are made per year on such services. Such services must be registered with the regional Traffic Commissioners. Most services outside London and Northern Ireland (about 84% of bus-km in 2015-16) are registered 'commercially' (see below), the balance being on contracted services. A simplified map of actors by tier of governance is shown below in Figure 11.

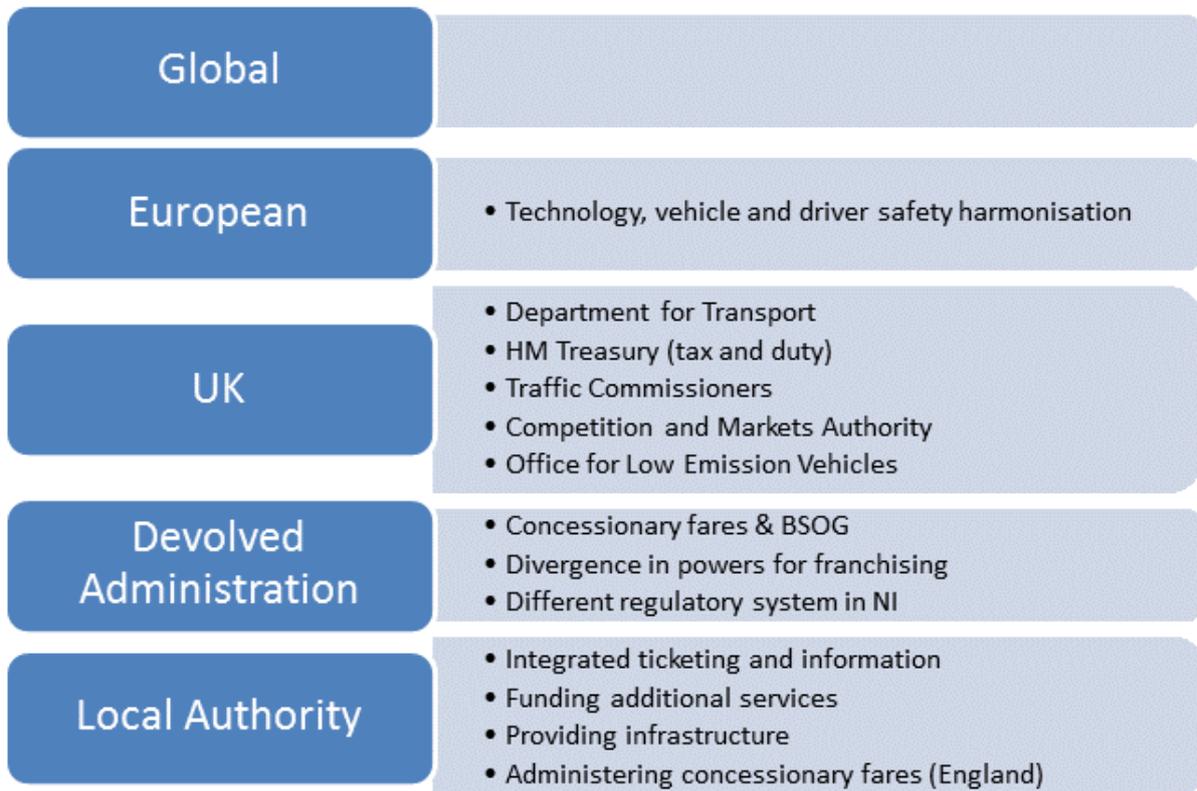


Figure 11: Simplified Mapping of Key Actors by Governance Tier in Bus

The EU provides a number of common regulations, in particular those affecting environmental standards for new vehicles (currently Euro VI), rules affecting drivers' hours of work (for services whose length exceeds 50 km), and the operator licensing system, notably in respect of financial resources per vehicle. It also provides a framework for international services, and competitive tendering. However, member states vary greatly in the degree of quantity and price regulation for local buses, and whether to permit scheduled express coach services.

The **UK Government** provides most of the statutory framework for the industry and other tiers of government. In the absence of a separate English administration, it also exercises power directly in that case. Given the limited ability of local government to raise finance directly, its financial resources are also determined to a large extent through grants made from the UK central government revenues. This has even applied historically to the devolved national governments, although they now have wider tax-raising powers. The UK Government also sets taxes applicable to bus and coach operations (fuel duty, vehicle excise duty).

The legislative framework for the bus and coach sector is set by central governments, principally that in Westminster, but also those in Cardiff and Edinburgh. Education legislation is of particular importance, requiring local education authorities to provide free transport above specified distances between home and the nearest suitable school (two miles up to age eight, three miles above this). This forms a large part of the transport-related expenditure for rural authorities, and of

income to operators in such areas. Central legislation also requires local authorities to provide free concessionary travel for disabled users, and to those in older age groups. The age eligibility and compensation mechanisms and rates differ between England, Scotland and Wales.

At present, the legislative framework within **Wales and Scotland** is similar to that in England, but more variation is likely to emerge, as the Bus Services Act 2017 is largely applicable only within England. Differences in concessionary fares and bus operator grants are discussed below.

At present, the main exceptions to the broad patterns described are London and Northern Ireland. Within **London**, while the operator licensing system applies (see below), Transport for London (TfL) procure the great majority of services through contracts with operators, and also acts as regulatory authority for the others, through issue of London Service Permits. Within **Northern Ireland**, a very different structure from the rest of the UK applies, with a more restrictive licensing system (even for express services) and most scheduled services are provided by publicly-owned near-monopolies.

Within **England**, the principal bus roles are the county level in two-tier authorities, but where unitary authorities exist they have these responsibilities, which can create some co-ordination issues. Within the six metropolitan areas outside London (such as the West Midlands, focussed on Birmingham) wider powers were given by the Local Transport Act 2008, the Passenger Transport Authorities (PTAs) being renamed Integrated Transport Authorities (ITAs). Other sub-national decision-making bodies have limited influence. In addition to the direct powers and responsibilities related to bus services described above, local authorities also have considerable influence on other issues likely to affect bus performance, in particular in their role as highway and traffic management bodies, and in relation to parking policy and provision of bus priorities.

Discretionary powers exist for support of non-commercial local bus services through tendering, but there is no particular service level stipulated. In practice, given the pressures of mandatory spending on school travel and concessionary fares, some authorities have eliminated such spending altogether (e.g. Cumbria, Oxfordshire, Southend). Overall tendered bus-km in Britain outside London fell from a peak of 514 million in 2009/10, to 310 million in 2015/16 (i.e. by 40%). 'Commercial' bus-km rose marginally from 1,627 to 1,650 million over the same period³.

Regulation in the bus industry largely relates to the quality (especially safety) of services, as distinct from 'quantity' regulation (limiting the total scale of operation, usually by route licensing) and price regulation – these last two aspects were largely abolished outside London and Northern Ireland under the Transport Act 1985. Each

³ DfT Table BUS0205b 'Vehicle kilometres on local bus services by metropolitan area status and country, and service type: Great Britain, annual from 1987/88

Public Service Vehicle (PSV) operator, i.e. of bus and coach service vehicles, is required to hold an ‘Operator Licence’ (or ‘O-licence’). This is awarded to an operator deemed fit to run a specified number of vehicles by the regional Traffic Commissioner. For this purpose, Wales⁴ and Scotland each have their own Commissioner, while England is divided into several regions. The licence specifies the number of vehicles permitted to be operated at any one time (by issue of discs), determined primarily by the operator’s ability to safely maintain their fleet. There are also financial requirements (working capital per vehicle) imposed by EU regulations. The Commissioner may vary the number of discs, or cancel a licence entirely where operation is unsatisfactory.

In recent years, the Commissioners have also placed increased emphasis on operators running according to their service registrations, as reliability is a very important consideration from the passenger’s viewpoint. The expected standard is generally set that at least 95% of journeys should run not more than 1 minute earlier or 5 minutes late, although discretion may be exercised in applying this (Forster, 2015). A Commissioner may impose a penalty per vehicle operated.

The Competition and Markets Authority, which replaced the former Competition Commission, and the Office of Fair Trading, applies competition policy to the bus and coach industry within Britain. It has a particular role in determining whether agreements relating to fares and ticketing might be deemed anti-competitive, and also has powers to investigate mergers and other forms of anti-competitive behaviour.

The great majority of the industry in mainland Britain is in private ownership.

This has always been the case for the contract and private hire market, but public sector operators dominated in the scheduled local and express services prior to 1985. Ten local authority-owned urban operations continue in business as ‘arm’s length’ companies. Creation of further such operations in England is specifically prohibited under the Bus Services Act 2017. There are also some small local authority-owned operations for specialised school and/or rural services.

Within the private sector, **five groups dominate the market** (Stagecoach, First, Go Ahead, National Express, Arriva), comprising about 70% of local bus turnover. The first four of these are PLCs on the UK stock market. There are some other substantial regional companies, two of which may be traced back to management buy-outs of National Bus Company subsidiaries, but most of the ‘independent’ private sector operators are relatively small, with a large number running under ten (see [Technical Annex](#)).

⁴ A useful illustration of the role of a Commissioner may be found in the commentary from Nick Jones, the Traffic Commissioner for Wales, in Bus Users Cymru 2016-17, Annual report on activities, achievements and progress, pp 34-36

The most comprehensive statutory representation within England is that provided by **London TravelWatch**, covering all modes of public transport within the Greater London area, also including taxis. Transport Focus provides a body for representing bus user interests outside London, and has a particularly important role in carrying out regular large-scale surveys of user satisfaction by bus in many areas (now also extended to Scotland). These may have influenced operators' policies, for example, in respect of fare levels (White, 2017). At a local level, many issues are dealt with directly by operators themselves, with **Bus Users UK** acting as a non-statutory body in representing their interests. A Bus Appeals Board acts a point of appeal where users are not satisfied with responses by operators to complaints.

Substantial funding for buses with reduced emissions has been provided through the **Green Bus funds**, both in England and Scotland (there is no equivalent scheme in Wales). This has included, for example, the difference in cost between conventional diesel vehicles and diesel-electric hybrids (which would not be justified on commercial grounds by operators) and also buses powered by natural gas, and retrofitting of older vehicles to meet later 'Euro' standards. For example, the latest round of Low Emission Bus fund funded 479 buses, split between hydrogen, bio-gas, hybrid and fully electric technologies. In a previous round of the Clean Bus Technology Fund, grants were given to retrofit 439 buses to reduce nitrogen oxide emissions (Coach and Bus Week, 2016, p. 7).

While some public spending is provided for infrastructure (such as busways) most of that for bus services is in the form of current spending. Stemming from the former fuel duty rebate, **Bus Service Operators Grant (BSOG)** is paid for local bus services within England. Originally set at a fixed rate per litre of fuel used on local service (80% of the total duty payable) this was restructured to provide incentives for low-carbon buses, smartcard technology and automatic vehicle location. The core grant remains related to fuel usage. Work by KPMG indicates a benefit-cost ratio of up to 3.7 (KPMG, 2017). Within England, all BSOG was originally paid direct to operators. For services in London and tendered services elsewhere, it was diverted to TfL and the equivalent local authorities from the start of 2014 (DfT, 2013), while still being paid direct to operators for commercial services. Equivalent grants in Wales (Bus Services Support Grant) and Scotland operate on a slightly different basis, the latter being a flat rate per bus-km (which tends to favour rural services).

Figure 12 shows that the proportion of income from users as such is generally around 60%, both in London and elsewhere.

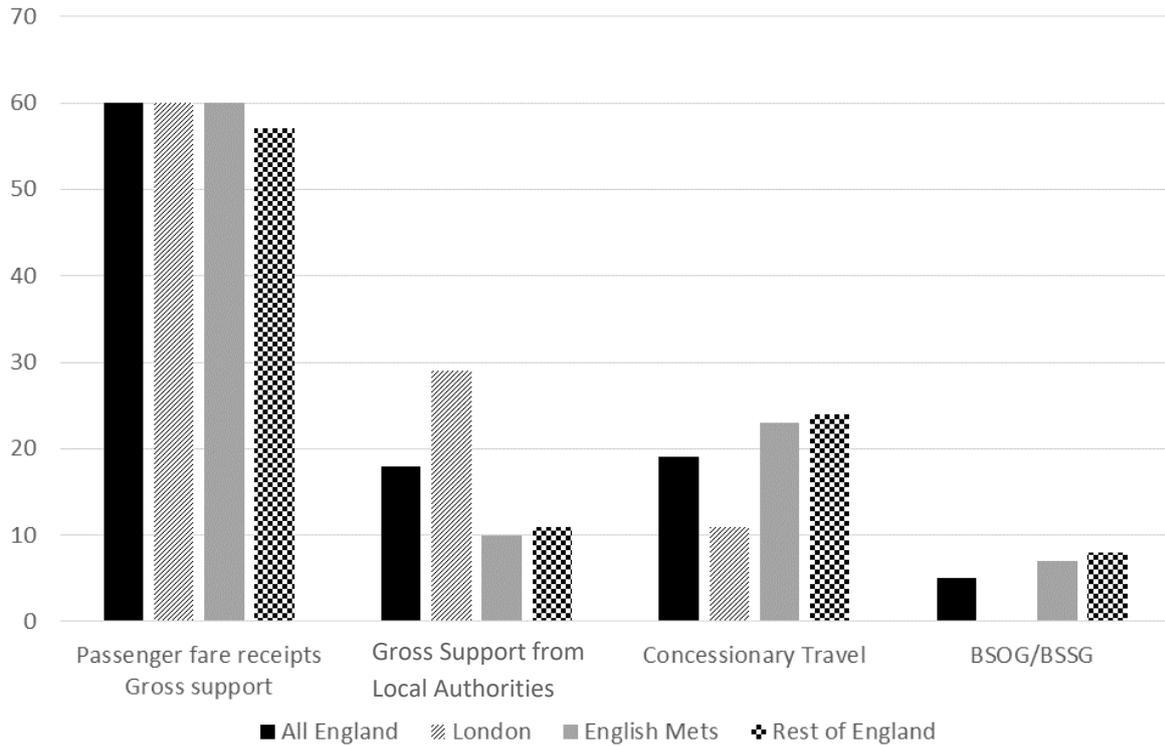


Figure 12: Sources of income for bus operations in England 2015/16 (DfT table BUS0501a)⁵

Major current spending trends in England are summarised below (drawn from DfT Table BUS 0502b). There has been a net decline of £65m and, within that a significant redistribution away from BSOG and support for additional services towards concessionary fares.

- BSOG grew from £379m in 1999/2000 to a peak of £470m in 2009-10, then fell to £254m in 2015-16.
- Concessionary fare compensation rose from £574m to £1049m between 1999/2000 and 2015/16 (i.e. by 77%, but by 249% outside London and Metropolitan areas⁵ and the growth in provision and use was most marked). Free bus travel for over 60s throughout Wales, and Scotland was introduced in 2002, within authorities in England 2006, and throughout England since

⁵ In figure 12, Gross Support from Local Authorities is the total of all local authorities' gross costs incurred in support of bus services, either directly or by subsidies to operators or individuals. The bulk of these costs will be accounted for by payments to operators providing tendered or supported bus services, but some other costs, for example administration costs, are also included. In figure 12 English Mets refers to the six Combined Authorities. These were the metropolitan areas of Tyne & Wear, Merseyside, Greater Manchester, West Midlands, South Yorkshire and West Yorkshire up to 2014-15. From 2015-16, although Durham, Northumberland and Halton are part of the Combined Authorities, the gross public transport support and concessionary travel figures for metropolitan and non-metropolitan areas have been adjusted to ensure consistency with 2014/15.

2008. Concessions for free travel for older travellers for free bus travel in London has been in place since the early 1970s.

- Local net support payments grew from £313 million to £899 million (+187% / £586m), peaking at £1,224 million in 2008/09. This growth of £586 million was entirely due to substantial increases in London (from a base of £1 million). London peaked at £801 million in 2008/09, falling to £621 million in 2015/16.

In summary, outside of London and Northern Ireland, there is only limited scope for local authorities to steer what they want to achieve through the bus network except through partnership with the private sector operators. In some places (e.g. Reading and Brighton) this has worked well and in others the relationship has been more fractious both between operators and between operators and local authorities. Compared with the position in most European cities, the inability to set fares, routes and frequencies is seen to be a weak governance position.

3.6. Freight

This section covers the operation of freight on the transport infrastructure. A simplified map of actor by tier of governance is shown in Figure 13.

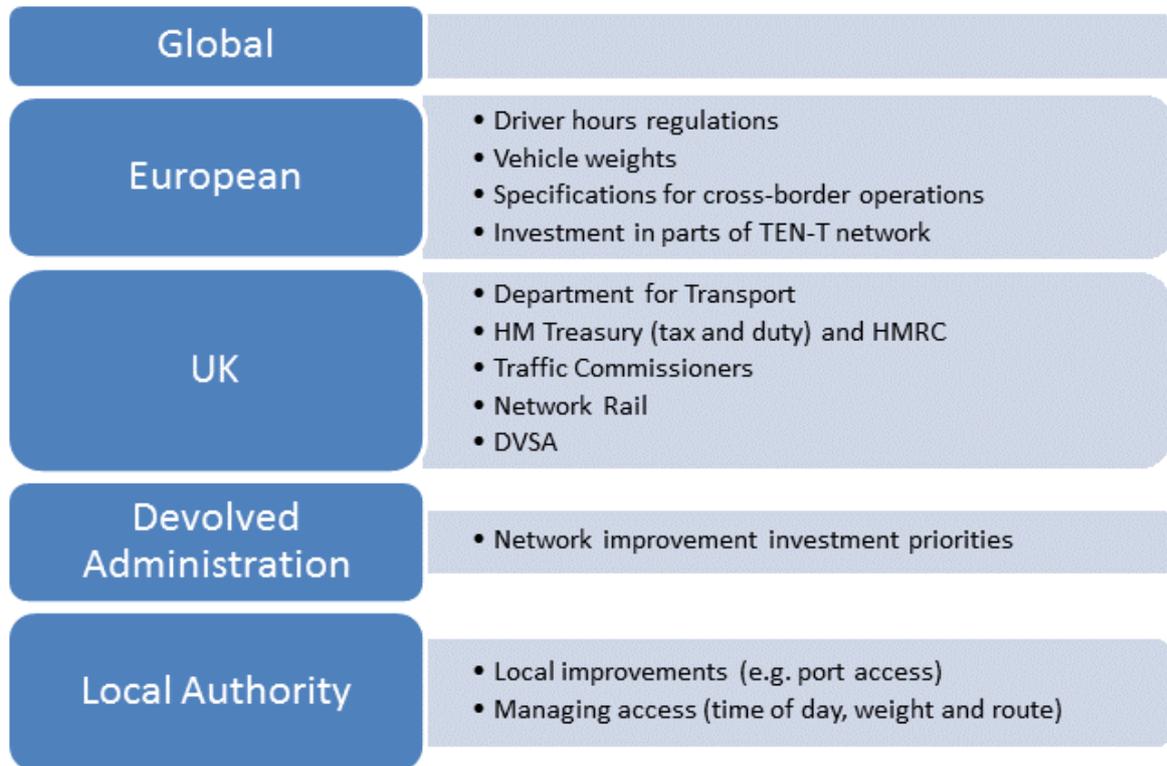


Figure 13: Simplified Mapping of Key Actors by Governance Tier in Freight

EU legislation forms the basis of a considerable amount of UK law relating to freight operations on the transport infrastructure. Because of the important need for interoperability across the UK, the UK Government embodies EU Directives into law, currently for the whole of the UK. Notable examples include lorry driver hours regulations and vehicle weights and specifications for freight vehicles engaged in cross-border operations.

A number of key freight transport corridors within or partly within the UK are designated as part of the EU TEN-T strategic corridor network, and as such have had access to some EU funding for investment. Examples include the A55 North Wales corridor towards Ireland, the A14 corridor towards mainland Europe through east coast ports such as Harwich and Felixstowe and the Anglo-Scottish West Coast rail route.

In the case of rail, both the **Department for Transport** and **Network Rail** have rail freight planning processes which consider capacity and investment issues for the network (DfT, 2016; Network Rail, 2017). The devolved administrations include freight in their national transport strategy documents. Highways England does not appear to have published a specific freight strategy document to date although it

refers to freight and the importance of its investments to long-distance freight as part of its business plan to 2020.

Use of road infrastructure for freight operations is subject to considerable intervention at local authority level. Local authorities, as the highways authorities for their roads, act to impose various restrictions which impact primarily on commercial vehicles, including weight limits in individual streets or localities, restrictions on lorry movements at certain times of day and restrictions on parking, including short-term for collection and delivery. Conversely, local authorities may act to provide dedicated loading bays for freight vehicles. All such actions frequently form part of wider initiatives for environmental improvement or safety, such as pedestrianisation schemes. Strategy development forms part of the Local Transport Plan process in England and Wales and part of the Regional Transport Strategy process in Scotland. London is also required to consider freight policy.

Regulation of the freight industry is undertaken by a combination of bodies. The **Driver and Vehicle Standards Agency (DVSA)** was established in 2014, taking over various functions of the former Vehicle and Operator Services Agency (VOSA). DVSA covers Great Britain, with Northern Ireland having its own Driver and Vehicle Agency. DVSA has responsibility for ensuring that only safely operated and adequately maintained vehicles can legally use the road network. DVSA ensures that vehicles in use are consistent with the legislation on maximum vehicle weights and axle loadings, some of which is established at national rather than supranational level. Public weighbridges exist to support vehicle loading compliance; however, the majority of these are available under arrangement with the private companies that own them.

DVSA also has responsibility for the enforcement of driving hours and vehicle tachograph compliance, the regulations for which are enshrined in EU legislation. It also has responsibility, along with the Health and Safety Executive and the police, for the safe carriage of dangerous goods by road with relevant UK legislation again enacting EU legislation.

Responsibility in Great Britain for the system of commercial vehicle operator licensing rests with the **Traffic Commissioners**. Responsibilities cover not only the fitness of operators to operate, but also the approval of company operating centres. Northern Ireland has a separate system which is part of the Department for Infrastructure.

In addition to pre-existing national taxation relating to road freight movement through fuel duties and vehicle excise duties, since 2014 the UK has operated an HGV Road User Levy system (DfT, 2018b). This is a levy designed to level the playing field inside the UK between UK and foreign road freight operators, while maintaining overall revenue neutrality for UK operators.

Freight vehicles crossing into the UK from Europe suffer from infiltration by illegal immigrants. The policing of this problem in the UK is the responsibility of the **Border Force**, which is part of the Home Office. Other enforcement problems relating to road freight operation include the use of untaxed fuel ('red diesel'). Responsibility in this area rests with **HMRC**.

Unmanned aerial vehicles (UAVs) or 'drones' are increasingly considered as a future means of freight transport, including for 'last mile' home deliveries. Regulations controlling such activities in the face of any significant commercial exploitation are not yet in place, but current law relating to drone use is set out in the 2016 Air Navigation Order. Responsibility for control and regulation of drone activity lies with the Civil Aviation Authority (CAA).

The freight industry is privately owned and operated including depots and warehousing. Grant funding for freight facilities is not currently available in England but it is available for small rail and maritime investments in Scotland and Wales. The relatively large size of lorries and the relatively high axle loadings on lorries means that heavily laden freight routes will have proportionately greater needs for funding for road maintenance, relative to total traffic flow.

3.7. Summary

The institutional structures underpinning transport have, developed around modes and networks and around the industries of transport. The arrangements vary significantly between modes and, increasingly, across areas. There is a multitude of governance networks rather than a single overarching ‘governance of the transport system’. This makes it difficult to achieve integrated outcomes (see Figure 14).

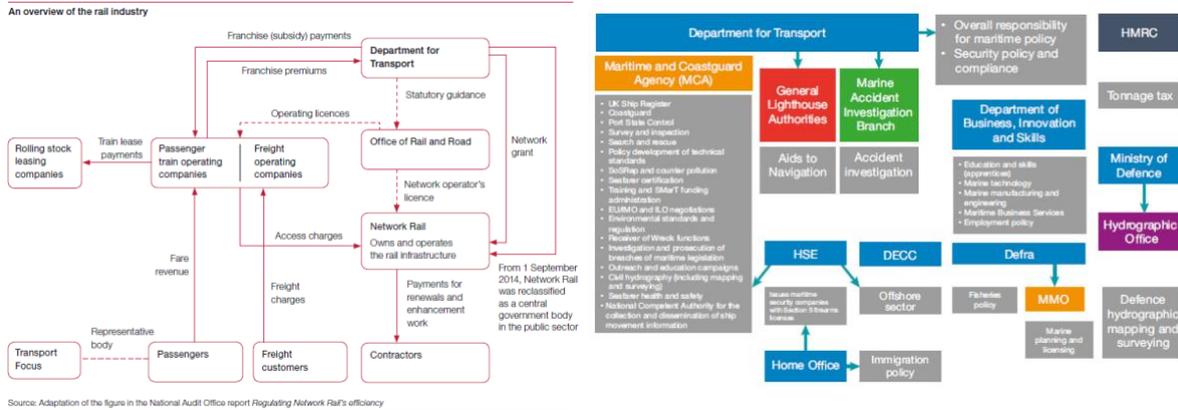


Figure 14: Exemplar Differences in Rail and Maritime Structures

Taking account of the summaries for each mode or network above and the more detailed information in the [Technical Annex](#), Figure 15 shows qualitatively the relative influence of actors at different tiers of governance from global to local. Within this there are variations across the different administrations in the UK which are elaborated further in section 4. These are most significant in relation to bus, road and rail competencies and are reflected in Figure 16. Figure 17 shows the relative importance of the public sector compared with the private sector in terms of infrastructure and operations for the different modes and networks.

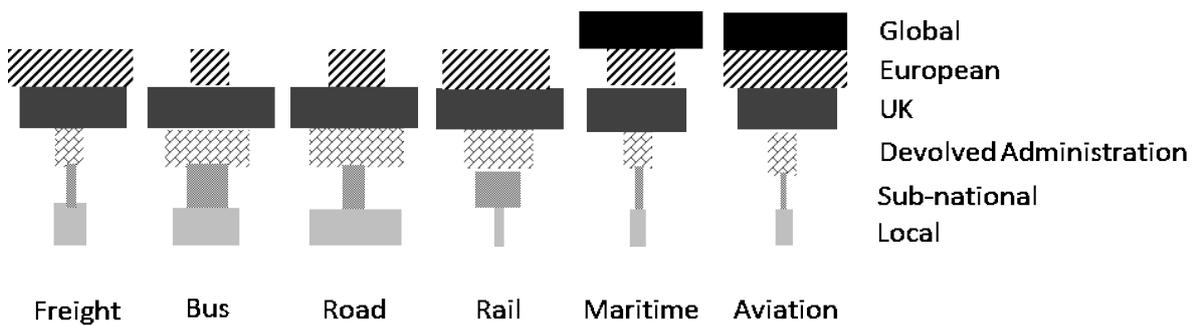


Figure 15: Relative Influence of Different Scales of Government Across Modes (author’s elaboration)

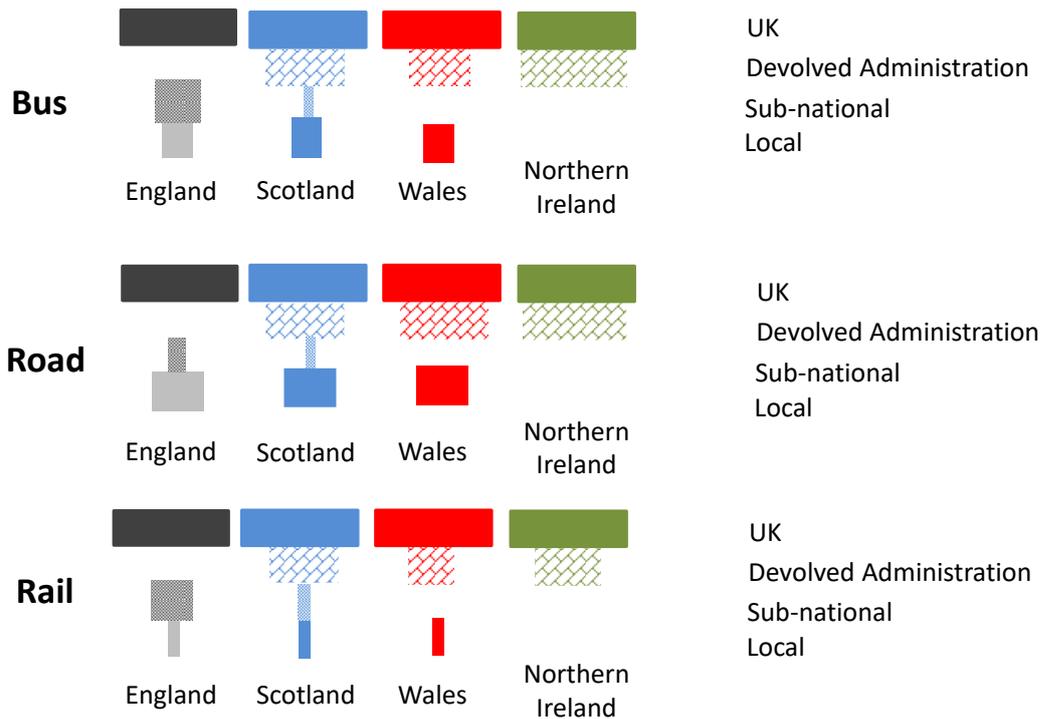


Figure 16: Variation in Government Influence in Bus, Road and Rail across jurisdictions (authors' elaboration)

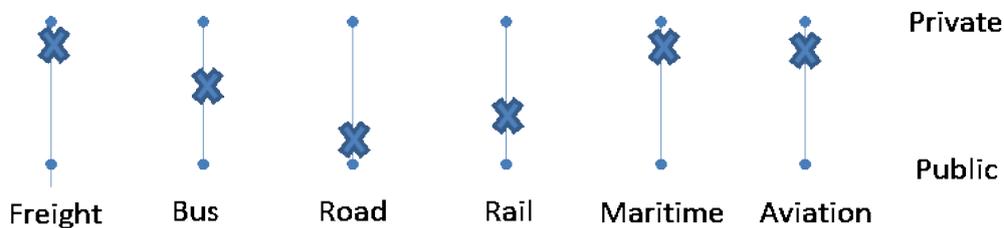


Figure 17: Private Sector vs. Public Sector Influence on Investment (authors' elaboration)

The **aviation and maritime sectors** are largely privately funded and operated but, because of their global connectivity, operate to a set of internationally consistent rules. The UK Government enacts these rules and ensures interoperability across jurisdictions, typically implementing EU-wide Directives. There is limited divergence in how these modes are governed within the UK.

The **rail sector** in Great Britain has significant government influence through the funding and strategic direction given to the-now-public sector network manager Network Rail. While England dominates spending on rail overall, Scotland and Wales influence the investment plans and the most relevant franchise specifications for services. Regulation of the rail sector remains a reserved power with Westminster. Although the EU has significant influence over rail, the UK has often been ahead of

the curve on implementing provisions and only some aspects of interoperability apply.

There is much greater divergence in arrangements for managing the **road network**. In Northern Ireland all national and local roads are managed by the Department for Infrastructure. In Scotland and Wales the national networks are managed by government departments or agencies and local roads by unitary authorities. In England the Strategic Road Network is managed by a government-owned company with some regulatory oversight. Local roads are managed by different tiers of local government. The registration and operation of vehicles (including buses and HGVs), driver safety and many aspects of road signage and use are managed by Westminster to ensure interoperability.

While the importance of transport to achieving broader societal goals is clearly recognised in strategy documents, the arguments about spending across different areas and between modes can be influenced by logics and processes within the transport sector rather being driven by how best transport can serve those wider needs. Some of this disconnect is hard-wired into our institutional structures and governance processes through fixed regulatory processes.

This section has introduced some of the variability between administrations and shown where greatest divergence exists. As well as divergence between administrations there is some divergence within administrations, particularly as a result of recent sub-national devolution in England. The next part of the report addresses these spatial differences and explores, through short case study vignettes, how and why these differences matter.

4. Governance and influence: What are the factors affecting influence within the UK transport system?

A key theme of section 3 was the **differences in structures for each of the transport modes and networks**. There are also differences across and within the four countries of the United Kingdom. Governments have much greater influence on investments in road and rail infrastructure and on the support and regulation of the services that use those networks. Some of this is divided already into national or strategic assets and local assets. However, the divide is not this simple in practice. In part this is because national networks are important for functions which might be seen to be local in nature (e.g. rail commuting) and the division is artificial in practice, with goods vehicles using both strategic and local roads, and travellers likewise.

This section begins, therefore, by exploring the differences across administrations and at a sub-national level within administrations. A key theme is to understand the flows of funding within the transport system and where decisions are taken. The arguments surrounding centralisation and devolution are often connected to the different views of local, sub-national and national governments about whether needs and priorities are properly recognised. This section draws on the Spatial section of the [Technical Annex](#) where further in-depth analysis can be found.

The section then considers three case study examples as a means of understanding further how different decisions are taken. Section 4.2.4 then reviews the mode and network-based analysis of section 3, and the spatial differences described in this section, to consider which factors are important in influencing decisions in the UK transport system.

4.1. Spatial differences

Section 3 described the institutional arrangements for the main motorised modes of transport and the key networks and interchange infrastructure. While it looked at differences across administrations this was limited in its depth. This section therefore takes the UK-wide coverage provided previously and breaks it down into country and then sub-national levels, paying attention to how this differs across the devolved administrations.

4.1.1. Devolved administrations

The doctrine of parliamentary sovereignty means that devolution in the UK is based on a formal division of powers between the Westminster Parliament and the devolved administrations achieved through legislation. The Scotland Act (1998) for example, which established the Scottish Parliament, therefore lists a range of

'matters' or powers that are 'reserved' to the UK government; that is those powers (such as over foreign affairs, the constitution and the macro-economy) that are critical to the overall maintenance of the UK as a single nation state. This means that the Scottish Parliament can legislate on any issue that is not explicitly listed as reserved.⁶ The number of powers initially reserved but subsequently devolved continues to be modified through, for example, The Scotland Act (2016) and The Wales Bill (2017) (see Sandford, 2015 and Bowers, 2016 respectively).

- **Roads** policy is substantially devolved, with the important reservations being vehicle safety standards and road traffic law (although the 2016 Scotland Act devolved the power to set the blood alcohol limit to Scotland).
- **Railways** policy is generally reserved (a common misperception is that it is devolved). Following amendments to the original devolution settlement in 2001 and 2005, Scottish Ministers were granted powers to specify the franchise for passenger rail services beginning and ending in Scotland, and the funding of rail infrastructure respectively. Similar arrangements will apply to Wales for future franchises (Champion 2016b). Powers over the structure of the rail industry, safety and economic regulation remain reserved to Westminster.
- **Maritime** policy is generally reserved, except for the powers to specify passenger services set out in section 3.
- **Aviation** policy is generally reserved, although the Scottish and Welsh parliaments are able to influence certain aspects of policy (especially pertaining to airports themselves) via devolved planning powers.
- **Local transport** is a devolved matter. The UK Government in Westminster therefore 'develops the policy and provides the bulk of the funding for local transport in England, including: buses, walking, cycling and local transport (highways and rail) more generally; in other parts of the UK this is provided by the relevant devolved administration' (Butcher, 2017, p. 3).

Figure 18 shows the total spend on transport and spend per capita by country across the UK. England, by virtue of its relative size, population and network lengths spends almost ten times more than Scotland and 50 times more than Northern Ireland. However, per capita Scotland spends the most on transport, while Northern Ireland spends significantly less than other administrations.

⁶ This is the reason that Climate Change – an issue that might be assumed to be cross-UK in nature given its scale and interaction with international treaties – is in fact devolved, since the notion of Climate Change as a separate legal 'matter' had not emerged by 1998.



Figure 18: Total Spend on Transport and Spend/Capita by Country. Source: HMT Country and regional analysis: 2017

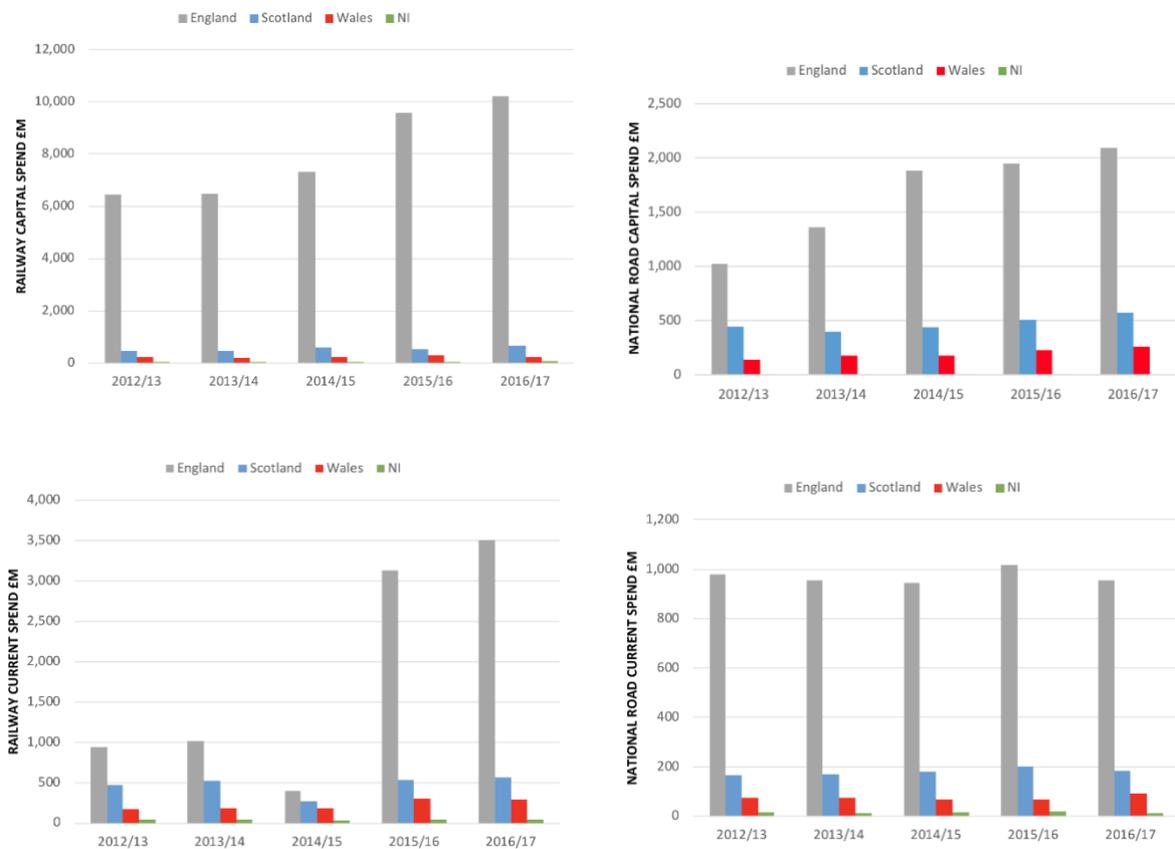


Figure 19 shows the capital and current spend by country on rail and strategic roads since 2012/13. The graphs reconfirm the relative dominance of England in both capital and current spend, as may be expected due to the comparative population of each nation. This matters when considering how the rules for spending on rail are developed for example. While the three national appraisal guidance systems are similar, the detailed interpretation and programme decisions of Network Rail follow a single approach. As the example in Section 4.2.2. shows, different priorities can exist in terms of programme scope and design between a national administration and Network Rail. Network Rail has to perform to its obligations within the regulatory framework of ORR and this framework is more strongly influenced by performance

across the English network where the majority of track and train services are which may make alignment more difficult.

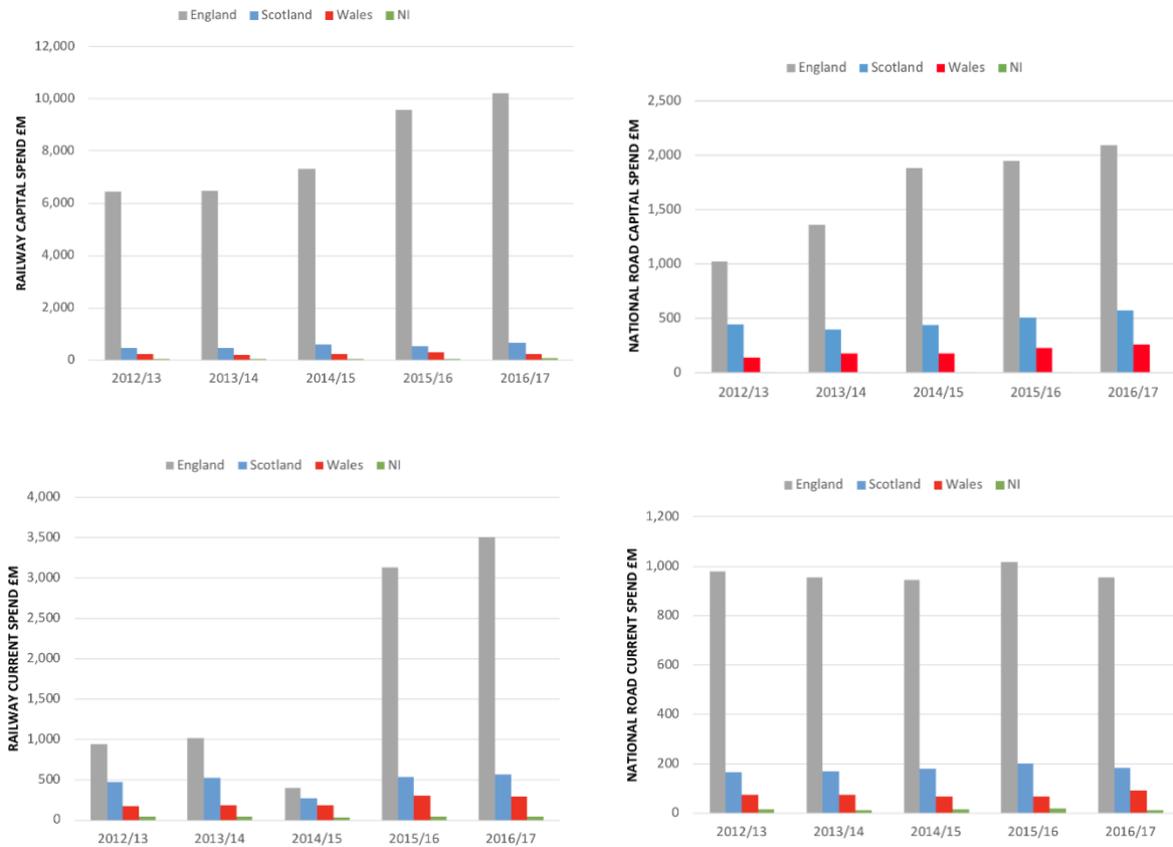


Figure 19: Capital (top) and current (bottom) spend on Rail (left) and Strategic Roads (right) by country. Source: HMT Country and regional analysis.

An analysis of spend across the different administrations shows a combination of different preferences, different networks and also different constraints. Figure 20 shows the spend across different areas of the Department for Transport. This largely pertains to England but for some agencies this is UK-wide. Railways dominate spending with Highways England the next largest recipient of funds and as set out in section 3.3 this is set to rise substantially. The figure for Network Rail is larger than that for railways' spend from DfT, because Network Rail has other sources of income, including subsidy and Crossrail.

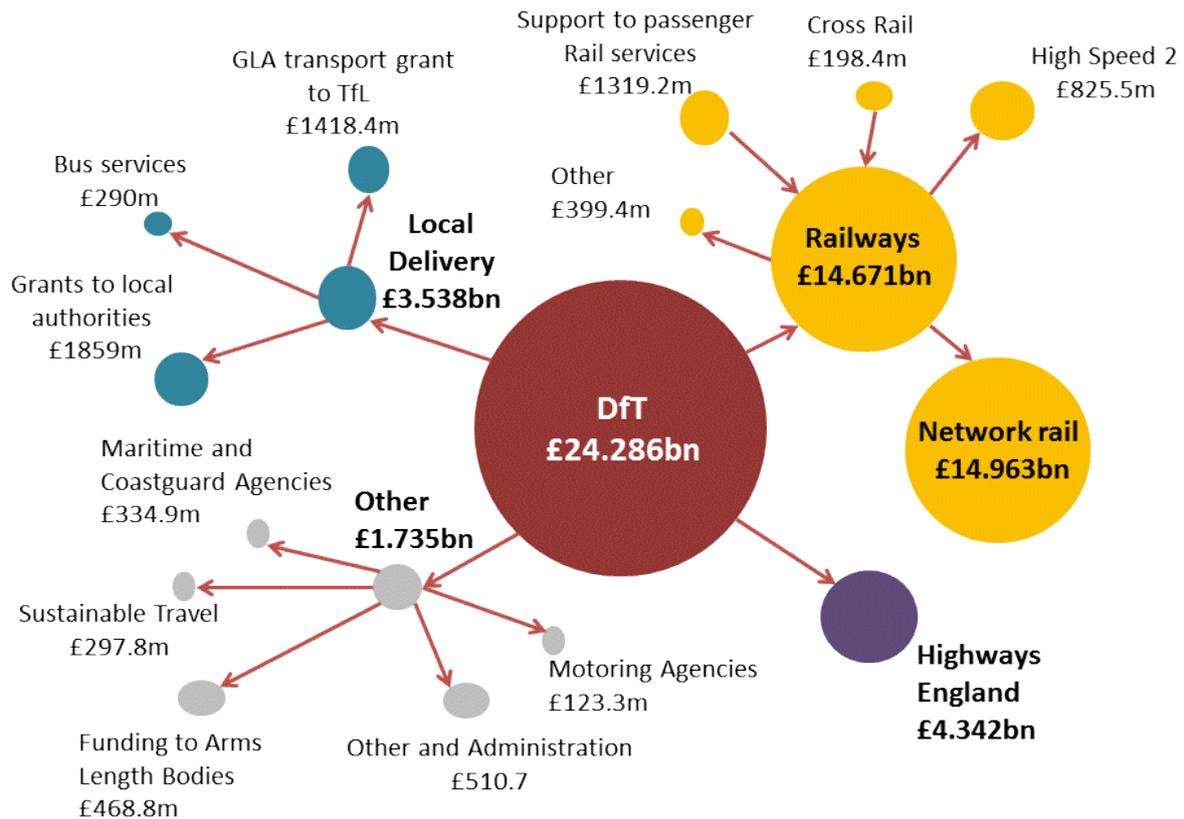


Figure 20: Department for Transport Spending (data: Department for Transport Accounts 2016-17)

Figure 21 shows the spend by category for **Transport Scotland**. Also evident in the funding breakdown of Transport Scotland is the highly significant share of expenditure devoted to rail. Notwithstanding the high cost base of rail in the UK per se (McNulty, 2011), this represents both the current large rail infrastructure projects such as the £750 million Edinburgh-Glasgow Improvements Programme funded by the Scottish Government, but also the high-quality specification of the ScotRail and Caledonian Sleeper passenger franchises. Also of interest is the c.£190 million annual expenditure on ferry services serving the western and northern islands. This level of expenditure on ferries is unique in the UK, and represents a highly significant funding constraint on the overall TS budget envelope for other initiatives. Equally, with Scotland accounting for 32% of the UK land mass but just 8% of the population (ONS, 2016; 2018), the trunk road network managed by Transport Scotland is much more rural in nature than that of Highways England.

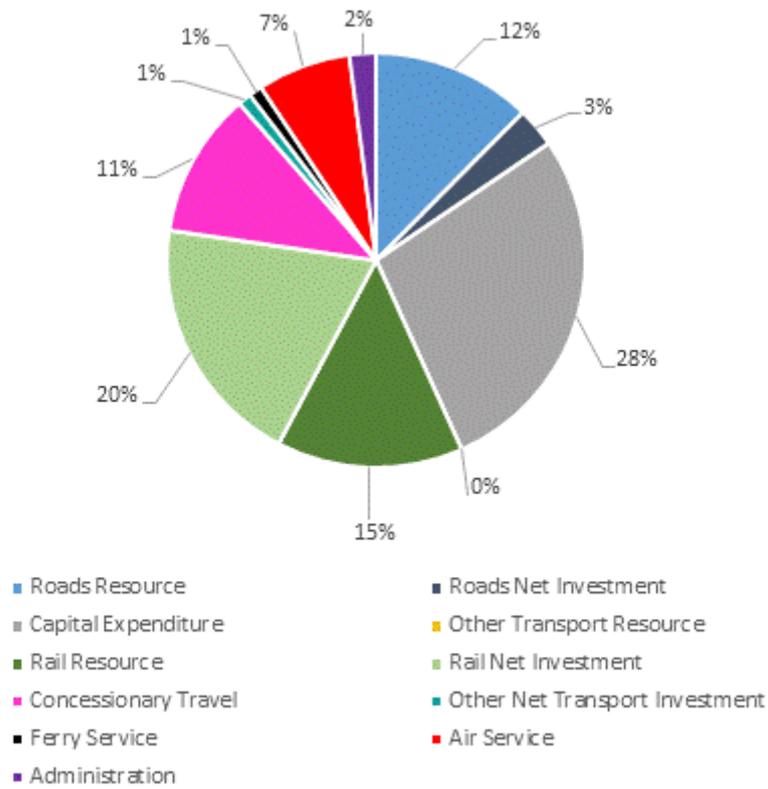


Figure 21: Spend by category Transport Scotland (data: Transport Scotland Annual Report and Accounts 2016)

Figure 22 shows the expenditure splits across all four countries as a percentage of transport expenditure.

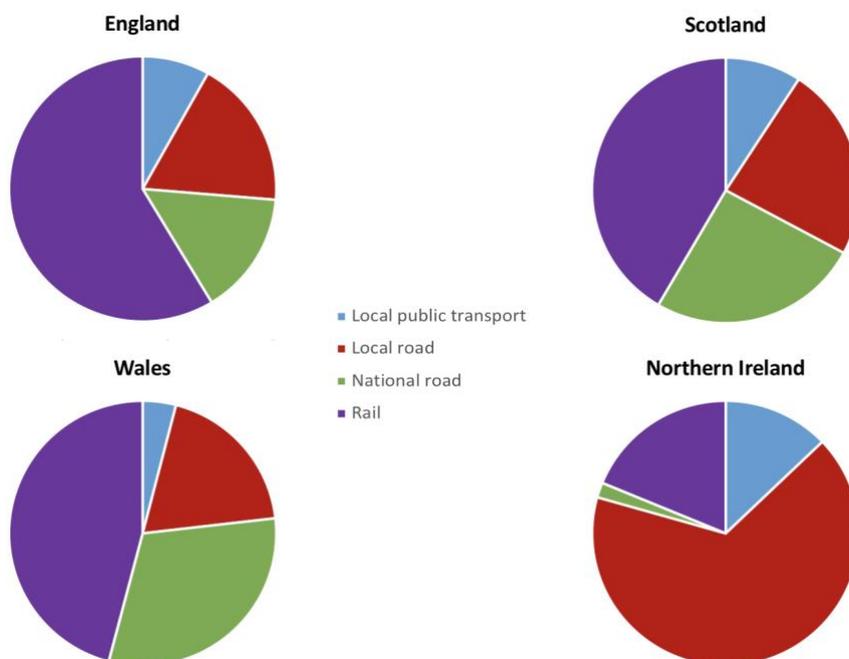


Figure 22: Spend by category by Country 2016/17. Source: HMT Country and regional analysis: 2017

The different national administrations have structured their approaches to managing transport in different ways, again reflecting scale but also devolution processes. In England Highways England is run as a government-owned company (see Section 3.4). In the other three administrations, the Strategic Road Network is part of an integrated single government department or agency. At one end of the spectrum, the Department for Infrastructure in Northern Ireland oversees all services and infrastructure investments and local authorities have no transport role. Wales has the next simplest set of structures with national control over matters such as administering concessionary fares for buses. Scotland has broadly similar arrangements to Wales but, as discussed further in section 4.1.2, has a regional transport governance tier. England has multiple layers as well as the additional structures around Highways England.

4.1.2. Sub-National Government

There exists a very different set of local delivery structures across the UK as shown in Figure 23. It ranges from entirely centralised in Northern Ireland (so not reviewed further here) through to a potential six tiers in England. Scotland and Wales largely function with a two-tier system of national and local although regional bodies have some limited influence and this tends to be in a state of flux over time. Spatial governance has been dynamic over time. Remits have altered, and organisations have changed or come and gone.⁷ Key differences are summarised below then some case studies are deployed to emphasise different approaches to decision-making.

⁷ Hence, it is only possible to be definitive about the number of tiers of governance when drilling down to a specific case study area.

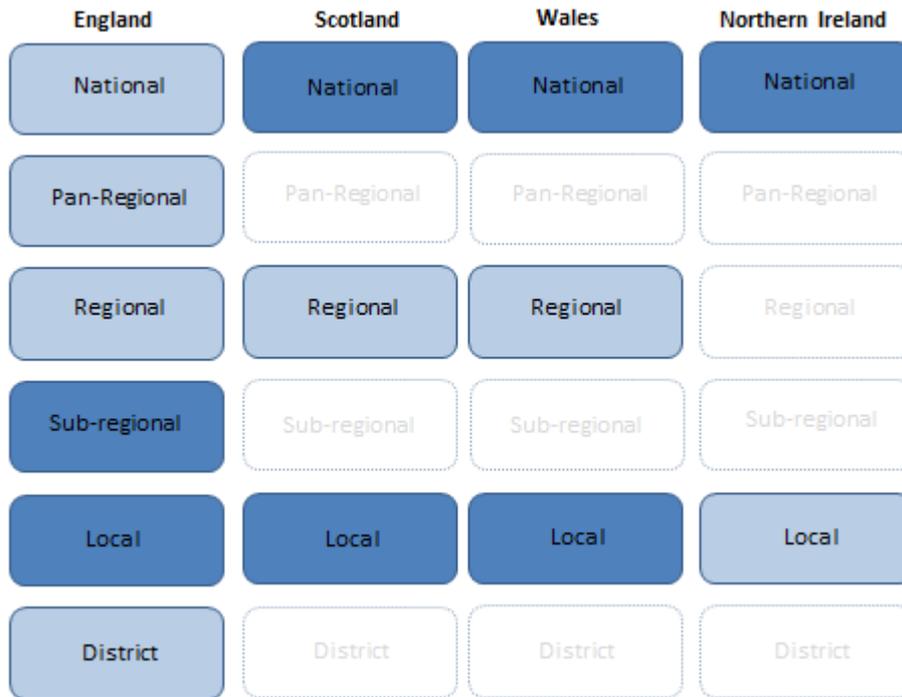


Figure 23: Different tiers of government across the UK administrations (authors' elaboration)

The National Audit Office in its 2012 review of funding of local transport in England summarised the overarching role of local government in planning transport services, stating that:

'They have around 300 statutory responsibilities for transport, such as developing local transport plans and administering the 'national concessionary travel scheme'. [Local authorities] plan and commission services (including bus and light rail), and provide and maintain infrastructure (collectively they are responsible for 98 per cent of the road network). Local authorities encourage public use by providing information and services for groups such as the elderly and disabled.' (NAO, 2012, p5)

Local transport planning in England is delivered through a variety of structures. In total there are **five possible types of local authority in England**. These are:

- 'County councils – cover the whole county and provide 80 per cent of services in these areas, including [transport], children's services and adult social care
- District councils – cover a smaller area within a county, providing more local services (such as housing, local planning, waste and leisure but not children's services or adult social care); can be called district, borough or city council.
- Unitary authorities – just one level of local government responsible for all local services, can be called a council (e.g. Medway Council), a city council (e.g. Nottingham City Council) or borough council (e.g. Reading Borough Council)
- London boroughs – each of the 32 boroughs is a unitary authority.

- Metropolitan districts – effectively unitary authorities, the name being a relic from past organisational arrangements. They can be called metropolitan borough or city councils.’ (LGIU, 2017, [brackets added])

In addition to these bodies there is the Greater London Authority which sets out the Mayor of London’s transport strategy. Transport for London acts as the delivery agency for much of the mayor’s transport strategy and works with the London boroughs for more local matters. Elsewhere in England there are nine combined authorities, many but not all of which are based around previous Passenger Transport Authority areas. According to LGIU, 2017:

‘These combined authorities receive additional powers and funding from central government. They are important for transport and economic policy across the regions in which they are based and in many cases for planning and delivery of services in conjunction with the associated Metropolitan Districts and other partners.’

There are currently nine combined authorities in England, seven of which have a directly elected mayor, with Sheffield due to elect a Mayor in May 2018. The history of these organisations derives from the Metropolitan Counties which were abolished in 1986. The county boundaries were broadly defined by the travel to work areas of the major cities. This logic has been reinforced with the Combined Authorities integrating economic and transport planning functions.⁸ Further information on Combined Authorities is available in the [Technical Annex](#) sections 2.3 and 2.4.

Transport for the North (TfN) was created in October 2014 and is a partnership of local transport authorities, the Department for Transport, and business leaders. Its membership includes 19 local authorities and 11 LEPs in the North and it works with national agency representatives from Highways England, Network Rail and HS2 Limited to develop plans and identify priorities for strategic transport infrastructure over the North of England. Draft regulations were laid before Parliament in November 2017 and TfN was granted statutory status as a sub-national transport organisation from 1 April 2018 (DfT, 2017c, TfN, 2018). Other sub-national bodies are also developing such as Midlands Connect, England’s Economic Heartland and Transport for the South East.

⁸ Travel to work boundaries are not easy to define and change over time and can be hard to map to local municipal boundaries. Barnsley for example connects to both the South and West Yorkshire labour markets. The Île-de-France area has integrated transport planning and over a much broader spatial area than the Greater London Authority and TfL, in part because of the scale of the regional boundaries in France.

Table 4 sets out, in general terms the division of responsibilities for local transport between national government and local government in England. As noted, however, local transport planning in England is becoming an increasingly heterogeneous set of arrangements. In London, for example, Transport for London is responsible for a core road network which is not generally the case for Combined Authorities in other cities. More information on these differences across areas is available in the [Technical Annex](#). Arrangements are also distinct in Scotland, Wales and Northern Ireland. These differences are discussed below with further detail given in the [Technical Annex](#) and in Annex A of this report.

Scotland has the most complete set of powers over transport devolved to it from Westminster. Through the Scotland Act (1998), the Scotland Act (2012) and Scotland Act (2015), most powers related to local transport have been devolved. These include, 'Roads and road-based transport: promotion of road safety; bus policy – including bus subsidies and regulation; cycling powers; parking policy; local road pricing (including congestion charging); speed limits; road signs; management of pedestrian crossings; and concessionary travel schemes' (Butcher, 2017).

In Scotland, three tiers of government matter to transport delivery: national (where Transport Scotland is the strategy and delivery organisation for the Scottish Government), regional and local. At a national level Transport Scotland is responsible for a range of policy areas which have direct influence over regional and local transport, as well as funding allocations and the approval of major scheme funding. Transport Scotland sets a policy context through a National Transport Strategy, it manages the national concessionary fares scheme for elderly and disabled people, liaises with regional transport partnerships, including monitoring of funding, and leads on sustainable transport, road safety and accessibility, local roads, bus, freight and taxi policy (Rehfishch, 2016).

Table 4: Roles and Responsibilities for Local Transport in England (NAO, 2012)

Service	Department for Transport	Local authorities
Road network	<ul style="list-style-type: none"> • Sets policy framework and provides guidance • Responsible for the Strategic Road Network (via Highways England) • Provides funding and guidance to local transport authorities for local roads 	<ul style="list-style-type: none"> • Manage, maintain and enhance local highway network (including traffic signals and signs)
Bus services	<ul style="list-style-type: none"> • Sets policy framework to determine how bus services are managed • Pays a grant to all private operators • Advises Department of Communities and Local Government on the formula for the concessionary fare payments scheme for local authorities 	<ul style="list-style-type: none"> • Contract with bus companies to provide commercially unprofitable services • Reimburse bus operators for concessionary fares • Run some community bus services • Maintain and enhance bus stops, stations and signs
Rail services (incl. light rail)	<ul style="list-style-type: none"> • Sets policy framework to determine how rail services are managed and sets high-level rail outputs • Provides funds for enhancing, maintaining and operating national rail network • Specifies and manages franchises with train operating companies 	<ul style="list-style-type: none"> • Are consulted when new rail services are contracted. • May buy extra services or infrastructure improvements from operators or Network Rail • London, Merseyside and Tyne and Wear specify and manage rail services within their area paid for by a grant from DfT • Some local authorities build and run light rail or community rail schemes
Other transport services and infrastructure	<ul style="list-style-type: none"> • Allocates funding for major schemes, services or funding competitions • Sets the policy framework for walking and cycling 	<ul style="list-style-type: none"> • Deliver transport projects, usually through third party contractors • Infrastructure for pedestrians and cyclists • Parking services • Licensing private hire vehicles and taxis

Transport Scotland sets out the purpose of Regional Transport Partnerships (RTPs) as being ‘to strengthen the planning and delivery of regional transport developments’

(Transport Scotland, 2017a). Each RTP has to prepare a Regional Transport Strategy and set out when and how cross-boundary projects and proposals would be delivered. It is also important to note that the Strathclyde Partnership for Transport (formerly Strathclyde Passenger Transport Executive) owns and operates the Glasgow subway and major bus stations across the west of Scotland. Transport Scotland establishes the administrative form of RTPs as:

'independent bodies corporate defined in the Transport (Scotland) Act 2005. That legislation bases them on the local government model but they are not local authorities and they are not NDPBs. RTPs are like joint boards, bringing councils together to perform local government functions collectively and strategically over a larger area' (Transport Scotland, 2017a).

With a focus on coordination, the RTPs are rather weak bodies in practice (Pangbourne, 2010). They rely on councils voluntarily sharing their transport powers, and although the potential exists in the legislation for an agreement to coordinate the roads function regionally, this has not taken place anywhere. Thus the role of the RTPs has largely been limited to producing a regional transport plan that seeks to guide the actions of other actors.

Strathclyde Partnership for Transport (SPT) is rather different as it was formerly a Passenger Transport Authority and Executive created under the same UK-wide legislation as its equivalents in England. SPT lost its powers to specify local rail services to Transport Scotland when the national agency was set up, which represented a major diminution in its powers. However, it still operates the Glasgow Subway, seven bus stations, and some local ferries.

There are 32 unitary local authorities in Scotland. Local authorities are the designated highways authorities for non-trunk roads. Scotland does not have Local Transport Plans but rather Local Transport Strategies, which have always been non-mandatory, non-statutory documents, but have been important where a local authority is planning to introduce a significant new intervention such as congestion planning. There are no powers available for Scottish local authorities to bring forward workplace parking levies, although there is a live debate between them and the Scottish Government about whether they should be granted the power to levy these and other 'ad hoc' or discretionary taxes in a range of sectors. Local authority areas reflect the geographical diversity within Scotland with wide variations in size (from 60km² in Dundee City council area to 25,656km² in Highland council area) and population (from under 20,000 people in Orkney Islands council area to over 600,000 in Glasgow City council area).

The Welsh Government is 'responsible for developing and delivering a transport strategy and a National Transport Plan' (Butcher, 2017, p.14). The last national transport strategy was published in 2008, although a more recent Finance Plan was produced in 2015. Local transport planning powers and arrangements have seen

substantial changes and continue to experience do so. This is due in part to the changing devolution relationship between Westminster and Cardiff and in part to changing emphasis given to transport planning through regional or local bodies.

The Wales Act (2017) will, broadly speaking, mirror the devolution agreement arrangements in place in Scotland so that all matters which are not specifically reserved for decision-making at a UK level will be devolved to Wales. This contrasts with the position at the moment where only those matters which have specifically been listed could be legislated upon. In effect, the key areas of local transport competence which will become devolved once the provisions of the Wales Act (2017) are put in place are:

- setting speed limits;
- regulating with regards to pedestrian crossings and traffic signs;
- prescribing signs and approving school crossing patrol uniforms;
- complete powers over the bus network including to legislate on re-regulation; and
- taxi and private hire vehicle (PHV) licensing.

Local government in Wales comprises 22 single-tier unitary authorities. 'The Transport Act 2000, as amended by the Transport (Wales) Act 2006, introduced a statutory requirement for local transport authorities to produce a Local Transport Plan (LTP) every five years and to keep it under review' (Welsh Government, 2014, p. 3). This is similar to the requirement for strategy development in England. It is up to local authorities whether to work alone or to submit joint plans with neighbouring local authorities. In total nine local transport plans were submitted in 2015 from the 22 single-tier authorities. It is important to note that in 2006, the Regional Transport Planning Order (2006) required that local authorities be part of one of four Regional Transport Planning consortia covering South East Wales, South West Wales, Mid Wales or North Wales and that this should be the basis for transport planning (NafW, 2006 and Figure 24). However, these consortia were abolished in April 2014.

Spatial Plan regions and Regional Transport Consortia

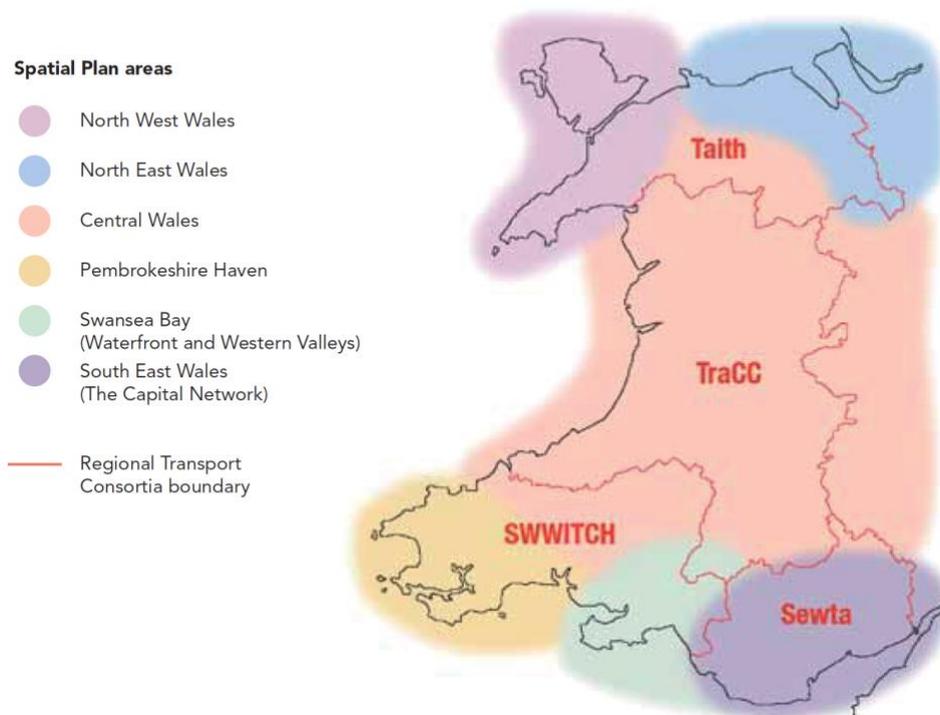


Figure 24: The now defunct Regional Transport Consortia of Wales (Source, NafW, 2008, p56)

The establishment of the Cardiff Capital City Region Deal has, however re-ignited a bottom-up discussion on integrated transport planning at a regional scale. In January 2017 the City of Cardiff confirmed plans for a non-statutory 'Capital Region Transport Authority' which would be responsible for:

- 'Pooled local transport resources;
- Regional planning for the local transport network;
- Working with Transport for Wales to ensure objectives for transport investment are aligned;
- Exploring the creation of a single integrated ticketing platform for public transport across the Cardiff Capital Region;
- Working in partnership with the Welsh Government to define the priorities of the South East Wales Metro concept and to support its delivery;...' (CoCC, 2017, p. 7)

Over time, therefore, there has been considerable variation not only in opinions on regional-level planning, but also in who has formal responsibility for transport planning at a local versus regional scale. The reality is that with nine local transport plans and one bottom-up regional body, there is a pooling of resources across authorities to help deliver cross-boundary projects and also in recognition of the scale of tasks and the need to share skills and resources effectively across boundaries.

The approach to funding suggests a very strong national-level influence over what happens year to year in each authority or plan area. The Welsh Government publishes a set of approved schemes which, for 2017–18 ranged from £4,000 for the production of active travel maps through to £1.5 million for highway works on Cynon Gateway South (Welsh Government, 2017).

It is important to note here that **walking and cycling planning and investment takes place at the local level.**⁹ It is not possible to be explicit about volumes of funding channelled to these modes as, aside from challenge funds, the expenditure is part of the integrated transport allocations given to local government. It is therefore difficult to separate out the spending on each mode when, for example a road or junction is upgraded. A noteworthy legislative difference between Wales and other administrations is the Active Travel (Wales) Act 2013. This requires local authorities to develop integrated network maps for active travel (walking and cycling) and to consider these when developing their local transport plans. The maps were due to be produced in Autumn 2017 and so it remains early in the process to say how this is affecting practice on the ground (see [Technical Annex 2.5.3.5](#) for further details). The Scottish Government has a Cycling Action Plan and the Department for Transport has a Cycling and Walking Investment Strategy for England (Transport Scotland, 2017b; Department for Transport, 2017e). While provision is delivered locally, there are increasing efforts to steer and incentivise local governments to do more to support active travel given the clearly recognised public health benefits as well as the traditional congestion reduction goals.

⁹ Sustrans maintains and develops a national cycling network. It receives some grant funding from government and works with local authorities.

4.1.3. Summary discussion

There is significant diversity in institutional arrangements across the UK, particularly between local and national tiers of government. This in part reflects the different sizes of the networks and populations governed. In Northern Ireland all transport is conducted by a national department. In Scotland and Wales the two primary tiers are local and national - although regional decision-making continues to play a role, formally in Scotland. In England there are six different spatial tiers. There has been a trend towards layering of institutions over time with some of the change coming from outside of transport, for example with Local Enterprise Partnerships and City Devolution and growth deals. This sometimes results in misaligned boundaries although it has brought together employment, skills and transport in some places. The reform of sub-national governance, particularly in England, generally added layers to decision-making processes. (Ward, 2017).

Regulatory power and budgetary responsibility, remain with national or local government for the most part. This relates strongly to democratic accountability for resource spend as well as some long-standing institutional path dependency (change is slow). However, here there has been some significant change over the past 20 years with devolution to Scotland, Wales and more recently Northern Ireland moving many tasks to newly formed national government structures. The establishment of the Greater London Authority and Transport for London has also been seen as successful. The shifts to Mayoral Combined Authorities alongside City Deals is a further move in this direction.

There remains a strong **logic for common regulatory oversight** of transport system operations where:

1. The flows are predominantly international and the UK contributes to rather than makes the rules.
2. The flows within the UK are significant across borders and where there is a need for interoperable systems within the UK (e.g. vehicle standards, train operating rules, payment mechanisms, electric vehicle charging standards).

There is greater divergence in defining what the **policy priorities** are for different areas and, therefore, what the balance of infrastructure spend across modes is, and the balance between carrots and sticks in terms of demand management. Here, the logic as to who should lead and who should influence is often less clear. Some examples which demonstrate this are:

- An infrastructure investment scheme that crosses multiple boundaries and serves, local, regional and national needs. Northern Powerhouse Rail, for example, could affect local authorities from Newcastle to Liverpool. It matters to those areas that the line passes through whether the services will stop and how often, and it also matters to those areas *not* being served which may, in

relative terms, lose out. Such a scheme is of national importance in England as part of economic rebalancing but it is also of pan-regional importance (the combined interests of the North West, Yorkshire and the North East), of sub-regional importance (e.g. Combined Authorities and LEPs) and important to the local authorities that form part of these or surrounding areas. The scale of the investment suggests the scheme needs national input, but there is a need to ensure that the scheme is shaped by local priorities and that any local contributions to funding can be coordinated (see also section 4.2.1).

- The introduction of a local congestion charging scheme. The costs of implementing the London Congestion Charging Scheme were a very high proportion of total income in the initial stages of adoption (initially 76% falling to 35%: Börjesson and Kristoffersson, 2017). The planning for the scheme was entirely run out of Transport for London. By contrast, in Sweden, the Stockholm congestion charge (introduced in 2006) was undertaken with an eye to national standardisation. When Gothenburg introduced charging in 2013 the same system was used with a common back office procedure for charging established and some additional bridges with tolls also brought under this system. Decisions to adopt a charge and how to design the charge are local matters but there are benefits to be had from coordination of a common technology for identification and system for payment. Gothenburg may have been too small to have afforded its own full charging infrastructure (Börjesson and Kristoffersson, 2017).

There are also policies and investments with diverging priorities which do not have such significant cross-boundary elements. These might be deliberate statements of policy divergence (e.g. different approaches to concessionary fares between Scotland and England and on drink drive limits) or they may simply be cases where convergence either does not make sense or is difficult or impractical to achieve even if it was desirable. For example, while good practice is shared on local road maintenance this is not harmonised and decisions on where to provide bus lanes are locally determined.

Wherever the institutional boundaries are established, there is a need to think about how adjacent levels of government might be involved in implementing policies effectively. This is how governance should be interpreted: it is the steering of multiple actors through a network. While there is a well-established set of studies suggesting that the role of governmental actors has diminished over time, there is also evidence that resources and power to act are still crucial to the development of networks and their governance e.g. Rhodes, (2007) or Docherty and Shaw (2008). It seems most important to think, therefore, about where resources and power to act lie for different types of decision. This is reviewed further through discussion of case studies in section 4.2.

4.2. Case studies

4.2.1. Transport for the North

Transport for the North (TfN) was created in October 2014 and is a partnership of local transport authorities, the Department for Transport, and business leaders. Its membership includes 19 local authorities and 11 LEPs in the North and it works with national agency representatives from Highways England, Network Rail, and HS2 Limited to develop plans and identify priorities for strategic transport infrastructure over the North of England.

The Cities and Local Government Devolution Act 2016 provides for the creation of Sub-National Transport Bodies (STB) and enables the functions of STB's to be derived from a number of sources including:

- The power to prepare a transport strategy and the power to advise, co-ordinate, and make proposals from the Local Transport Act 2008;
- Other public authority functions to be exercisable instead of, by, or jointly (but not concurrently) with public authorities; and
- Local transport functions (i.e. of CAs, LTAs, or PTEs) to be exercisable instead of, by, or jointly (but not concurrently) with local authorities. (West Yorkshire Combined Authority, 2016).

Draft regulations were laid before Parliament in November 2017 and TfN was granted statutory status as a sub-national transport organisation from 1 April 2018 (DfT, 2017; TfN, 2018). The regulations set out the functions of TfN in relation to transport strategy and delivery in the North of England. The key functions of TfN are:

- to develop a Transport Strategy for the North;
- to advise the Secretary of State on transport in the North;
- to co-ordinate regional transport programmes such as smart ticketing; and
- to co-manage the rail franchises in the North and the planned major road network.

A draft Strategic Transport Plan (STP) for the North of England was prepared with the aim of facilitating a transformation of inter-urban connections between centres of population and accelerating economic growth (Transport for the North, 2017a). It sets out proposals for a multi-modal programme of prioritised interventions comprising all transport modes reflecting the TfN's preferred options for achieving its aims within realistic budget parameters and was published for public consultation in January 2018 (Transport for the North, 2017a; Transport for the North, 2017b). Informed by the consultation outcomes, the final STP will become the adopted plan and main policy document for TfN later in 2018. It will be used to inform Government and its agencies of the priorities for investment in strategic transport connections.

Transport for the North was also tasked with assessing the case for some specific transport interventions including the proposals for Northern Powerhouse Rail

(Transport for the North, 2017c) and three strategic road projects: The Trans-Pennine Tunnel, M60 North West Quadrant, and North Trans-Pennine links via the A66 and A69 (Transport for the North, 2017d). It was also allocated £150 million of funding to develop plans and implement a project for integrated smart travel in the North (DfT, 2017c). In addition, Rail North will transfer to TfN when it becomes a statutory body in April 2018, ensuring that TfN can take a co-ordinated view of 'track and services' strategic planning and investment case development. TfN is also working on Strategic Development corridors, to help prioritise long term investment programmes and increase economic growth.

While TfN supports local and national government to align local investment in public transport and national infrastructure to form a coherent investment programme, TfN is not intended to replace or replicate the work of existing local transport bodies (Transport for the North, 2017e). It does however reflect the reality of increasingly interconnected labour markets spanning across what used to be more distinct travel to work areas.

TfN's Partnership Board provides direction, scrutiny and oversight on the TfN's strategy, performance and capability. It ensures that all partners in TfN have a say in decision-making. The Partnership Board also has a statutory role as an advisory body to TfN. It comprises of representatives from local government and LEPs, along with the Secretary of State for Transport and representatives from Highways England, Network Rail and HS2 Ltd. The Board has an independent Chair – John Cridland CBE, former Director-General of the CBI (Transport for the North, 2017f). Each local government representative receives a vote weighted to reflect the population of their constituent authority. To approve a Budget, approve the Constitution, or adopt a Transport Strategy will require an increased majority of 75% of the weighted votes and a simple majority of Members of TfN (Transport for the North, 2017h).

The Partnership Board is supported by the Executive Board which is the main body for managing and delivering the TfN's programme of work; it also provides decisions for approval to the Partnership Board. Its members include senior representation from each local transport authority partner, the Department for Transport, each national transport body, and the independent Chair (Transport for the North, 2017a).

TfN's funding is provided by the Department for Transport although its current funding comes from a number of different sources (Transport for the North, 2017g):

- **Core funding** – £50 million of non-ring-fenced funding over five years.
- **Transport Development Fund (Northern Powerhouse Rail)** - Approximately £60 million of ring-fenced funding to be spent only on Northern Powerhouse Rail Activity.

- **Transport Development Fund (Roads)** - Approximately £75 million for three Strategic Road Studies in the North which has been principally managed by the Department for Transport and Highways England.
- **Smart funding** – Funding for integrated and smart travel dependent on approvals through normal business case processes (£150 million).

The Constituent Authorities may also be required to contribute to the costs of TfN but the decision as to the amount of such contributions would require unanimous agreement and written consent from the Constituent Authorities (Transport for the North, 2017h).

If, in the future, further responsibilities were to be devolved to TfN (for example to set the strategic pan-Northern transport objectives for Highways England and Network Rail or to take responsibility for specifying franchised rail services), TfN would require powers currently exercised by central government to be devolved. These might include:

- powers to set the objectives and priorities for the Rail Investments Programme;
- powers to determine the franchise rail service specification; and
- powers to set and vary the objectives of the Road Investments Programme. (West Yorkshire Combined Authority, 2016).

The establishment of Transport for the North provides the basis of a single voice for the North on strategic transport matters, and the prioritisation of pan-Northern projects. Having governance and leadership drawn from both the public and private sectors, and with national and regional organisations as members, enables a comprehensive view of strategic transport investment, and how it supports wider policy objectives particularly for the economy. The scale of the organisation should facilitate more capability across a larger functional economic geography to deliver growth for the North, which would be difficult for single authorities to achieve. The body has been established to recognise the need to govern through a complex network and to try and provide a focal point for those discussions to take place.

TfN's focus is on strategic transport and pan-Northern measures to improve intra-urban connectivity. Some critics argue that the TfN should also seek to help improve local transport across the North by supporting local authorities in implementing their local plans. The argument is that the TfN will be seen as irrelevant to many communities if it does not also focus on local transport across the north. It should be noted that the development of smart ticketing is seen to be a step in the right direction.

As TfN represents a large area of England and is made up of a partnership of multiple groups, it may be expected to experience reaching a consensus when making decisions. For example, when deciding on where to focus investment it is likely that there will be multiple competing opinions. Meeting them all would risk

spreading investment too thinly, while prioritising certain projects over others would lead to difficulties during the decision-making process. Furthermore, this may make it harder to generate benefits that are only possible through a “joined-up” package of schemes and to meeting the need to prioritise to ensure value for money.

Large area multi-modal transport investment planning is not new in England. In the early 2000s a series of multi-modal transport studies were commissioned by the, then, Department for Transport Local Government and the Regions. These ultimately became unstitched when the delivery agencies (Network Rail, Highways England and the local authorities) all conducted their own prioritisation exercises and could not afford the expenditure on the proposals that the studies recommended (Shaw et al., 2006). The current approach seeks to overcome some of these difficulties by ensuring that the delivery agencies are integrated and the funding envelope is clear. However, the process still creates a further advisory voice in the decision-making process.

4.2.2. Edinburgh-Glasgow Rail Improvement

Scotland’s *National Transport Strategy* was published in 2006, and refreshed in early 2016 (Transport Scotland, 2016). The original iteration of the strategy was heavily focused on economic growth, and was focused on three ‘Key Strategic Outcomes’:

- improved journey times and connections, to tackle congestion and lack of integration and connections in transport;
- reduced emissions, to tackle climate change, air quality, health improvement; and
- improved quality, accessibility and affordability, to give choice of public transport, better quality services and value for money, or alternative to car.

The first Strategic Transport Projects Review (STPR), a 20-year programme of infrastructure investment projects managed by the Scottish Government in support of the NTS’s objectives, was published in 2012, and is due to run until 2032. However, once the current ‘refresh’ of the NTS is completed, the STPR will also undergo a mid-period review to ensure its planned programme of interventions remains appropriate. This is clearly a much longer planning horizon than either the rail Control Periods or Road Periods in England. This brings the potential benefit of a longer horizon to manage the investment pipeline and the supply chain required to deliver it, but also runs the risk of being more difficult to flex as the context for transport interventions changes.

The Edinburgh-Glasgow Improvement Programme (EGIP) is a set of rail network improvements including electrification and the rebuilding of major stations with a total capital cost of around £750 million. EGIP was one of the two national priorities identified by Transport Scotland in the original Strategic Transport Projects Review,

and is funded by the Scottish budget. This therefore differs from the arrangements for Transport for the North where strategy and resourcing are separated.

Responsibility for the actual design of EGIP rested with Network Rail as any major rail intervention would do. The early years of the project preparation stage were marked by friction between National Rail and Transport Scotland over the design and scope of the project. With no obvious mediation mechanism to resolve conflicting views, much time and resource was spent, with decisions bouncing back and forward between the two organisations until a final scope was agreed.

Delivery of some aspects of EGIP, most importantly the core electrification of the main line, has run significantly late and over budget (Office of Rail and Road, 2016). The Scottish Government has no option but to direct additional resources to Network Rail if the project is to be completed. Further, the late delivery of the project has ramifications for the revenue profile of the ScotRail franchise and therefore public sector support of the railway in the round. At the same time, the choice to use the franchisee to procure the new rolling stock for the route adds an additional interface to project delivery.

4.2.3. Liverpool2

The Port of Liverpool is owned by Peel Ports Group, which in turn is owned 50.1 % by the Peel Group and 49.9 % by Deutsche Asset & Wealth Management – formerly Reef Infrastructure. The £400 million Liverpool2 container terminal project involved construction of a new 854m deep-water quay able to accommodate two 380m long 13,500TEU ships. Construction started in 2013, although licences from MMO for dredging of over 5 million cubic metres from the seabed, much of it used for reclamation and creation of terminal land, allowed a start to the work in 2012. The terminal opened in November 2016. Three licences were needed from MMO to perform construction activities. In addition, planning activities for the project were carried out in conjunction with the Environment Agency and Natural England, to meet the environmental requirements. Plans for the terminal were initially given consent via a Harbour Revision Order issued by DfT in 2007 (Container Management 2007).

Sefton Council helped create and lead a Port Masterplan Group (PMG) early in the project's development (Sefton Council 2012). The PMG was tasked with assessing likely environmental and traffic impacts, to undertake community engagement, and engage with key stakeholders such as the Highways Agency, Sefton MBC, Peel Ports, and Mersey Maritime. The Port Master Plan was viewed positively within the Liverpool City Region Deal (Liverpool City Region, Local Enterprise Partnership, 2018). The project falls under Annex I of the EIA Directive 85/337/EEC as amended by Directives 97/11/EC and 2003/35/EC. A full EIA was undertaken for the project, including environmental impact studies (EIS) and a public inquiry. Principal contractor appointed by Peel for construction of the project is Lend Lease. Project cost was £400 million with £150 million of this financed through a long-term loan

from the EIB (European Investment Bank). The bank financed the project due to its 'capability as a category A TEN-T (i.e. core) port to support maritime and inland transport as an alternative to other modes and thus contribute to transport sustainability'.

The project was also dependent on a £35 million UK Government grant to dredge the Mersey to accommodate larger ships (BBC News, 2012). This grant was applied for by Sefton Borough Council from the Regional Growth Fund albeit with the money subsequently going to Peel to cover dredging expense (Osborne, 2012). The choice of applicant was considered by competing ports to be 'a device' to circumvent the issues of state aid which would apply if Peel Ports had been the applicant. The European Commission subsequently decided that the aid for dredging was for public works in the general interest and did not therefore constitute state aid (European Commission, 2014a); this reflects common practice elsewhere in the EU where public bodies maintain navigation channels.

The proposed Highways England scheme to upgrade the A5036 aims to reduce congestion on the main road serving the port. Although the project will have significant environmental impacts, the appraisal for the port project revealed economic and social benefits to Merseyside and the broader North-West region, noting that it would add £5 billion gross value to the local economy and 5,000 direct and indirect jobs of which 400 will be at the Port of Liverpool (Bam Nuttall, 2017). Peel Ports is a member of the government's Northern Powerhouse Partnership Programme, which aims to champion the North's strengths, as well as promote local developments across transport, skills and innovation, culture and devolution. Environmental factors represented key issues within the regulatory landscape, followed by financial challenges. Support of the local council was crucial for the project, as was the high-level political support at UK level. This in turn helped create support for grant aid deemed essential for the project to proceed. EU designations (core port status) assisted in terms of the EIB loan facility, the latter allocated on preferable public-sector terms (i.e. longer repayment term than a commercial loan).

The case reflects how different institutional actors discharge their responsibilities in the context of a major maritime infrastructure development. It also shows the funding challenges faced, including the possibility (and need) for ports to access public funding - something the prevailing UK policy approach towards ports does not always fully recognise. The business case for the development of the port did not, however, have to go through a standard project appraisal, although the connecting road infrastructure did. The future role of the EIB as a financier of investments such as this may need to be re-evaluated following Brexit depending on whether UK infrastructure remains part of the Trans-European Transport Networks.

4.2.4. Discussion of factors

The three cases allow a comparison of different aspects of the decision-making process:

- **Project Specification and Funding.** In the case of the Edinburgh-Glasgow Improvement Programme (EGIP) and Liverpool2 there was a clear 'client' for the work and specification of need. In the case of EGIP the scheme entered the Transport Scotland infrastructure pipeline and then formed part of Network Rail's delivery programme. Funding was obtained through the Transport Scotland block grant for the most part. For Liverpool2, the driving force was the private sector owners of the port facility. However, there was clearly a need to build a consensus at Liverpool City Region level and National Government about the need for the expansion. In the case of Transport for the North, the aim has been to try and ensure that there is a clear specification of need, which prior to the establishment of TfN had proven difficult to achieve with so many potential voices influencing the debate.
- **Project delivery.** In the case of Liverpool2, the majority of the works were conducted and co-ordinated by the port itself, including the dredging work for which government grant funding from the EU had been obtained. The specifier and the funder were the same organisation. By contrast Transport Scotland relies on Network Rail for effective delivery of the EGIP project and is required to fund overruns.
- **Network of Actors.** While ports are predominantly private sector concerns it is only through working in partnership with the local authority that expansion schemes become feasible. In the case of Liverpool2, planning permission, sourcing funding for dredging and interfacing with Highways England were all necessary to ensure the investment took place. So, while the private sector is key to instigating projects in ports, the public sector is an important delivery partner. The success of Liverpool2 can be contrasted with a failed freight terminal proposal in Radlett where the development was challenged by the local authority (see section 1.3.5 of the [Technical Annex](#)). The network for the EGIP case is coordinated by Transport Scotland and is far simpler than that developed around Transport for the North. The delivery environment, though, relies almost exclusively on Network Rail so, once the decision has been taken and the investment is programmed this appears easier than with Liverpool2.

As noted earlier in this section, generalising about factors that influence delivery can be a little shallow when there are so many differences between areas. However, the common factors which seem to be important in seeing infrastructure projects advance are:

- Identification of a clear need
- Developed consensus across key actors
- A clear funding channel.

This would seem consistent with analysis which suggests that Transport for London is an example of an effective urban transport authority as it has these elements

largely within its control, with the exception of mega-projects such as Crossrail. The analysis of Scotland in section 2.1 of the [Technical Annex](#) makes a similar point. Transport Scotland has established an effective process to identify need across modes and areas, and it is clear that this is the principal agency around which project ideas will be developed and delivered. It has a clear budget and therefore a certain pipeline of investment. In both of these cases, the ‘culture’ of governance in each location is an important additional factor: in both London and Scotland, there is both more potential and political desire for vertical alignment of transport strategies ‘centrally’. Similar cultural differences can also be seen in those European examples that are often held up as good practice in effective transport governance see, for example, Paulsson et al. 2016.

It was also suggested in our work on the future of funding that a stable funding environment and long-term investment pipeline was important for effective delivery (IPA, 2016). This can be both in ensuring a stable construction sector and building the right skills and capacity to design and deliver schemes within organisations (see also HMT and Infrastructure UK, 2010). This is discussed further in section 5.1.2 of this report.

4.3. Summary

Section 3 demonstrated that there was a clear divergence of approaches to the funding, regulation, investment and operation across different modes of transport. Each network or mode has its own regulatory environment which has developed somewhat independently of the others. This section has demonstrated the importance of the network of actors surrounding different decisions and the connection of the actors involved with the funding necessary to implement decisions. The process of devolution and the move to the new public management principles in creating a wholly-owned government company in the form of Highways England, subject to external economic regulation from the ORR (see Docherty et al., 2018b), has led to a divergence in the configurations of these networks across the UK. To understand which factors really matter to decision-making therefore requires a clear understanding of the context of the decision.

Nonetheless, while parts of the transport system are privately owned and parts publicly owned, there are some common themes which are important to all investment decisions:

- Identification of a clear need
- Developed consensus across key actors
- A clear funding channel

While it is possible to point to examples of privately led initiatives which have been delivered (e.g. Liverpool2 port expansion) with good joint working between the private provider and the public sector, there are examples where this has not been

effective. For example, while there is a clear need identified for airport expansion in the South East of England and a willingness by the competing airports to fund such developments, the political consensus necessary is not in place. This has hampered progress over the period since the 2002 Airports White Paper. So, it is not a simple question of public versus privately driven leadership which matters.

In road and rail, where public sector investment dominates, the issues relate to a large degree to the development of a consensus across key actors and then relative prioritisation of need within a fixed budget. There are more new schemes to develop and pinch points to fix than funds available. While there is a national methodology (with some variation across devolved administrations) to look at the case for different projects, this does not fully resolve the public policy questions which shape how investment packages are developed. Here, the arguments of strategic need can be articulated differently by different local or regional actors and there is inevitably a competition for funding. While some of the restructuring of governance has helped to clarify the key actors in the network and given them control over the process (e.g. Transport for London and Transport Scotland), this is not so easily repeated in England. In all cases, boundary issues will always exist so it seems that focusing on managing those issues in an effective way will help. It is too early to say if new bodies such as Transport for the North will achieve this.

As discussed further in section 5, funding also matters and longer-term funding settlements for the road and rail networks and better planning from devolved agencies results in a more certain pipeline. This ensures that once the work on defining the case is largely done it progresses rather than stalling, ultimately requiring cases to be remade over again further down the line.

The UK has traditionally had a standard approach to assessing the benefits of publicly funded transport investments. The assessment methods in Wales, England and Scotland have diverged to a degree since devolution although the core benefit:cost ratio methods remain aligned. The £4 billion of spending in Scotland and Wales is therefore spent on priorities which are shaped differently to those in England. With greater devolution to cities and combined authorities in England there is scope to debate whether there may be a further shift from centralised to decentralised responsibility for ensuring funds are well spent. As an example, the rejection of the Leeds NGT trolleybus system in 2016 was the end of a 25-year process which initially proposed a tram system. This had been rejected by the Department for Transport in November 2004 following cost increases. A subsequent trolleybus scheme was rejected in public inquiry and this was upheld by the Secretary of State in 2016. In total it is estimated that scheme development costs were £70 million over the period (CIHT, 2016). The Department for Transport instead awarded £173.5 million for bus improvements. The tensions between national oversight of expenditure and re-visiting decisions to ensure good value for money and local determination of priorities are clearly shown, but this tension is present for

all major local schemes. Should accountability for spend reside with the local or national level and, if both, then what is the right balance?

Given the structures and ways of working in place today, Section 5 reviews the evidence on what works and where the key 'pain points' in the decision-making system are. Section 6 looks ahead to the period to 2040 and offers some insights into how new innovations will challenge the existing structures and rule sets and how this might present opportunities to overcome some of the barriers highlighted in section 5 as well as creating new issues to address.

5. Outcomes from the system: Strengths and Challenges

This section reviews some key strengths arising from the review of current governance arrangements before identifying some of the governance challenges which the existing arrangements generate. The strengths and weaknesses were identified by the topic experts as part of their brief, and a full list can be found in each section of the [Technical Annex](#). While these are all based on evidence and experience in the field, they are inevitably coloured by the views of the experts. At the workshop on 27 November 2017 participants were asked to identify gaps or additional points, to challenge the list produced and to prioritise them in importance. While again this is influenced by the participants who attended relative to those who did not (ports, airports and freight were particularly under-represented), our aim was to focus down on some more important matters rather than be comprehensive or to imply prioritisation of factors.

5.1. Strengths

As Eddington set out in his 2006 review of the UK transport system, it moves a 'staggering number' of journeys a year and 'in broad terms it provides the right connections, in the right places, to support the journeys that matter to economic performance' (Eddington, 2006, p.1). Participants at the workshop identified that there are clear pressures on the transport system in different places and at different times of the day. Some places have gaps in transport provision (CBT, 2013) and for many travel is expensive (Mattioli et al., 2018). However, in reviewing strengths and challenges it is important to start from a recognition that the system in place today offers better connectivity than in many of our European neighbours (Eddington, 2006).

5.1.1. The importance of transport has been recognised in increasing capital spending

UK public expenditure on transport has fluctuated considerably over time, as shown in Figure 25. The fluctuations are for a range of reasons. In the 1990s for example the UK Government approached the rail network as something to be managed in an on-going decline (Shaw and Docherty, 2013). The period from 1997 onwards saw New Labour cut back on spending in line with the previous Conservative administration's spending plans, but also saw a shift away from the 1989 Roads for Prosperity major road expansion programme.

In particular, in the years following the recession of 2008, governments in the UK have recognised the importance of infrastructure to supporting economic

development, particularly in the light of extensive pressure from population growth and housing growth rather than growth in personal travel. The UK shifted from spending around 0.2% of GDP on roads between 2004 and 2013 (around 40% lower than Germany and 50% lower than France over the same period) to spending 0.3% by 2015 (15% higher than France and Germany),¹⁰ with commitments to further expansion. Rail expenditure has been higher than France and Germany over the same period although the costs of construction, operations and new investment in the UK remain far higher (estimated at 40% higher in 2011), in part due to the older network assets but also due to industry structure (McNulty, 2011; HM Treasury and Infrastructure UK, 2010).

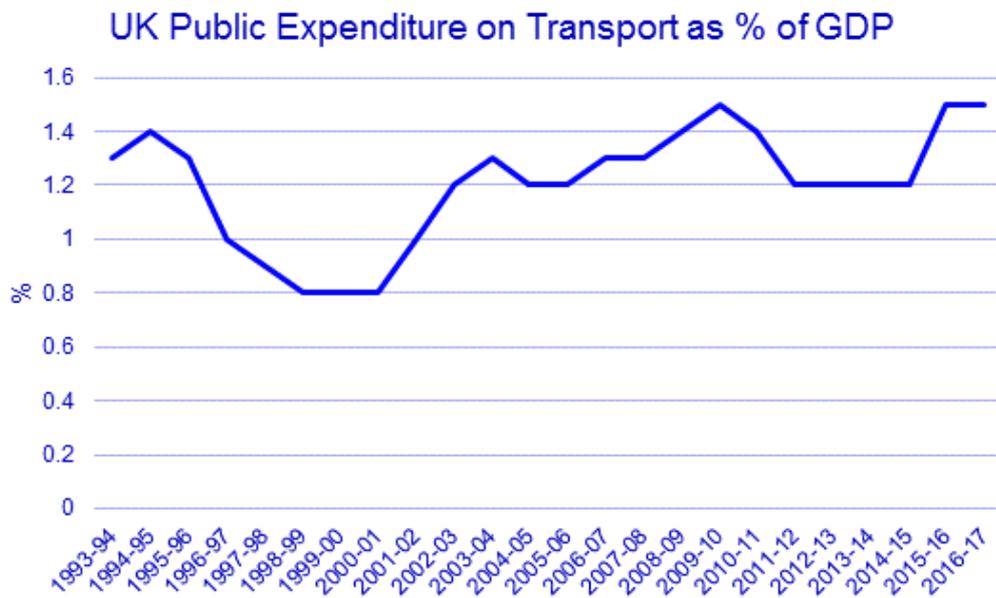


Figure 25: Spend on Transport as a Percentage of GDP (data: Transport Statistics Great Britain)

There is now a clear pipeline of projects in transport as shown in Figure 26. While this covers both public and private expenditure, 87% of this is publicly funded, 7% public/private partnerships and 6% private.

¹⁰ Data taken from <https://data.oecd.org/transport/infrastructure-investment.htm>

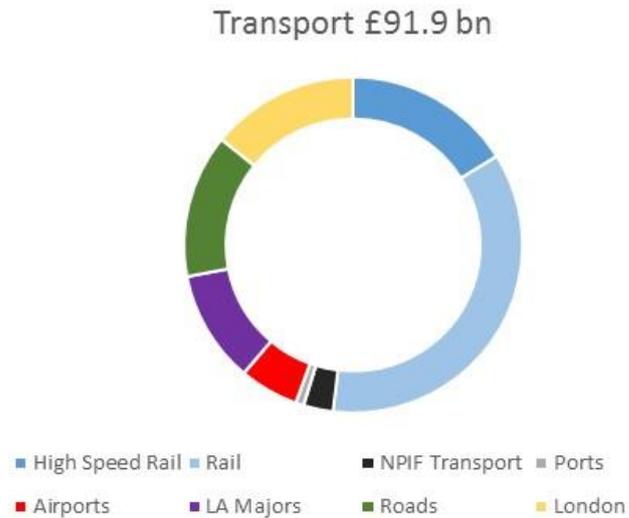


Figure 26: Combined Public and Private Sector Infrastructure Projected Capital Spend for Transport 2016/17-2020/21¹¹ (IPA, 2016)

5.1.2. Longer term spending commitments allow for better planning and delivery

There has been a shift towards longer-term funding of national networks. The shift from the Highways Agency to Highways England was undertaken following the Cook Review (2011). That review identified the difficulties which the previous annualised funding arrangements created for investment planning with variations leading to stop-start funding and loss of efficiency with suppliers. The five-year Rail Investment Strategy (RIS) process on the rail network across the UK is now mirrored on the Strategic Road Network. In Scotland, a different approach has been adopted with three-year indicative funding allocations for Transport Scotland. There has also been a clear and consistent pipeline approach to projects and this has also aided delivery. It was suggested that a clear infrastructure pipeline is also important in creating organisations that are attractive to skilled staff and that this builds a virtuous circle of improved policy, project and programme development. We cannot verify that, but can point to organisations which are effective in their delivery such as Transport for London, Transport Scotland, Highways England and Transport for Greater Manchester where this seems to hold true.

This longer-term approach also has value at a local level but is only very partially achieved. The shift to Combined Authorities and agreements for City Deals leads to greater certainty over some of the capital programme spend. The Tees Valley Combined Authority (TVCA) case study (see chapter 2.4, [Technical Annex](#)) shows that the mayor and the TVCA have access to a single pot for investment in transport

¹¹ NPIF Transport – National Productivity Investment Fund

with a commitment for an investment fund of £15 million per year over 30 years. In addition there are several funding streams which are subject to fluctuation including: Integrated Transport Block (formula funding); Highways Maintenance Block (formula funding); Highway Maintenance incentive funding; National Productivity Investment Fund (2017/18 only); Pothole Action Fund; and the Transforming Cities Fund.

5.1.3. Cities are being given more powers and are starting to be more ambitious

Transport for London is recognised as a globally leading transport authority (NYC, 2008). Twenty years ago it did not exist and was a fragmented set of agencies responsible for bus, underground and traffic signals. The combination of the right powers, funding commitment, democratic accountability, leadership and political will has ensured that the high-quality networks and favourable regulatory environment have been capitalised on to deliver major transport improvements and an integrated system piloting new technologies.

There are early signs of evidence that this may be starting to happen in other cities. Transport for Greater Manchester (TfGM) has developed a vision for 2040 (TfGM, 2016) and is delivering a major investment programme to improve the transport experience and economic function of the city region, led now by an elected mayor. The integration of Local Enterprise Partnerships and Transport Authorities together in Combined Authorities brings greater opportunity to connect transport investments to their broader goals (see also West Yorkshire Combined Authority Case Study in the [Technical Annex](#), chapter 2.3).

While the devolution agenda appears to support the creation of stronger cities, the ingredients of leadership, strategy and funding are also evident in other places. Nottingham City Council, for example, remains the only city to have introduced a Workplace Parking Levy and is using the revenue to support the growth of its tram network as part of a broader integrated transport and growth strategy (NCC, 2011). These elements have also been found to be important in European cities with good transport networks (Docherty et al., 2009). Part of the reason that progress in developing urban transport has been less impressive than envisaged by successive governments is the continued dislocation between the transport and land use planning powers; these are often better integrated in the legislative frameworks of continental countries. Many UK cities have struggled to align transport investments with coherent land use frameworks strong enough to resist the kind of (mainly out-of-town) developments that encourage greater car use and are difficult to serve by public transport¹².

¹² See <http://www.transportworks.org/evidence-base/transport-and-land-use> for a discussion and reading list on this issue

5.1.4. Transport markets are professionally regulated with good interoperability and safety records

Many examples were provided across the different modal expert reports regarding the high quality of the regulation of transport industries in the UK. Transport networks are natural monopolies and so require effective regulation. The Civil Aviation Authority is recognised as a global leader in its field (DfT, 2008) and the Office of Rail and Road provides an evidence-led scrutiny of progress against efficiency targets for Network Rail and Highways England. Increasing voice is being given to the consumer as part of the regulatory process with Transport Focus taking on a broader remit.

In the freight industry, while it is true that there is a diverse range of potential infringements and therefore jurisdictions responsible for these, there have been many examples of effective multi-agency approaches. This includes simultaneous checking for vehicle condition and licensing, overloading, driving hours, tachograph offences, taxation offences and illegal immigration (Commercial Fleet, 2017).

Although the devolution of transport powers has become more important over time, there has been a retention of powers to ensure interoperability of systems and joint liaison between governments to oversee practical aspects of knowledge sharing to ensure the UK transport system remains fully interoperable. This seems set to continue in importance as the transport system becomes increasingly intelligent and automated (e.g. for new Vehicle Type Approval procedures become necessary).

Through a combination of effective regulation and commitment to improvements in the operation and maintenance of the transport system, the UK's safety record for transport is very good across all modes. Only Sweden, Switzerland and Norway have fewer road deaths per million population than the UK out of 37 comparator EU and other international countries (TSGB, 2016). It was however, noted that progress has stalled to some degree and that pedestrian and cycling safety rates compare poorly to other countries at the top of the league table such as Sweden and the Netherlands (PACTS, 2017).

5.2. Challenges

5.2.1. Siloes persist between transport and other policy areas

People travel to take part in activities such as employment, health and leisure. Transport policy is not just about the regulation and management of the system and the modes in the system but also about these wider connections. There are benefits to other areas of public policy resulting from some transport interventions (e.g. agglomeration effects for business (Graham, 2007) and health benefits from walking and cycling (Panter et al., 2016)

There are also costs when transport is difficult to access or costly-in terms of unemployment, missed health appointments and limited travel horizons to seek out opportunities (Lucas et al., 2016).

This is not new (Hull, 2005). In particular misalignment between spatial areas responsible for land-use and transport planning and different timescales of processes in both areas have long-existed (Headicar, 2009). Integration of the Local Enterprise Partnerships and Transport Authorities is a positive recognition of the need to achieve the synergies between transport and economic development (see WYCA Case Study in [Technical Annex](#), chapter 2.3). In addition, public health is now more closely integrated within local government across Great Britain (Heath, 2014 and Scottish Government, 2008). However, while the aspirations for more integrated cross-sectoral planning remain, it appears to be difficult to achieve in practice.

As section 3 of this report explained, the regulatory structures and incentive structures in place for investment in road and rail have been developed through legitimate concerns about how to regulate natural monopolies to achieve efficient outcomes. Ports and airport decisions are largely motivated by profit concerns and there are more limited points of national strategy leverage. While capital expenditure has grown, particularly on national networks, funds for local transport expenditure and service support, have diminished. Thus, the concerns which shaped the transport decision-making processes we have in place today were not built to establish the contribution towards or necessarily achieve these wider connections.

This of course is not just a problem for the transport sector but also for the related sectors such as health, social care, employment and housing. The squeeze on public sector resource funding has placed pressure on staffing across all service areas (Stewart, 2012) while demands on services may also be growing (e.g. Maguire et al., 2016). This may put pressure on any activities which are not seen as core tasks. There is recognition of shared issues and of the potential for expenditure in one area to save costs in another (e.g. Mueller et al., 2016 and Greener Journeys,

2016). However, a substantial change in approach has yet to be delivered through the existing structures.

5.2.2. The governance environment has become more complex in England

As identified in section 4, there will always be tensions between the extent to which schemes are local, regional, inter-regional or national in importance. Two opposing patterns have emerged outside of Northern Ireland (which has the simplest structures but which does not seem replicable). In Wales and Scotland the national tier has strengthened its role with, essentially a two-tier national/local set up for spending, and regional tiers having a largely advisory role where they exist. In England, there has been a strengthening of the regional tier of governance through LEPs and an increase in Combined Authorities which operate over multiple local authorities. The advent of Transport for the North may mark a broader establishment of a further layer of governance, with calls for such arrangements to be replicated elsewhere in England. City devolution is also leading to a difference in powers and funding agreements across each of the areas as part of the agreed deals. There are, therefore, new voices in the debate on spending priorities and also new geographies over which boundary disputes or political arguments need to play out. It is too early to say whether this will improve decision-making.

Some of the Combined Authorities have been established with elected mayors, although this is not the case for all. It will be important to understand whether these arrangements produce the anticipated improvement in strategic direction and delivery. In the Tees Valley Combined Authority (see chapter 2.4 of [Technical Annex](#)) for example, the mayor is of a different political party to the constituent local authority members. This type of arrangement could stymie progress (although there is no evidence of that to date).

While strategic decision-making bodies have been enhanced at higher tiers, there has been little change to the lowest tiers of government. As yet, for example, each district authority in the metropolitan area establishes its own taxi and PHV licensing approach and these differ across a city such as Manchester (Linton and Bray, 2017). Only in London, where this was established at the outset of London devolution, is there a Strategic Road Network managed by the overarching transport authority. The net effect of all of these changes is a layering up of complexity in England.

5.2.3. The Current Spending Pattern Distribution will be Difficult to Maintain

There is a growth profile for investment in transport, as identified in section 5.1.1. This, combined with longer-term funding commitments for Highways England to go with that

of Network Rail is identified as a positive. However, some very significant funding tensions exist today and these seem likely to become more significant.

First, while high priority has been given to the Strategic Road Network (SRN), despite recent additional funding pots, industry figures suggest the maintenance backlog for local roads has risen to £12.06 billion and the annual shortfall is £730 million (AIA, 2017). There are also some very substantial disparities across the UK. England spends 30% more per mile on local roads than Wales. Greater spend is likely given its larger population. The North West spends around 60% more per mile than the East Midlands and the South West

(see Figure 10). However, the breakdown across seemingly similar areas suggests that the differences will not all be down to different local road geographies and need. While the issues are different for the SRN compared to the local road network (e.g. the SRN has much larger freight flows) the total spend per mile on the SRN is 34 times that per mile on the local road network in Scotland and 29 times the local spend per mile in England (2015/16 figures).

Second, while the capital funding pot is planned to expand, there has been a sharp decline in the revenue resources supporting the delivery of local transport such as socially necessary bus services, road safety interventions and behaviour change measures (e.g. school travel plan officers) (Figure 27).

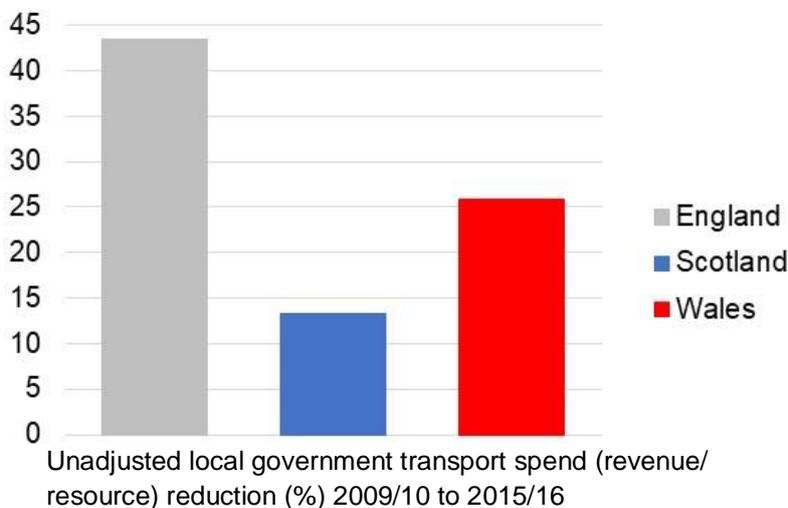


Figure 27: Declining revenue resources for local government (data Department for Transport: transport expenditure, 2017)

(Source: DfT 2017, Table TSGB1302)

As described in section 3.5 a 27% drop in net supported for buses has resulted in a 40% reduction in supported bus service miles due to the shift of resources required to fund the mandatory concessionary fares policy.

On the rail network, around 70% of the costs are covered by fares. Regulated fares for 2018 will increase above inflation as part of a longer-run approach of shifting the

balance of funding rail away from Government. A continued rebalancing towards the fare payer will become increasingly politically difficult. However, this increase also overlooks the very different performance of the different franchises in terms of subsidy. Figure 28 shows net funding positions for a sample of franchises. If the dark blue part of the bar is above the 0% line then operating the services requires subsidy. All of the infrastructure funding falls above the line (i.e. requires state funding). The bar shows whether the income from fares offsets the infrastructure costs. The only franchise which does this here is South Western with Thameslink and East Coast more or less breaking even (2% funding required). However, the GB average is 21% contribution and it is as high as 54% for ScotRail.

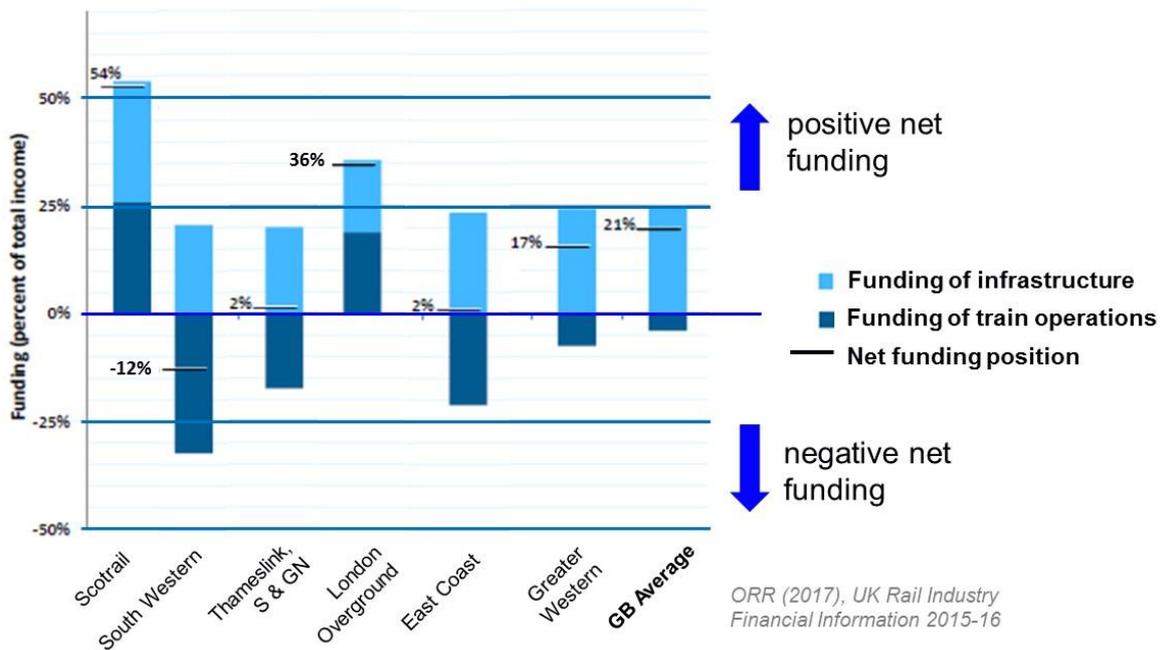


Figure 28: Net funding position of a sample of rail franchises (ORR, 2017a)

Overall then, despite a positive picture for national road and rail investment, there is the potential for shortfalls in funding which help deliver local and regional transport schemes and in particular to give authorities the opportunities to steer the sort of services they want to provide. Local road maintenance funding, relative to national, is a growing concern. It was suggested at the workshop on funding that there should be greater transparency on the requirements to fund and maintain the networks and operations we have today before further committing to capital expansion projects.

5.2.4. The changing way in which we pay for motoring

The improvements in vehicle engine technology necessary to begin the pathway towards meeting our climate change commitments have seen a 5% decline in the

amount of fuel consumed since the peak in 2007, despite a 3.1% increase in miles travelled. The Office for Budget Responsibility forecasts that fuel duties will decline as a percentage of GDP up to 2021/22 as shown in Figure 29.

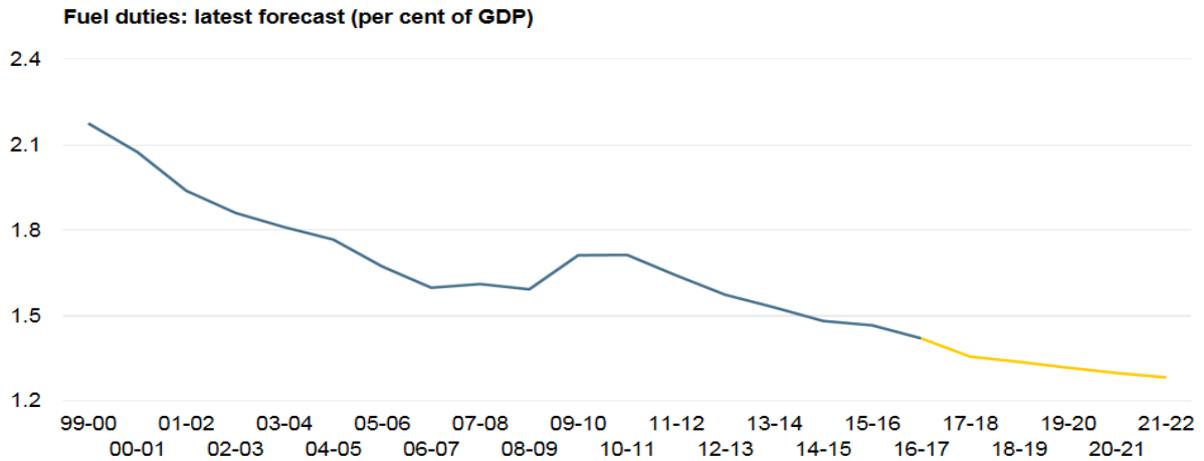


Figure 29: Fuel Duty Forecast as a percentage of GDP (source: Office for Budget Responsibility, n.d.)

It is important to note that fuel duty is not a hypothecated source of income for transport and any loss in revenue from fuel duty could be either accepted or alternatively filled by other tax adjustments. However, this trend still matters for transport in (at least) four ways:

- The sector has always made a case that it more than covers its costs and investment in transport therefore commands support, at least amongst motorists and the haulage industry;
- The demand for transport responds to price signals, with a short run elasticity estimate of -0.3 and long run of -0.6 (Goodwin et al., 2004). A fall in per-mile costs of travel would, all other things be equal, encourage more driving and therefore place greater pressures on the network for maintenance and investment.
- The demand for other modes of transport would fall if motoring becomes relatively cheaper as it has been observed to do since 2013 (TSGB, 2016).
- This loss will accelerate rapidly when there is a more rapid shift to electric and plug-in electric hybrid vehicles. Domestic electricity is currently only charged VAT at 5%. Latest analysis suggests that without any further policy intervention this would be between 2020 and 2025 for full electric vehicles and 2025 and 2030 for Plug-In Hybrid (Palmer et al., 2018).

It is a policy choice about whether and, if so, how to respond to this change. The decisions about how it is done and by whom are substantial governance challenges.

How will this work in different devolved administrations and will the relationship between local and national charging be considered? These issues do not arise with simple flat rate taxation at the pump. This issue will also be important to the freight industry as it will impact on fleet purchasing strategies and the relative competitiveness of multi-modal supply chains.

5.2.5. Other Issues

The four challenges set out above are not an exhaustive list of governance challenges in the transport sector just as the list of the strengths was also narrowed down. Each of the expert reports in the [Technical Annex](#) set out around three challenges that seem important. Many relate to specific modes or networks, and this is why they were not included in the overarching four topics. Some examples which, in the view of the authors, seem particularly worthy of further exploration include:

1. The regulation of new technology (particularly drones) which could be important for both the freight industry and also from an aviation perspective. There are also broader social implications at stake.
2. A source of uncertainty is the nature of Britain's future trading relationships. In terms of air transport, in the future the UK Government may have to assume greater responsibility for some or all of the following: regulatory formation and oversight, safety compliance and auditing, environmental safeguarding, airfield, airframe and aircrew licensing and certification, air service agreements with third party countries, and consumer protection and competition functions.
3. Continuing reforms to the road and rail sectors. In the case of road, DfT (2017d) announced that it would consult on plans to introduce a 'Major Road Network' for England. The MRN would comprise of local roads of strategic importance (for example key A roads) and it is proposed that this network could access a ring-fenced funding stream arising from the proceeds of Vehicle Exercise Duty (VED), in addition to Highways England's road network. Such a proposal is immediately confronted with the issues of a multi-level decision-making environment. Firstly, ownership of MRN roads which were local roads is proposed to remain with local authorities. However, decisions on investment will require input from various governance levels. This may be at City Region or Pan-Regional level, but also at the national level. On the rail network, recent announcements suggest that future franchises might have a more diverse set of arrangements with the potential for some vertical integration of track and operations (Grayling, 2017). Some of these reforms have been advocated previously (e.g. McNulty, 2011) but will still require the tension between local and regional governmental preferences and track and train operations to be managed.

6. What might change out to 2040?

This section looks ahead to 2040 and considers how the governance implications of the introduction of a set of technologies that include:

- ‘The shift towards ‘Mobility as a Service’ (MaaS), where individuals’ ownership of vehicles is increasingly replaced by “usership”, that is the ability to purchase access rights to an interoperable package of mobility services (car, taxi, bus, rail, bike share) owned by others, usually corporate, providers. This is facilitated by integrated aggregation and payment platforms, with intensive processing of ‘big data’ to match provision to demand in real time (see Thakuria et al., 2016);
- New user-generated and user-centred information that is context specific and integrates mobility and non-mobility options, and which draws upon crowd-sourced, real-time data (see Toole et al., 2015);
- Increasingly ‘intelligent’ infrastructure, including connected vehicles, which derives operational information from users and provides feedback in real-time to influence traveller behaviour and optimise system performance (see Alam et al., 2016);
- The electrification of the vehicle fleet using battery power, plug-in hybrid and/or other new technologies. Combined with a smart energy distribution grid, electric vehicles could be both emission free at the point of use and also be part of the electricity storage solution for the widespread adoption of renewables more generally in pursuit of decarbonisation objectives (see Coronado Mondragon et al., 2015);
- Automated vehicles that do not require ‘driving’ by any of the passengers, and which enable all occupants of the vehicle to focus on other tasks whilst they are in motion (see Fagnant and Kockelman, 2015, Docherty et al., 2017).

Some of these developments may be stand-alone but others will work in parallel, for example driverless taxis may be an important part of accelerating Mobility as a Service.

In looking at these technologies, this report draws on the description of the governance system and its strengths and challenges today. However, as the future is uncertain, this section should be seen as a set of evidence-based contentions rather than observable realities. Where possible we present options for action recognising that there is a spectrum of positions the state can adopt from more interventionist to more laissez-faire.

The section draws on a combination of workshop inputs from both project workshops and three additional expert reports which were commissioned following the workshops on Futures (Professor Iain Docherty), Automation (Professor Oliver Carsten) and Funding (Dr John Nellthorp). In different places throughout the [Technical Annex](#), the contributing experts have highlighted the importance of good

technical regulation and interoperability considerations for new technologies. This was identified as a strength of the UK governance system in section 5.1.4 and this report does not cover that further, although it is clearly important.

6.1.1. Reasons for state intervention

Before reflecting on how the advent of new technologies impacts on governance it is worth reflecting on why the state is involved in intervening in the transport market and, therefore, why it might still continue to do so or what might it do differently.

summarises the reasons for intervention and the issues which make those reasons relevant today. In reviewing the list however, it is difficult to see which of these issues will not continue to be important. The reasons for state intervention in transport are robust; it is the context in which they are delivered that is changing.

Table 5: Core Reasons for State Involvement in Transport Governance
(source: Docherty et al., 2018)

Need for intervention	Key Issues today
Public policy	
1. Setting overall direction of policy	Increasing recognition of the role of transport in supporting economic growth, social progress and health.
2. Environmental, economic and social externalities exist	Climate change, air quality, congestion, social exclusion and inequity are not tackled through the market.
3. Coordination of transport, land-use and economic goals	Planning to accommodate growth in many cities while maintaining or improving accessibility requires intervention.
4. Setting standards and communicating with public about transport system operation	Defining levels of service and reporting on how these are met, justifying efficient spending of taxation, managing disruptive events.
5. Balancing the needs of different transport systems and users	Decisions on infrastructure spend and maintenance, road space allocation and legal frameworks on rights.
Market failures	
6. Conditions for a free market do not exist	Managing monopoly infrastructure providers and limited service competition, preventing collusion.
7. Acting as a provider or procurer of services which are not profitable	Often to ensure basic levels of service to some communities, evening and weekend services or for bespoke services such as school or hospital transport.
8. Problems of co-ordination between modes exist	Competition can exist between public transport operators within and between modes. Limited ticketing integration.
9. Basic standards of operation and rules of movement	Interoperability between systems, data, standardisation of laws and enforcement.
Investment as policy	
10. Funding the provision and upkeep of infrastructure	Sets general taxes and mobility-related taxes and charges at various levels of government to fund the upkeep of infrastructure and subsidy of some services. The state can borrow at lower rates than the private sector.
11. Supporting the adoption of transport innovations	Innovations are sometimes expensive in their early stage adoption or require additional infrastructures, supported by state subsidy and investment or new regulation.
12. The state is an aggregator of risk and has primary accountability	The state ultimately remains guarantor when private provision of public services fails and retains accountability via the ballot box.

From a governance perspective, the list of innovations at the start of this section change a number of things:

- The network of actors and stakeholders involved in delivering transport
- The technologies and, therefore, operational rules for the transport system
- Who holds knowledge about what is happening in the transport system and therefore the power dynamics in the system
- The business models underpinning transport, the way it is paid for and who is involved in channelling that revenue
- The relationship between the user and the provider, and in turn the state, as users become more active participants in the transport system.

The following sections look at some of the implications of these changes, given the on-going need for state intervention.

6.1.2. The Old and the New

It is necessary to imagine what opportunities new technologies could bring, and this is discussed further below. The focus of the companies seeking to deploy new technologies is to try and realise some of these opportunities, but there is a much wider transition for the existing regime of actors and technologies that also needs to be managed (Geels, 2012).

For example, automation, particularly in the form of driverless vehicles, is likely to have very substantial wider impacts in the medium and longer terms (Turnball, 2015). These are likely to affect economic growth, energy use, social equity, liveable cities and living streets, access to employment, residential location choice, healthy lifestyles, sociability, travel intensity and mode choice. Effects that have been identified as potentially relevant include:

- competition with urban public transport, particularly buses;
- competition with rail for longer distance trips;
- increased intensity of motorised traffic;
- attractiveness of travel by motorised means which would result on decreased use of healthy modes (see Alermi et al. (2018) for early evidence from San Francisco);
- encouragement of long-distance commuting and urban sprawl; and

- substantial impacts on employment from the automation of freight transport and taxi driving. (see Wadud et al., 2016; Beede et al., 2017)

The UK Government wants to see driverless vehicles without a safety attendant on the UK's roads by 2021 (BBC News, 2017). If this comes to pass then the impacts of automation could begin, for example, to have an impact on the demand forecasts of rail franchises from the early 2020s. Such impacts should really be being discussed with the rail industry now and how to share any resultant revenue risk. Because many investments and decisions in transport have a long-term element to them it may be desirable to take a pro-active stance and confront some of the potential implications before they are actually observable.

While it seems necessary to organise much of the regulatory oversight of autonomous vehicles at a UK-wide scale, the vehicles will operate on local streets and, as such, there is scope for different local authorities to take different approaches as to how to manage this, as today with the current private car. It will be possible to restrict access to specific areas or to allow access to particular lanes or to charge differential rates for access at different times of day. Much as with the Swedish approach to congestion charging referenced in section 4.1.3, it would seem sensible to have common protocols to integrate local access management into autonomous systems even though the flavour and detail of the implementation will vary.

These are just two of the many issues which need addressing. How should planning respond? Will this radically change what travel to work areas look like and therefore the spatial scales over which it makes sense to plan for transport? Where might freight hubs relocate? There is currently an understandable focus on the governance arrangements to permit autonomous vehicles on the UK's roads. However, these seem likely to be the thin end of a much bigger wedge of associated impacts that will require adaptations to regulations or governance approaches.

6.1.3. Rethinking Regulation

The workshop explored four scenarios with different degrees of government intervention and different levels of technological progress. One common theme in each scenario was the need for government to present a refreshed vision of what regulation and policy intervention are for and also importantly, not for. There was consensus that our current complex combination of highly asymmetric governance models (section 4) and mixed public/private ownership of transport operations (section 3) was the result of a number of long-running and often independent and historically rooted processes. The potential for change inherent in smart mobility -in types of transport mode, service quality, distributional impact, pricing and so on - was so great that it was agreed that state would have to bring some kind of clarity to

its regulatory role. Without this clarity, the political economy of smart implementation might become very difficult to manage and could generate problematic externalities.

The advent of an autonomous pod provides a useful thought experiment. If such a vehicle is not owned by an individual then what sort of an asset is it? There is currently a distinction between private transport (e.g. your own car or motorbike) and public transport (e.g. bus, rail and taxi). A pod which is shared with other people might neatly fit in to the definition of what we currently see as public transport but how then would we class an individual travelling by themselves in such a vehicle? This is in effect the same as taking a taxi today but without a driver. Such distinctions matter to how roadspace is allocated and where subsidy is channelled in the system. Rather than bus and taxi lanes it might be preferable to switch over to management by occupancy (for which precedent exists with High Occupancy Vehicle lanes). There are also arguments for subsidy to follow the user or to be targeted to specific parts of the network (e.g. feeder taxi type services to mainline public transport, as has been trialled in the US (Linton and Bray, 2017) rather than to be channelled by mode.

Kamargianni et al. (2016) review the different stages of development of Mobility as a Service (MaaS). These services can involve, in their most developed forms, access to multiple modes with ticket integration, payment integration, booking and journey planning services and subscription-based models where you buy access to a pre-set amount of mobility as with a mobile phone data and calls bundle. As noted in sections 3 and 4, achieving an integrated transport system in the UK has proven difficult, partly because the markets have been established to be in competition. MaaS could change this or could be seen to be an opportunity to change aspects of the system which do not work today. Again, as a thought experiment, consider a city where MaaS has become widespread. The traveller's relationship will be with their MaaS provider as much as the specific modes they use. How many MaaS providers might there be and could they exert market power over the operators and the travellers? Should the MaaS providers be regulated and how would this change the regulatory framework for the existing providers? This might depend on how involved the state is in providing any of the services or in integrating the ticketing and so may look quite different in London where there is full control to somewhere like Huddersfield where there is limited scope for influence. Some cities are pro-actively planning for the mobility in their area to move towards a more on-demand MaaS-based model (see TfGM, 2017). Early engagement might have some benefits in overcoming barriers to the MaaS market developing, while setting a framework fit for purpose in the longer run if it becomes established. How anticipatory or how responsive governments should be is a dilemma. While intervening too early risks stifling innovation, intervention may also help overcome some of the longer-run barriers to integration identified throughout this report.

We note that Finland, rather than seeking to conduct such a reform from the start point of existing regulations, has created a new Transport Code which seeks to be technology neutral and to create a level playing field across modes (Berner, 2017).

Finally, although public transport and aviation have deployed peak pricing to various degrees for a long time, this has also emerged more clearly in urban transport with surge pricing from Uber. As well as thinking through how technology allows for new or different ways of pricing, consideration also needs to be given to protecting the public interest. Transport markets are still likely to concentrate on the most dense areas so there is an on-going need to think about how to ensure sufficient access to mobility and to consider the case for intervening to limit prices for consumer protection. There will be a need to continue to correct for imperfections in the transport market and to protect low-income groups but these needs will likely change with the market.

6.1.4. Managing the Use of Roads

Early assessments of autonomous vehicles and integrated mobility as a service options have a very wide range of potential outcomes associated with them. For example, an assessment of the potential impact of AVs in travel demand in the US showed a range of +5% to +60% (Wadud et al., 2016). The International Transport Forum have been evaluating the impacts of a shift to on-demand mobility system linked to mainline public transport in an urban context (ITF-CPB, 2015). Here, the outcomes vary radically with the assumptions made about whether all or just some people sign up to the system and whether the vehicles are used by individuals or shared (see **Table 6**). The best outcome is an increase in traffic-kilometres of 9% while the worst case is an increase of 103%.¹³

¹³ In general there is a reduction in the vehicle fleet size. In many scenarios congestion is reduced due to more effective use of space and the increase in kilometres is in part due to the distances travelled to relocate vehicles.

Table 6: Peak Hour Traffic Volume Changes in Lisbon under different Autonomous Taxi Futures (ITS-CPB, 2015)

Change in Fleet	Scenario	Car kms (million)	% of Baseline
0% self-driving cars	Baseline	1.04	
100% shared self-driverless fleet	With ride sharing and high capacity public transport	1.13	109%
	Vehicle but not ride sharing no high capacity public transport	2.11	203%
50% private car use for motorised trips	With ride sharing and high capacity public transport	1.35	136%
	Vehicle but not ride sharing no high capacity public transport	2.04	197%

The International Transport Forum (ITF) conclude that governance reforms to how the transport system is managed are critical to ensuring that the benefits of these new technologies accrue to everyone, including non-users, and do not lead to a deterioration of conditions. In particular, the lessons from their exercise suggest a need to:

- ensure integration rather than competition with mainline public transport
- put in place measures which ensure that a more shared rather than individualised model emerges
- in parallel put in place measures to change the way streets are managed to reflect the reduction in need for parking and the increase in drop offs and pick ups.

This immediately suggests that there would need to be a common approach to managing such a system across a whole conurbation. As noted earlier (Linton and Bray, 2017), there is currently a fragmented approach to taxi and private hire regulation which would need to change.

The ITF report also implies a more interventionist approach to ensuring integration across modes. While this is possible, it has proven difficult within the UK’s existing modal structures with notable exceptions (London and Northern Ireland in particular). There are other approaches which could be used to manage the use of roadspace and incentivise the sorts of outcomes authorities wish to see. Participants at the workshop saw the potential for new technologies to allow changes to be made to the

allocation of roadspace across the day as well as between modes and for there to be a different approach to charging for access to different areas (see below). Although it is too early to say what the impacts of new technology will be on travel patterns and use of vehicles, initial results suggest that a laissez-faire approach could lead to undesirable outcomes.

6.1.5. Funding of and Paying for Travel

Section 5.2 discussed the current divergence in how we pay for travel between modes as well as a likely decline in revenue from fuel duty. A shift towards autonomous vehicles will also impact on parking revenue which has been growing and currently yields a net profit for local authorities of £819 million (Leibling, 2017).

Both workshops identified a need to fund additional costs of establishing new infrastructures or strengthening and improving existing infrastructures (local electricity grids and roads) to allow the deployment of both autonomous (Johnson, 2017) and electric vehicles (Chestney, 2017). There would also be new on-going costs to be considered in running these systems. Different options exist for funding this:

- general taxation – which would imply either a greater spend on transport or a redistribution of spending priorities within transport
- household electricity bills – in the case of electric vehicle grid strengthening which would be paid by all households irrespective of whether or not they had an Electric Vehicle (EV)
- user charges – where those using the facilities pay a premium to recover the costs of the additional provision.

In reality a mix of all three may be necessary. Discussion at the funding workshop suggested that putting the whole burden on user charges would stifle acceleration in adoption which, in the case of EVs, would impact on progress towards climate change targets. If there is a desire to see EVs form part of the grid and to be used as storage then this will require a reform to some domestic energy tariffs. Similarly, there would be a desire to discourage drivers or fleets from all charging at existing peak periods which might be influenced by dynamic pricing.

As noted in section 5.2.4 there are economic arguments to reform the way we pay for travel to ensure that the benefits afforded by new technology are not lost to a system where users face, to an even lesser extent than today, the true costs of moving around the network. The National Infrastructure Commission, in its 2017 consultation on infrastructure priorities examined the route to meeting congestion, capacity and carbon goals. It concluded that ‘effective long-term policy to manage

congestion will need to incorporate pricing for roads' and that a new pricing system was essential in reforming how we pay for roads (NIC, 2017, p. 74). The choices that are made about whether, when and how to reform how we pay for travel and how we will pay for the development and maintenance of the new infrastructures are very important.

6.1.6. Who does what?

A theme across this report has been the complexity of the governance arrangements for transport. There will continue to be strong arguments for aggregation of responsibilities at a pan-UK level to ensure effective safety and interoperability regulation of new systems, but beneath this the governance system is complex and it is less clear who should be responsible for what regarding different aspects of the new technologies.

To help answer this question we observe that one of the major challenges facing the governance of transport is a diminishing resource base and staff with the skills necessary to plan for transport. Coupled with this is a growth in the range of skills sets necessary to be an intelligent client to tech companies and to manage an increasingly complex set of networks and technologies. While not all of this needs to be done by the public sector, the public sector will retain accountability for the decisions taken and therefore needs to be an informed and intelligent client. At this point therefore we can observe that the limited passing up of powers from lower tiers to larger area bodies is a potential problem. Rather than seeking to regulate PHVs at a city-wide level this remains at the districts. Would that be tenable with autonomous fleets of taxis? Similarly, only TfL has highways powers for a Strategic Road Network in its area. Will all local highways authorities have the skills and competencies to manage the transition to autonomous vehicles or could this be done more effectively and more cheaply by pooling teams and resources?

Rather than seeking to answer the question of who does what here, we suggest that different tiers of governance need to work together, and with the private sector, to determine the advantages and disadvantages of holding competencies and responsibilities at different scales. It would seem sub-optimal if the transition in technology to 2040 was not accompanied by a change in the structures supporting that transition. The current structures were fixed well before these new opportunities emerged and may not be well aligned for their governance.

6.1.7. Data

We note here that while data emerged as an important issue in our workshop in York on 27 November 2017, the scope of the brief and time available meant we are only

able to flag this as a critical part of the governance debate. The future transport system will revolve around large amounts of data about personal users being exchanged between providers. These are challenging in their own right in terms of appropriate use and storage of such data and its on-going security. If such systems are to become integrated with public sector services such as health or social care for example then this becomes yet more challenging. We suggest that this is a major need for further consideration.

6.1.8. Summary Reflection

Looking out to 2040, new technologies appear to offer some significant transformative potential for the transport system. The different aspects reviewed in this section underline the importance of thinking about possible 'end states' in order to determine whether they are desirable. However, to reach any of these end states requires more thinking about how to govern the transition. The current complex of highly asymmetric governance models (section 4) and mixed public/private ownership of transport operations (section 3) was the result of a number of long-running, often parallel developments.

The smart mobility transition is an opportunity to remove or improve some of the challenges that the current structures create and to achieve goals which have shown to be difficult with the existing technologies, structures and incentives. However, doing this will be challenging as the exact timing, speed and nature of the changes are unclear and the new challenges seem set to come in parallel to, but could also impact on, the existing ones. The experts informing this report suggest that, without clarity about the regulatory role of the state and the position of the different authorities in managing different parts of the transition, delivering the benefits of smart mobility will be difficult and there may be some unwanted and difficult-to-manage downsides. We note that Finland has taken a pro-active approach to 'rebooting' the way in which it defines and manages transport operations. This, to us, seems like a useful model to consider. While it is not possible to say exactly how the smart mobility transition will happen, it should be possible to develop anticipatory regulation which provides:

1. certainty to new technology providers about the rules of the game; and
2. the necessary tools for government at various levels to steer the new technologies to serve the public good as well their own business needs.

To do this would also require developing more of a public discussion as to what these technologies are for, why they might be beneficial and what the level of public support for different types of deployment might be. This is not currently happening (Hopkins and Schwanen, 2018).

The experience with the current transport system as well as the input of experts to our workshop and internationally (Marsden and Reardon, 2018) suggests that the stance which the state adopts will make a difference both to the pace and nature of the mobility system that emerges. For example, while fully integrated MaaS services promise integrated door-to-door journey experiences, this is not guaranteed. MaaS could instead mean having access to a range of modal options but for the system to function more or less as today with much more limited integration.

Electrification of the vehicle fleet is likely to continue to need skilful and adaptive governance approaches to achieve the scale of ambition which the Government has set. Substantial electrification can occur without this pro-active approach but our workshops suggested there will be limits and increased risks of stranded assets and poor investment decisions. This suggests the need for a clear vision about the Future of Mobility around which the kind of regulatory framework suggested above is developed. Such a vision would best be developed taking account of the views of stakeholders at different spatial scales given the importance of devolution to the management of transport. It is here where attention could also be paid to 'who does what'.

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Annex A: Differences in National and Local Transport Responsibilities

Scotland (see http://www.parliament.scot/ResearchBriefingsAndFactsheets/S5/SB_16-55_Transport_in_Scotland.pdf)

Service	UK Government (Reserved functions)	Transport Scotland (an Executive Agency of the Scottish Government)	Local authorities (powers may be implemented via Regional Transport Partnerships if LAs agree)
Road network	<ul style="list-style-type: none"> The UK Government retains responsibility for road traffic law*, vehicle and driver licensing and taxation, public service vehicle operators and goods operators licensing and the regulation of road safety. Driver and Vehicle Licensing (DVLA) Traffic Commissioners (appointed by UK Secretary of State) 	<ul style="list-style-type: none"> Development, maintenance and management of the trunk road network Speed limits and road signs devolved under Scotland Act (2016) <p>*Exempted from reservation in road traffic law are sections 8 and 11 on drink drive limits [devolved in 2012]; sections 39 and 40 (relating to road safety and training); and sections 157 to 159 (relating to payments for treatment of traffic casualties) of RTA 1988.</p>	Manage, maintain and enhance local highway network (including traffic signals and signs)
Bus services	<ul style="list-style-type: none"> Bus operator licensing and enforcement, which is mainly provided through the offices of the Traffic Commissioners and associated agencies. 	<ul style="list-style-type: none"> Sets policy framework for the provision of bus services in Scotland. Administers and funds the national concessionary fares scheme for elderly and disabled people (under Transport (Scotland) Act 2005 and provides other funding streams for the provision of local bus services, e.g. bus service operators grant. 	<ul style="list-style-type: none"> Provision of bus infrastructure, e.g. bus shelters and bus priority measures. Provision of subsidies for socially necessary, non-commercial bus services. Transport (Scotland) Act 2001 enables LAs to create statutory bus quality partnerships.

<p>Rail services (incl. light rail)</p>	<ul style="list-style-type: none"> • Oversight of Network Rail, which is a GB-wide company wholly owned by the UK Secretary of State. • Letting and management of cross-border passenger rail franchises (excluding the Caledonian Sleeper services), which extend into Scotland. • ORR retains regulatory oversight of rail services in Scotland. 	<ul style="list-style-type: none"> • Letting, management and financial support of the ScotRail and Caledonian Sleeper franchises. Under Scotland Act (2016), Scottish Government is able to invite public sector bids for its rail franchises. • Setting the high-level strategy for the maintenance and enhancement of the Scottish rail infrastructure by Network Rail via the Scottish HLOS and SOFA. • Specification of and funding for maintaining and operating rail infrastructure in Scotland via Network Rail. <p>Light rail etc. systems (such as the Edinburgh Tram and Glasgow Subway) are devolved and extension plans etc overseen by Scottish Government/Parliament</p>	<ul style="list-style-type: none"> • Consultees on rail developments. Influence on rail projects via the planning system.
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Wales (including substantial changes to the devolution settlement under the Wales Act (2017), which comes into force 1 April 2018, see <http://www.legislation.gov.uk/ukpga/2017/4/contents/enacted>)

Service	UK Government (Reserved functions)	Welsh Government	Local Authorities
Road network	<ul style="list-style-type: none"> • The UK Government retains responsibility for road traffic law, vehicle and driver licensing and taxation, public service vehicle operators and goods operators licensing and the regulation of road safety. • Driver and Vehicle Licensing (DVLA) Traffic Commissioners (appointed by UK Secretary of State) 	<ul style="list-style-type: none"> • Development, maintenance and management of the trunk road network. • Speed limits and road signs devolved under Wales Act (2017). 	<p>Manage, maintain and enhance local highway network (including traffic signals and signs).</p>
Bus services	<ul style="list-style-type: none"> • Bus sector regulation including competitive model and activities of the Traffic Commissioners and associated agencies. 	<ul style="list-style-type: none"> • Sets policy framework for the provision of bus services in Wales. • Provides other funding streams for the provision of local bus services, e.g. bus service operators grant. • Registration of bus services to be devolved under Wales Act (2017). 	<ul style="list-style-type: none"> • Provision of bus infrastructure, e.g. bus shelters and bus priority measures. • Provision of subsidies for socially necessary, non-commercial bus services.

<p>Rail services (incl. light rail)</p>	<ul style="list-style-type: none"> • Oversight of Network Rail, which is a GB-wide company wholly owned by the UK Secretary of State. • Funding for Network Rail activities in Wales. • Letting and management of cross-border passenger rail franchises e.g. Great Western. • ORR retains regulatory oversight of rail services in Wales. 	<ul style="list-style-type: none"> • Letting, management and financial support for rail services wholly within Wales devolved under Wales Act (2017). 	<ul style="list-style-type: none"> • Consultees on rail developments. Influence on rail projects via the planning system.
<p>Other transport services and infrastructure</p>	<p>Aviation and shipping</p>	<ul style="list-style-type: none"> • Allocates funding for major transport schemes, services or funding competitions from devolved budget • Active travel infrastructure (e.g. cycling facilities) associated with trunk roads. • Some aspects of ports management devolved by Wales Act (2017) • Sets the policy framework for walking and cycling. • Wales Act (2017) gives Welsh Government power over taxi and private hire licensing. 	<ul style="list-style-type: none"> • Deliver transport projects, usually through third party contractors. • Infrastructure for pedestrians and cyclists. • Parking services.

Northern Ireland (see <https://www.gov.uk/guidance/devolution-settlement-northern-ireland>)

Service	UK Government ('Excepted' and 'reserved' functions)	Northern Ireland Executive	Local Authorities
Road network	The Northern Ireland Executive has 'full legislative powers' for transport including roads.	<ul style="list-style-type: none"> The Department for Infrastructure (DfI) has overall responsibility for transport policy and planning in Northern Ireland. These policies are delivered by <u>TransportNI</u>, a business unit within the DfI which is, in effect, the roads and public transport authority in Northern Ireland. 	Local authorities in Northern Ireland have no statutory responsibilities with regard to transport policy and planning.
Bus services	The Northern Ireland Executive has 'full legislative powers' for transport including road transport.	<ul style="list-style-type: none"> The vast majority of public transport services are provided by the subsidiary companies of the Northern Ireland Transport Holding Company (NITHC) =- a statutory body (public corporation) established by the Transport Act (Northern Ireland) 1967 to oversee the provision of public transport in NI. The three subsidiary companies, Citybus (which operates Metro bus services), NI Railways and Ulsterbus, have operated under the overall brand-name of Translink since 1996, although the companies are separate legal entities. 	Local authorities in Northern Ireland have no statutory responsibilities with regard to transport policy or planning.

<p>Rail services (incl. light rail)</p>	<p>The Northern Ireland Executive has 'full legislative powers' for transport including railways.</p>	<p>The vast majority of public transport services are provided by the subsidiary companies of the Northern Ireland Transport Holding Company (NITHC) - a statutory body (public corporation) established by the Transport Act (Northern Ireland) 1967 to oversee the provision of public transport in NI. The three subsidiary companies, Citybus (which operates Metro bus services), NI Railways and Ulsterbus, have operated under the overall brand-name of Translink since 1996, although the companies are separate legal entities.</p>	<p>Local authorities in Northern Ireland have no statutory responsibilities with regard to transport policy or planning.</p>
<p>Other transport services and infrastructure</p>	<p>Aviation and shipping are reserved to the UK Government.</p>	<ul style="list-style-type: none"> • Dfi also has responsibility for vehicle registration, road safety and driver and vehicle licensing functions. • Allocates funding for major transport schemes, services or funding competitions from devolved budget • Active travel infrastructure (e.g. cycling facilities) associated with trunk roads. <p>Sets the policy framework for walking and cycling.</p>	<p>Local authorities in Northern Ireland have no statutory responsibilities with regard to transport policy or planning.</p>



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