Department for Transport

Transport Investment Strategy

Moving Britain Ahead

July 2017

Transport Investment Strategy

Presented to Parliament
by the Secretary of State for Transport
by Command of Her Majesty

July 2017

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Contents

Executive Summary 6

1. The case for continued investment in our transport infrastructure 11

2. The need for a transport investment strategy 21

3. Our strategic priorities and propositions 27

4. Taking the decisions that will deliver better transport across the country 40

5. How we will deliver: innovation and action 58

Executive Summary

This Government's plan for Britain is a plan to build a stronger, fairer country, with an economy that works for everyone, in which wealth and opportunity are spread across the country and we are set up to succeed in the long term.

Earlier this year, we outlined a critical part of this plan for post-Brexit Britain. Our Industrial Strategy will see Government stepping up to back businesses to invest for the long term. It involves building on Britain's strategic strengths and tackling our underlying weaknesses, creating the conditions where successful businesses can emerge and grow. Its objective is to improve living standards and economic growth by increasing productivity and driving growth across the whole country.

High performing infrastructure can enable delivery of the Industrial Strategy. By maintaining and upgrading our transport infrastructure – an integrated network that underpins not only our daily lives but our economy too – we can connect communities and businesses and help deliver balanced growth across the country.

We have already made substantial progress in recent years, allocating more than £61bn in capital investment over the five years to 2020/21, backed by reforms to put the planning of that investment on a stable basis, providing funding certainty and clearer long-term direction. We have taken big decisions to take forward transformational projects like the A14 and HS2 and announced that our preferred scheme for meeting the need for additional airport capacity in the south-east of England is a new north-west runway at Heathrow Airport. We have also held a public consultation on a draft Airports National Policy Statement. At the Autumn Statement we made available an additional £2.6 billion as part of a National Productivity Investment Fund. This includes an extra £1.1bn for local transport and £220m for national roads, to fund smaller projects that can quickly and directly tackle congestion and improve local productivity.

In this Transport Investment Strategy we set out how we will build on that progress and – through the investment decisions we go on to take – how we will respond realistically and pragmatically to today's challenges, driving progress towards fulfilling the aims of our Industrial Strategy and putting the travelling public at the heart of the choices we make.

Through our investment we can and must seek to:

- **create a more reliable, less congested, and better connected transport network that works for the users who rely on it;**
  Our intensively used networks are ageing and face increasing demands, creating delays and undermining reliability. In places they don't provide the connections people and businesses need.

- **build a stronger, more balanced economy by enhancing productivity and responding to local growth priorities;**
  Our national productivity lags behind other countries and prosperity hasn't been shared evenly between different places, leaving some communities feeling left behind.
- **enhance our global competitiveness by making Britain a more attractive place to trade and invest;**
  Our long term success in a globalised world will depend on our ability to attract job-creating investment in our industrial strengths and to trade as frictionlessly as possible with partners old and new.
- **support the creation of new housing.**
  We face an immense challenge to provide the houses that people need in the places they need them. As the Government's Housing White Paper recognises, transport infrastructure is one of the keys to unlocking development and delivering places people want to live.

In doing so we must take account of the various factors that, given the scale of our ambition, influence the way in which we respond. We need to live within our means and ensure that we can deliver an extensive programme consistently and effectively. We need to safeguard our environment and health. We need to prove adaptable in the face of considerable uncertainty and rapid change. And in responding to these factors we need to seize the presented opportunities to improve living standards and drive economic growth.

Taken together this will mean investing in our transport network in different ways, most fundamentally by addressing the network's core capability – its condition, capacity and connectivity – but also improving the user experience and adapting the network to safeguard our environment and health.

And as we shape and deliver the balanced investment programmes that will realise our goals we will:

Ensure our investment consistently meets the needs of users and helps to create a balanced economy: by focusing on schemes that tackle clearly-defined problems or unlock specific opportunities; ensuring decisions reflect a clear understanding of the distinctive needs and circumstances of different parts of the country; taking account of the balance of spending between different regions and developing a new way of assessing projects for the contribution they make to creating a more balanced economy; and being open-minded about the best way to tackle particular problems across different modes.

Focus on getting the best value out of the network and our investment: by continuing to prioritise value for money and rigorous business case appraisal; ensuring we are getting the most out of our existing asset before investing; sharing the burden of funding with those who stand to benefit; seeking to unlock opportunities for private finance where it meets our objectives.

Retain a resolute focus on delivery: by continuing to prioritise predictable funding and a stable long-term pipeline of projects; taking a realistic approach to delivery challenges and exploring the new approaches to deliver outcomes more quickly and efficiently; favouring projects which deliver for users quickly and at lower cost and risk.

Remain adaptable in the face of change: by seeking balance and diversity across the investment portfolio; and expecting investment projects to put the UK at the forefront of adopting future technology.

Our Industrial Strategy recognises the importance of driving growth across the whole country and creating the right institutions to bring together sectors and places. To deliver our aims we are creating strong **institutional decision-making frameworks**:

Transport is substantially devolved in the UK, with differing devolution settlements in Wales, Scotland and Northern Ireland. For example, rail investment is devolved in Scotland and Northern Ireland but reserved in Wales. As a result, this Strategy is focussed on capital investment for which the UK Government is responsible. However, we work closely with the Devolved Administration on important decisions, especially where there are cross-border impacts and an opportunity to build a better transport network across the UK. Our investment in current long-distance rail infrastructure, for example, such as the East and West Coast Main Lines, and in HS2 – although in England – has a major impact on reducing journey times from London to Scotland and on increasing the ease of connectivity to North Wales.

At the **local level**, we will continue to rely on devolved decision-making which puts power in the hands of local communities, backed by funding. Our local transport networks allow communities to flourish and power our city economies. Where local authorities come together to form combined authorities with an elected mayor, we are supporting these through bespoke devolution deals that provide greater freedoms and powers. And we are supplementing devolved funding with specific investment on a competitive basis, both for larger projects across the country which are too big to fund locally, and for projects which deliver national priorities, such as the local transport schemes within the National Productivity Investment Fund, or schemes which encourage cycling and walking. Where appropriate, we will offer targeted support to local authorities to develop their bidding and delivery capability, to ensure that all areas have the potential to produce high quality bids and can realise the benefits that strong projects will unlock.

We are committed to driving economic growth in our cities and towns outside London, but to achieve the best results we know that they cannot work in isolation. We therefore welcome the **regional** partnerships that are forming in different areas, like Transport for the North. These Sub-national Transport Bodies (STBs) enable areas to come together and speak with one voice on strategic transport planning in order to boost economic growth and development. While each will vary, in this document we set out the core functions we consider STBs should have, including advising the Secretary of State about the development and prioritisation of transport investments in their region. This represents a fundamental change, opening up central government decision making to ensure that infrastructure investment takes account of regional transport strategies and contributes towards rebalancing the country's economy.

The easy movement of people and goods around and between our regional economies relies heavily on our roads. While our reforms have successfully put in place planning and funding certainty and a rigorous performance regime for our nationally-managed Strategic Road Network, we don't want the important network of locally-managed A-roads to fall behind. Later this year we will consult on proposals for creating a 'Major Road Network' ('MRN'): a designated network reaching all parts of the country. The MRN would form a middle tier of our busiest and most economically important local authority A roads, sitting between the national SRN and the rest of the local road network. As part of this

consultation we will make proposals to allocate a proportion of the National Roads Fund to the MRN.

Alongside local transport, STBs will play an important new role in shaping the investment strategies for our **national road and rail** networks. Having reformed the way we plan and fund investment on the nationally-managed Strategic Road Network, we are now mid-way through the first five-year £15bn Road Investment Strategy and have started planning for the second period beyond 2020. We are making good progress in tackling some of the most notorious bottlenecks on the network, like the A14 and A303 and adding 1,300 miles of new lane capacity to cut congestion and smooth journeys on the most heavily trafficked sections. As well as the formal input from STBs, the next Road Investment Strategy will be informed by a structured, comprehensive programme of engagement with Local Enterprise Partnerships and closer working with local planning authorities. On the rail network, the current five-year investment period comes to an end in 2019. Later this year we will set out our plans for structuring the decision-making framework for infrastructure change the next investment period. Work will soon start on the construction of HS2 Phase One. HS2 will be the world's most advanced passenger railway and the new backbone of our rail network.

People and businesses need not only to get around their communities, and across the country, but to connect with the rest of the world as well, through our **international gateways**. As an open, competitive, trading economy, our success is closely tied to our connections with the rest of the world, made through our airports and seaports, both at the level of major international hubs and the regional ports that feed them, as well as through our rail link to the Continent via the Channel Tunnel. While the majority of our ports and airports are owned and operated in the private sector, Government has a responsibility for ensuring that they are connected up to the existing national networks and that those networks are able to handle the road and rail traffic they generate.

Future investment rounds will be informed by the development plans of ports and airports themselves, and the priorities of the regional bodies who best understand their regional networks. We are also conducting a maritime Port Connectivity Study to assess the potential need for new inland transport capacity or connectivity, and developing a new Aviation Strategy that will set out the Government's vision for the wider aviation sector, including surface access. This will replace the 2013 Aviation Policy Framework and will be subject to a separate consultation process.

Getting to the right decisions is made possible by a robust project **appraisal process**. While our existing Transport Appraisal Guidance framework is considered among the most developed in the world, we are continuously looking to improve it. In particular, we have made recent changes to strengthen our ability to measure a scheme's local economic impacts, assess the benefits of resultant housing growth and capture the structural changes in the economy which result from step-changes in capacity and connectivity. We are also committing to develop a new 'rebalancing' assessment toolkit, for use as part of the strategic assessment of future investment programmes. In *Building our Industrial Strategy* the Government committed to taking account of the balance of spending per head between different regions. In addition, working alongside partners in Government, the Department for Transport will develop a new assessment standard that will require investment programmes to be judged on how they contribute towards creating a more balanced economy, as part of the overall assessment of their strategic case.

While these decision-making frameworks will help us to create a transport network that can deliver our aims, we also need to respond with **innovation** to the challenges and opportunities presented by funding and delivery pressures, environmental factors and the rapid pace of change.

In the final chapter of this document, we set out how we are embracing the opportunities presented by new technologies and positioning the UK as a world leader in transport technology; extending our financial reach by exploring alternative sources of funding, private finance models, and cost efficiencies; and overcoming delivery constraints through the use of innovative delivery models and concerted action to support the UK supply chain and skills base. All of these innovations can support our Industrial Strategy, building on Britain's strategic strengths, tackling our underlying weaknesses and creating the conditions where successful businesses can emerge and grow. Properly harnessed, they can help us meet our aim to improve living standards and economic growth by increasing productivity and driving growth across the whole country.

1. The case for continued investment in our transport infrastructure

This is a hugely important period for the United Kingdom. As we prepare to leave the European Union and redefine our place in the world, we must ensure that the decisions we take now maximise Britain's future potential and help to build a strong, fairer economy that works for everyone.

As we set out in *Building Our Industrial Strategy,* our plan will see government stepping up to back businesses to invest for the long term, building on Britain's strategic strengths and tackling our underlying weaknesses, creating the conditions where successful businesses can emerge and grow. Its objective is to improve living standards and economic growth by increasing productivity and driving growth across the whole country.

One of the core components of this Industrial Strategy is creating the economic infrastructure that will allow us to achieve these objectives, including by maintaining and upgrading our transport infrastructure, an integrated network that underpins not only our daily lives but our economy too.

The transport network underpins our daily lives and economy

1.1 We need to put the travelling public at the heart of our transport choices. Every person in Britain has a stake in the quality of our transport infrastructure. We depend on the network for our journeys to work or school in the morning, to reach customers and clients, do our shopping, look after our families, and see friends.

1.2 Whether or not we regularly drive, or take the train, the services we access daily are made possible by the billions of commuter journeys that take place each year, while nearly every product we buy will at some stage form part of the 1.7 billion tons of freight carried annually on the strategic road and rail networks[1]. We rely on global connections through our international ports and airports to keep our shelves stocked and our factories supplied; and to connect our businesses to new markets and opportunities overseas.

1.3 When well managed and maintained, the transport network is a powerful national asset and a cornerstone of our prosperity. That's why in recent years we have taken a number of fundamental decisions about the future capability of the transport network: building HS2 to transform the rail network with a huge step change in capacity; putting investment in our roads on a stable, well-planned footing; and taking steps to secure our status in the global aviation market by announcing our commitment to airport expansion in the south-east of England via

[1] 2015 figure. DfT Table TSGB401 – Domestic Freight Transport, by Mode

our preferred scheme at Heathrow, and holding a public consultation on a draft Airports National Policy Statement.

1.4 It's also why we established the National Infrastructure Commission (NIC), to provide Government with expert, impartial advice on the country's economic infrastructure needs over the long term, including transport. Later this summer, the NIC will set out the first stage of the National Infrastructure Assessment (NIA), publishing its 'vision and priorities'. In 2018, the completed NIA will, for the first time, take a comprehensive view of Britain's long term infrastructure needs out to 2050 and make associated recommendations to Government.

1.5 That assessment will be pivotal in informing future decisions about the shape of the transport network. But there are decisions and actions that need to be taken soon: as with any asset, the transport network needs continuous stewardship, particularly through times of change. The decisions we make now will shape the network for decades to come, and determine the contribution that transport can make to our national success and wellbeing.

1.6 Getting these decisions right is crucial. In this document we set out what we are trying to achieve through our investment in transport infrastructure, the priorities and propositions that will guide future investment decisions, the institutional frameworks within which those decisions will be taken, and actions we are taking to help us meet our ambitions.

What we can achieve through investment

1.7 What we are trying to achieve through investment is shaped by the specific national challenges we face today. Addressing these challenges will guide our priorities for future spending.

i) Users need a transport network that works, wherever they live.

1.8 By global standards, our existing networks are mature and generally offer good connections between our towns, cities, and international gateways. But in some cases they were built decades ago, and have sustained rates of use for which they were never designed. Routine maintenance is no longer enough on Victorian railways and where road structures are reaching the end of their design life.

1.9 The strength of our economy has led to much higher travel demand. Demand for rail travel has more than doubled over the past twenty years, from 800 million journeys every year to over 1.7 billion[2]. On our roads, the number of vehicle miles driven in the UK has risen by nine and a half times since 1950[3]. While the road network in Britain has grown just 3% in length since 1993[4], it now carries 23% more traffic.

1.10 We need to keep striving for better quality infrastructure. The World Economic Forum Global Competitiveness Index scores on the quality of infrastructure show that the UK typically ranks above the OECD average, but below our G7 competitors. Such surveys can offer a useful insight into our relative performance

[2] DfT Table TSGB0102 (2016) – Passenger Journeys on public transport vehicles from 1950
[3] DfT Table TRA0101 (2017) – Road traffic (vehicle miles) by vehicle type in Great Britain
[4] DfT Table RDL0103 (2016) – Road lengths (miles) by road type in Great Britain

on a global scale. But transport is a customer service business, and the experiences of those who use and rely on the network offer the best guide to the challenges we face. While different people and businesses, across different areas and demographic groups, use the network for a variety of reasons they have consistent views on what they need from the network.

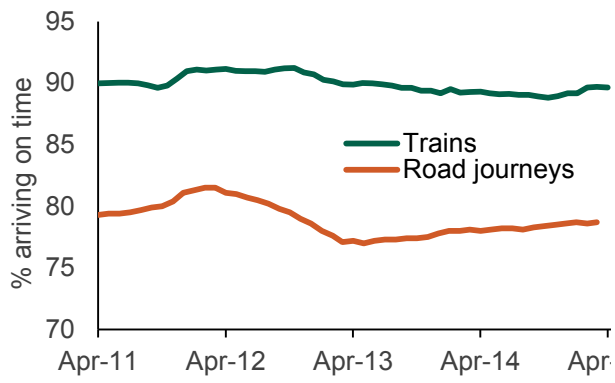
A network that is reliable, well-managed, and safe

1.11 Whatever the reason for their journey, the travelling public and businesses need to be able to predict with confidence how long trips will take, and when services will be operating. While most accept occasional delays, people expect to be able to plan ahead and make informed choices based on clear, timely, and readily-available information. They expect planned disruption to be minimised, and works to be carried out efficiently. With modern technology this should be and is possible.

1.12 Services on our major networks are generally reliable, with 90% of trains[5] and 79% of road journeys[6] arriving on time in 2014/15. But user expectations are rising and we need to work even harder to improve customer satisfaction levels which in some cases have either stalled or seen decline (fig 1.1 and 1.2).[7]

Fig 1.1 Journey time reliability

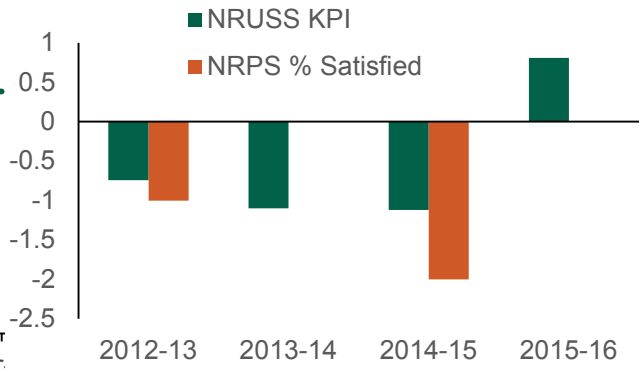
Strategic road and rail



Source: DfT, Office of Rail and Road

Fig 1.2 Change in user satisfaction, 2012-16

Road (NRUSS) and rail (NRPS), indexed to 2007



Source: National Road User Satisfaction Survey and National Rail Passenger Survey

1.13 Our transport networks have very high standards of safety. The UK railway continues to have the best safety record of the ten largest European railways, and a long-term decline in accident rates now place our roads among the safest in Europe, second only to Sweden[8]. But we cannot afford to be complacent, and sustaining our safety record will require continued investment in the upkeep and enhancement of safety systems and the network itself.

1.14 Investing to maintain and renew our infrastructure is also central to creating a network that is reliable. Without it, ageing networks are more likely to succumb to the effects of wear-and-tear or adverse weather. As technical faults mount up, repair costs escalate, and delays become increasingly severe and unpredictable. Those delays cause considerable frustration, which is only exacerbated when the provision of information is poor.

[5] Office of Rail and Road – A commuter/long-distance train is defined as 'on time' if it arrives within 5/10 minutes of its scheduled time
[6] DfT CGN0104 – An 'on time' journey is defined as one completed within a set reference time, drawn from historic data on that particular section of road
[7] National Road User Satisfaction Survey and National Rail Passenger Survey
[8] RSSB Annual Safety Performance Report 2015/16, and DfT Transport Statistics Great Britain, 2016 Table TSGB0809

Journeys that are smooth, fast, and comfortable

1.15 For the vast majority of journeys, transport is a means to an end. People therefore want journeys to be as quick, easy and reliable as possible. Access to services needs to be physically easy, and users need to trust that the services will meet their needs. Users understand that there will be times when the networks are busy, but they view persistent or severe congestion as unacceptable.

1.16 As our economic recovery continues and our new partnership with the European Union takes shape, transport demand is expected to keep growing. While we cannot predict the future with certainty, our forecasting is based on a range of analysis of the drivers of travel demand, designed to anticipate trends and to reflect those uncertainties. Under our current projections, for example:

- By 2040 traffic on England's roads is forecast to increase by between 19% and 55% to between 300 and 400 billion vehicle miles under different scenarios[9];
- By 2030, rail journey demand is forecast to increase by 40%, and with unconstrained growth, rail freight has the potential to nearly double[10];
- UK air passenger numbers through UK terminals are expected to increase by an average of around 2% per year, reaching 315 million by 2030[11];
- And while a new model for forecasting port demand is under development, substantial growth is expected to continue in unitised freight, against a global backdrop of an expected doubling of seaborne trade by 2030[12].

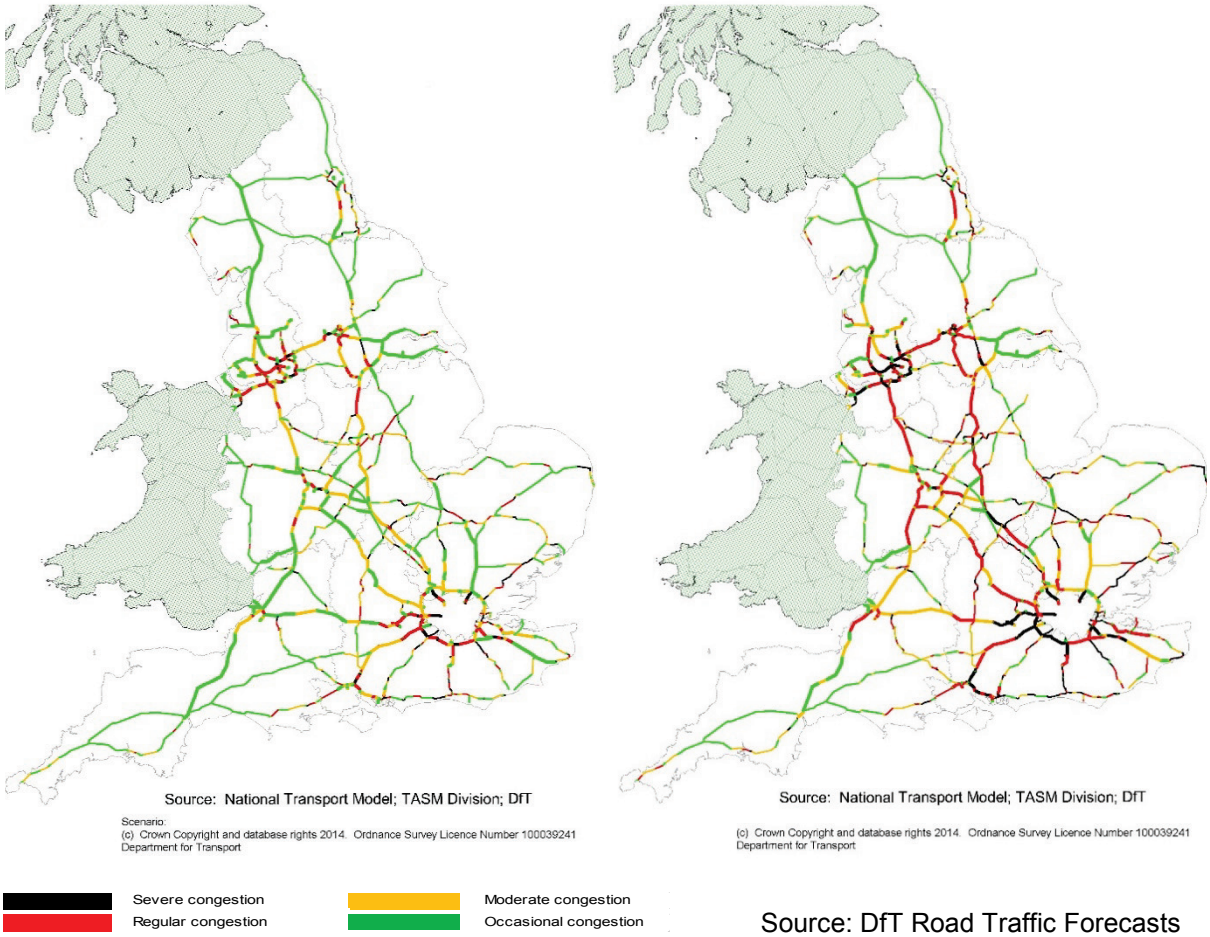
1.17 This increased demand will mean we see higher congestion on many of our most important routes, particularly those which carry people and goods into and around our major cities and serve our international gateways (fig 1.3).

1.18 The economic impacts of road congestion are far-reaching: to individuals, businesses, the environment and the wider economy. In our Road Investment Strategy, we estimate that under a high growth scenario, the year 2040 could see congestion on the SRN leading to 28 million lost working days, a £3.7 billion cost to the freight industry, and each household spending an average of 16 hours stuck in traffic a year[13]. These delays are a major concern for businesses as they reduce productivity, increase costs, and can damage reputations.

1.19 On parts of our railway, standing, station crowding and heavily loaded trains make journeys uncomfortable and can disrupt travel. We have invested in more frequent and longer trains, but these pressures are still growing.

[9] Road Traffic Forecasts 2015
[10] National Policy Statement for National Networks, December 2014
[11] UK Aviation Forecasts, January 2013
[12] Global Marine Trends 2030, Lloyds Register
[13] Road Investment Strategy: 2015-20

Fig 1.3 Congestion on the strategic road network in 2010 and 2040 (forecast)
2010 (left) vs forecast for 2040 (right)



Source: DfT Road Traffic Forecasts

The right connections in the right places

1.20 At a local level, people need to access employment centres and vital services; on a national scale, people need to travel between our cities and international gateways as part of a cohesive, well-integrated national network, especially businesses, that depend on the efficient movement of people and goods around the country.

1.21 The connectivity of our transport network is a strength. 96% of people live within an hour of a major road junction; 95% within an hour of an interchange station; and 74% within an hour of a large airport. Over 80% of the working age population live within a 45 minute commute of at least one major employment centre – delivering efficient access to job opportunities (fig 1.4 and 1.5)[14].

1.22 Despite this, there are weaknesses. Of the eleven most significant national arteries, only three run laterally. As an example, there is currently no direct dual-carriageway route between the key centres of Oxford, Cambridge, Milton Keynes and Bedford, and the main road connecting the M6 and A1 across the Pennines is still single carriageway in places. Such weaknesses don't just make journeys more difficult and frustrating, but hold back growth. And while we currently have the third largest aviation network in the world, London's airports are filling up fast and will all be full by 2040 unless we take action now, limiting the new international connections we can make.

[14] DfT Journey Time Statistics: Access to Services 2014

Fig 1.4 Major employment centres accessible by public transport
Centres with 5,000+ jobs accessible in less than 45 min

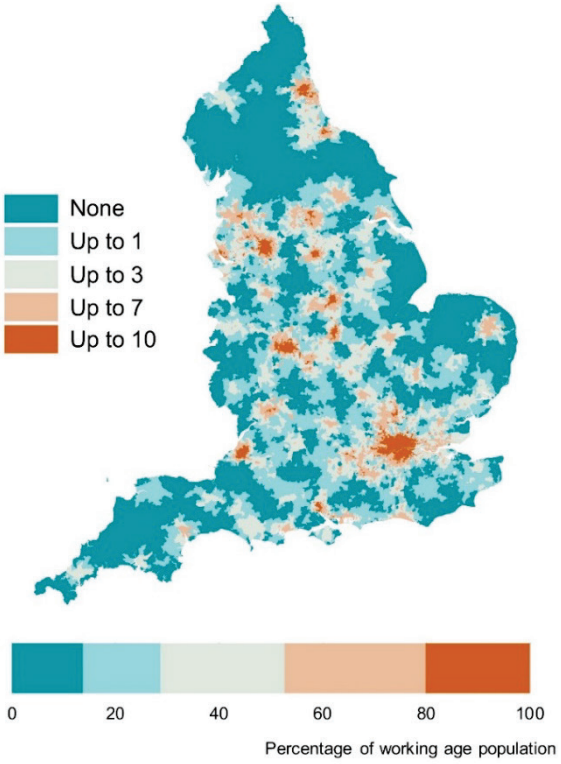
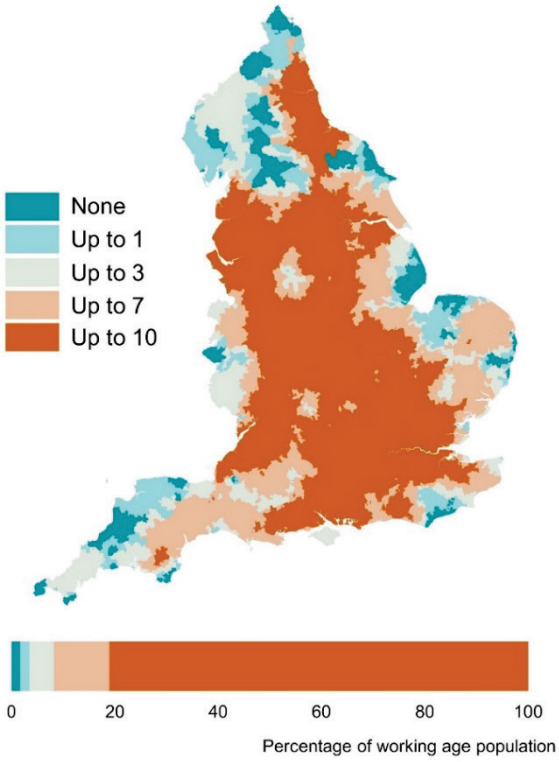


Fig 1.5 Major employment centres accessible by car
Centres with 5,000+ jobs accessible in less than 45 min



Source: DfT Journey Time Statistics 2014

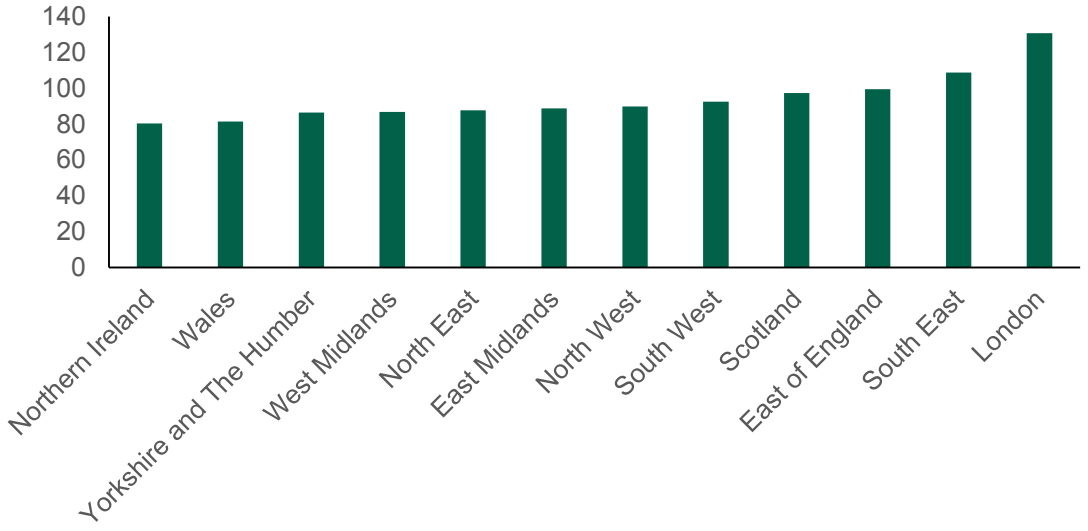
1.23 London's success as a global city has been driven in part by the effectiveness of its transport system which allows the easy flow of skills, services and products into and around the city, as well as to wider domestic and international markets. We need to apply the same thinking about connectivity across the country - assessing and addressing both the strength of connections within a region, and how that region connects to the national and international economy.

ii) If our economy is to work for everyone, we need to improve productivity and rebalance growth across the UK

1.24 Since 2010 the UK economy has grown by 14.9% and is 8.7% bigger than its pre-crisis peak[15]. The UK was the second fastest growing G7 economy in 2016, behind only Germany. Both the employment rate (74.8%) and level (31.95m) were at record highs in the three months to April 2017, and the unemployment rate was 4.6%, the joint lowest since 1975.[16] But, as set out in *Building Our Industrial Strategy*, there remain challenges to future growth overall and across regions and local areas. UK productivity has been falling behind our G7 peers. Germany's productivity is now 36 percentage points higher than our own[17].

[15] ONS, GDP Statistics, Quarterly National Accounts time series, June 2017
[16] ONS, Labour Market Statistics, June 2017
[17] ONS International Comparisons of Productivity, Final Estimates 2015

Fig 1.6 – UK GVA per hour worked across regions, 2015, indexed
GVA per hour worked index (UK = 100)



Source: Office for National Statistics

1.25 There are notable differences in productivity across regions and devolved administrations. London's Gross Value Added (GVA) per hour worked has risen to 32% above the national average, while city regions in the North and the Midlands have fallen 10-17% below[18]. As recognised in the Industrial Strategy, addressing these issues requires coordinated, sustained action across a range of policy areas including transport. That is why we are committed to transport investment playing its part in building the Northern Powerhouse and Midlands Engine, and supporting every part of Britain to reach its potential. Reducing congestion and strengthening connectivity are both crucial for increasing local productivity and creating places in which people want to live and work.

1.26 These benefits are two-fold. First, well-functioning urban networks facilitate efficient commuter access to city centres, deepening urban labour markets and increasing the economic density of the area. People and goods flow more freely, making jobs more accessible, increasing competition, facilitating knowledge flows and innovation, and reducing business costs. These agglomeration effects can have real economic benefits[19].

1.27 Connections *between* dense urban centres drive a second form of economic benefit. By bringing cities closer together, supply chains can be spread across the country at low cost, allowing areas to specialise in the production of goods and services in which they have an advantage. The North and Midlands have several such advantages, including advanced manufacturing, higher education, logistics, and professional services. Effective connections both within and between regions will allow these industries to flourish.

1.28 In combination, our aim is to harness the effects of agglomeration and specialisation to create a national network of highly productive modern city regions that can support globally competitive business clusters, with goods and labour moving freely and smoothly between them. International gateways link this system to the global economy and allow our businesses to compete on the world stage.

[18] See: HMG Building our Industrial Strategy
[19] See: DfT Wider Economic Impacts (2015); and Venables et al: Transport Investment and Economic Performance (2014)

1.29 Targeted investment can help less prosperous regions realise these benefits, unlocking economic potential and supporting a more balanced growth around the country. However, the benefits can only be sustained if investment is delivered as part of a coordinated approach, targeting a wide range of policy areas including education, skills, housing, business development and regulatory support; ensuring we better align the planning of infrastructure with local growth priorities.

iii) Our global competitiveness will help to determine our future prosperity

1.30 The Government is committed to building a truly global Britain: an outward-looking Britain that is open to business, that attracts quality investment from around the world and which builds successful trading relationships with partners old and new. In a globalised world, we must recognise that we are in competition. The ability to trade freely depends on the speed and reliability of the global connections made possible by our ports and airports. Our major cities compete with city clusters in other countries. And the quality of our infrastructure can be the difference between a company choosing to base its activity in Britain, or elsewhere.

Transport underpins effective international trade

1.31 The transport sector makes trade possible. British businesses rely on our ports and airports to provide efficient, low-cost access to markets for goods and services overseas; and on our domestic road and rail networks to organise and extend their supply chains, facilitate just in time distribution, and access international gateways. The Channel Tunnel provides a swift route to the Continent for both passengers and freight shippers.

1.32 95% of UK freight by weight moves via our ports and, measured by value, over 40% of goods traded with non-EU countries are carried by air freight[20]. Ports like Southampton, through which goods worth an estimated £40bn – including 500,000 cars – are exported every year, are investing to enhance their export handling facilities. Heathrow carries more freight by value than all the other UK airports combined, and its expansion plans will see today's freight handling capacity double.

1.33 While the private sector invests to enhance our ports and airports, Government has a key role to play, working with industry, to assess the demand for and constraints around road and rail access to ports and airports. Around a quarter of businesses cite the quality of domestic connections to international gateways as a barrier to exporting[21].

1.34 Improvements in connectivity and reliability – especially on routes connecting major industrial hubs to international gateways – can reduce costs and increase trade flows. This is crucial in a world of global supply chains, and given the export value of our world leading professional services, which rely on the reach and quality of our aviation network.

[20] HMRC Trade Statistics
[21] British Chambers of Commerce (2012); Transport Connections Support Trade

A world-class network attracts investment and jobs

1.35 The UK was the single largest destination for Foreign Direct Investment in all of Europe in 2015, at almost £1 trillion[22]. We owe this to our competitive offer which includes ease of doing business, a strong rule of law and advantages in advanced manufacturing and services. The transport system has a key role to play in attracting foreign business to the UK – both from long-established markets in Europe and the US, and from emerging economies.

1.36 Investors need effective international connections to access new markets, integrate operations into their global supply chains and to conduct business efficiently. With airports offering direct flights to over 370 international destinations, and over 100 commercial ports, the UK is well-placed to meet these needs, but we are in constant competition with other countries to attract global business. The UK's aviation hub status is already being challenged by major European and Middle Eastern airports which are using their spare capacity to attract new connections. Well-functioning networks within and across urban areas also provide access to wider markets and skilled workers. We must work to ensure we create the right environment to attract investment and with it, jobs. Good transport infrastructure also helps to encourage tourism, and enables visitors to reach all parts of the country, playing its role in a sector which generated over £62bn GVA to the UK economy in 2015.

iv) We face an immense housing challenge

1.37 The housing market in the UK is not delivering the homes that people need. The ratio of average house prices to average earnings has more than doubled since 1998, making it harder for millions of people to afford their own home[23]. At the root of this lies a failure to build enough homes. Since the 1970s, there have been on average 160,000 new homes built each year in England[24]. This is well below the estimated 225,000 to 275,000 homes per year needed to keep up with population growth and tackle years of under-supply.

1.38 The Government's Housing White Paper set out a range of proposals to boost housing supply and create a more efficient housing market. Specific actions include supporting the creation of ten new garden towns and cities, and 14 new garden villages, which will deliver over 200,000 new homes. We also need to plan for the right homes in the right places, making sure every part of the country has an up to date, sufficiently ambitious plan so that local communities decide where development should go. And we are making the planning system more open and accessible, tackling unnecessary delays.

1.39 The Government is committed to working with local areas to understand the challenges they face and identify the range of interventions that can help an area meet those needs and make the most of their opportunities for growth. In places, transport investment can play a key role in helping unlock a housing development. As residential areas expand and new areas develop, we need to ensure there is enough capacity to accommodate demand, that existing residents are well catered for, and that new residents are easily connected to centres of employment and services. Joined-up planning for housing and infrastructure is critical, and the new £2.3 billion Housing Infrastructure Fund will help to unlock development sites,

[22] ONS Foreign Direct Investment Involving UK Companies (December 2016) and EY UK Attractiveness Survey 2016
[23] DCLG Live Table 577
[24] DCLG Live Table 104

particularly where the cost of infrastructure is prohibiting development, or where large areas of land require extensive upfront infrastructure investment.

Summary and conclusion

1.40 Our transport network is highly developed, and forms a valuable national asset that, if well managed, can play a central role in responding to the challenges we face. Fully exploiting these benefits requires that we invest to maintain, enhance, and expand our network.

1.41 We must maintain sight of the wider national context, mobilising the network and our investments to tackle some of the most significant challenges facing the country. By bringing our businesses, industries, and population closer together, we can help to drive productivity growth, and do so in a way that ensures the benefits are shared by all. We can drive export growth and draw in overseas investment. And we can help to ease the pressure on Britain's housing market, supporting new developments.

1.42 Wherever we invest, or support the investment of others in our transport infrastructure, it should be in pursuit of a network that is better able to meet these challenges, and in so doing, to deliver a strong, resilient and fair economy. In this document, we set out what this will mean in practice for our investment priorities, and the way we make decisions.

2. The need for a transport investment strategy

Set against our ambitions are constraints and factors that require us to make difficult choices about how and where we invest: Our ability to fund and deliver; our need to safeguard our health and environment; and our need to adapt to change and manage uncertainty. This chapter explains the context of these challenges. Chapter 5 sets out the actions we are taking to address them, including through our Industrial Strategy.

We need to live within our means

2.1 In recent years, the Government has committed record funding to transport investment. Between 2015/16 and 2020/21, we plan to spend over £61bn on transport investment, with an additional £2.6bn from the National Productivity Investment Fund to support transport infrastructure and future transport technology. This will come alongside considerable investment by the private sector operators of our ports and airports. This investment will lead to major improvements to the network. Alongside maintenance, renewal, and upgrade works, it includes substantial investment in transformational schemes, helping address some of network's most significant strategic transport challenges.

2.2 The scale of increased spend reflects the strong evidence that transport investment can deliver significant returns, where every £1 spent can lead to benefits many times that amount. But transport infrastructure comes at considerable cost, and must take place alongside other Government priorities. We cannot afford to tackle every problem, or seek to realise every potential, through investment. Our ambitions must be balanced against the need to maintain fiscal credibility.

2.3 The aim to balance the budget by the middle of the next decade underlines that we need to live within our means. In this context, it is right to consider how we will keep future transport investments within budget; how we can find alternative and innovative sources of funding; and how we make sure we choose the best schemes which will have the greatest impact for transport users across the country.

We need to deliver consistently and effectively

2.4 Infrastructure projects are expensive, complex and have widely felt impacts. The delivery challenge is considerable, and requires navigation through the planning process and the mobilisation of a complex supply chain that can deliver on time and to budget. In most cases, infrastructure projects take place on a live network, on which people are reliant in order to carry out daily life.

2.5 **We must avoid overstretching our supply chains**. The UK infrastructure construction market alone is estimated to provide 480,000 jobs, with about 148,000 in rail, and 94,000 in road, including highly skilled civil engineers, architects, and construction experts[25]. As we set out in *Building our Industrial Strategy*, the supply chain is vital to delivering the transport infrastructure the UK needs. A 2011 report found skills, policy certainty, procurement and innovation as key challenges in the infrastructure sector[26]. To help, we have already increased long-term stability through the National Infrastructure and Construction Pipeline and longer-term funding commitments for roads and rail. Procurement and skills are key enablers of our Industrial Strategy.

2.6 **Construction costs present challenges to delivery**. There is evidence that large infrastructure projects are susceptible to cost over-run. In addition, there are characteristics of the construction sector that create cost pressures. Both domestic and global supply and demand affect the availability and cost of skilled workers and prices of construction materials. This can make construction costs more volatile. There are ways to mitigate such risks through improved cost estimation, contracts or changes to project design, but the uncertainty or long-run cost pressures can affect our ability to deliver.

2.7 **In the majority of cases, transport investments take place on a live network**. This can cause disruption to people's journeys and be a source of frustration and stress. These impacts are particularly acute where disruptions are longer and have cross-modal effects, or where there are severe cumulative impacts of different interventions. Effective planning, efficient delivery and communication can alleviate some of these risks, but they remain important considerations that affect where and when we should invest.

2.8 **We need to deliver within our legislative and planning constraints**. Transport investments can have widely felt and lasting impacts, and must consider the full range of options, design and impacts, to navigate the planning process – to ensure they balance the needs of the wider community with the impact on local people. In the case of larger schemes, on the scale of HS2 and Crossrail, construction can require new legal powers affecting public and private interests. Significant Parliamentary time can be required to take such schemes forward, placing limits on the number of schemes at this scale that can be taken forward concurrently. Future schemes may be able to take advantage of the reformed planning system, which offers a more streamlined route with use of Development Consent Orders.

We need to safeguard our environment and wellbeing

2.9 We need to manage wider impacts from the transport network and also harness the opportunities that come with doing so. Protecting our environment and health will continue to involve considerable effort and resource and may in places constrain the choices we make. Delivering that protection will be made easier with new technology. In backing the use and development of such technology we have an opportunity not only to safeguard our environment and health, but to open up new markets around the world. More widely, there is a clear an opportunity to improve the environment in ways which complement economic growth. Protecting and enhancing our natural capital will be the foundation of the Government's future

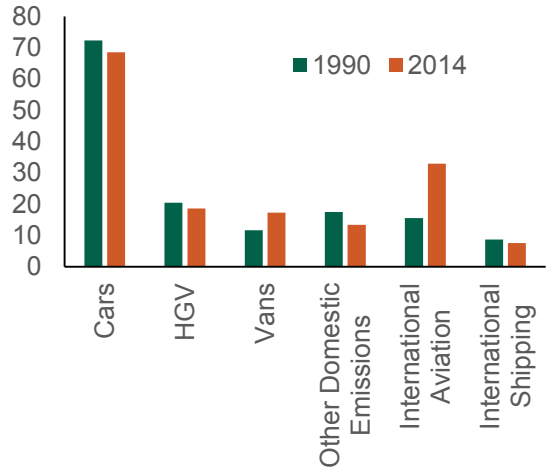
[25] Nicholls (2016), Infrastructure Market Consultation
[26] BIS (2011), Infrastructure Supply Chains: Barriers and Opportunities

25-year environment plan, as we seek to be the first generation to leave the environment in a better condition than we inherited it.

2.10 **Tackling climate change proactively**. The need to combat climate change is one of the most significant global challenges of our time. The Climate Change Act 2008 established a legally binding target to reduce the UK's greenhouse gas emissions by at least 80% below 1990 levels by 2050. The UK is committed to meeting its 2050 target and the five-year caps on emissions to 2032 set under the Act – its "carbon targets".

Fig 2.1 UK transport greenhouse gas emissions by mode, 1990 to 2014

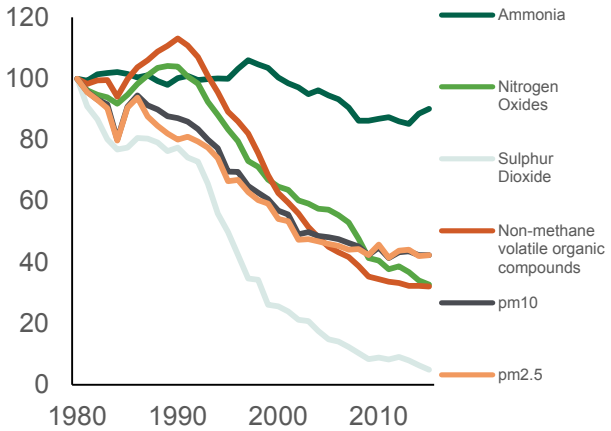
Million tonnes of CO2 equivalent by mode; 1990 to 2014



Source: Transport Statistics Great Britain, 2016

Fig 2.2 UK air pollution emissions from transport, 1980 to 2015

Index of pollutants; 1980 = 100



Source: Defra Air Pollution Statistics, 2016

2.11 We have made progress towards our long term climate change goals – in 2015, UK greenhouse gas emissions had fallen by 38% on 1990 levels – and transport has an increasingly important role to play in fully achieving them. Transport accounts for almost a quarter of domestic emissions, and while important strides have been taken in moving to more efficient vehicles, that success has been largely offset by increases in road traffic overall. Transport emissions have fallen by only 1.5% since 1990[27].

2.12 A key part of our strategy for reducing emissions from road transport is our commitment to almost all cars and vans in the UK being zero-emission by 2050. Tackling road freight emissions will remain a particular priority given the lack of a clear technological solution at present. Government will publish a Clean Growth Plan, which will set out the steps being taken to keep the UK on track to meeting the fourth and fifth carbon budgets. This will include our proposals to decarbonise transport over this period. The transport investment decisions we take will need to align with those priorities and support the transition to ultra low emission vehicles.

2.13 **Building resilience to climate change**. As well as tackling the causes of climate change, we need to adapt to the changes we are already seeing. As we recognise in the UK Climate Change Risk Assessment 2017, the trend towards warmer winters and hotter summers, rising sea levels and changing rainfall patterns will have implications for the resilience of our infrastructure.

[27] Source: Government response to the CCC report

2.14 In spite of our ongoing commitment to maintenance and renewal, the experience of recent years has demonstrated the serious disruption that extreme weather events can cause to the transport system. During the winter storms of 2014 the South West was cut off from the rail network by the collapse of the railway at Dawlish. Roads and bridges have been closed for months as a result of flood damage. We are implementing the recommendations of the 2014 Transport Resilience Review and embedding physical resilience into our investments, but as our infrastructure ages and our climate changes, addressing these vulnerabilities will be a continual requirement – a point further recognised in the 2016 National Flood Resilience Review.

2.15 **Improving air quality**. Air pollution and its impacts on quality of life are a cost to society. While emission levels of key air pollutants have improved significantly in recent decades – with most pollutants having more than halved since 1990 – nitrogen oxides (NOx) and particulate matter emissions from road transport remain a major contributory factor in local air pollution (fig 2.2) and a number of locations across the UK are currently in breach of nitrogen dioxide concentration limits. The Government is committed to taking action against poor air quality in urban areas and will publish a revised UK Air Quality Plan for tackling nitrogen dioxide in July 2017.

2.16 Part of the answer lies in measures to make the vehicle fleet more sustainable and to incentivise cleaner options. But it is vital that future infrastructure investment decisions properly account for the air quality implications too. This will allow us to make informed trade-offs, and to ensure that schemes that improve air quality are given appropriate attention. We must also seize opportunities from new technologies and falling costs of alternative fuels, including biofuels, battery technology, hydrogen storage for fuel cells, and other ultra low emission vehicles that can all help to improve our air quality.

2.17 **Managing wider impacts on our environment**. Transport infrastructure and its use brings a range of other environmental impacts that need to be minimised and managed. For example it creates noise, which can affect communities nearby. A range of mitigations can be taken to address the noise impacts of schemes, which are important if we are to create the transport network we need while protecting people's quality of life.

2.18 Similarly, physical infrastructure can cause visual blight or affect sites which contain important habitats or cultural heritage and other sensitive and historic features. These may prevent some investments going ahead, or require substantial mitigation measures, which add to the delivery challenges.

2.19 **Keeping people safe**. The safety of those travelling and working on the network is paramount across all modes of transport. Inherent safety and controlled environments around rail, aviation and maritime mean that, in relative terms, road travel presents the greatest risk. While UK roads are among the world's safest, we must invest both in routine maintenance and in technologies or upgrades that maintain and improve the safety record of our networks.

2.20 **Unlocking opportunities provided by new technology**. While meeting environmental and safety obligations will place essential calls on our resources and in some cases act as a constraint on our ambition, they also present a huge opportunity. In Chapter 5 we set out how we are responding to these factors, including with investment in innovation, research and technology that puts the UK at the cutting edge of developing ultra low emission, connected and autonomous technologies that have global commercial reach.

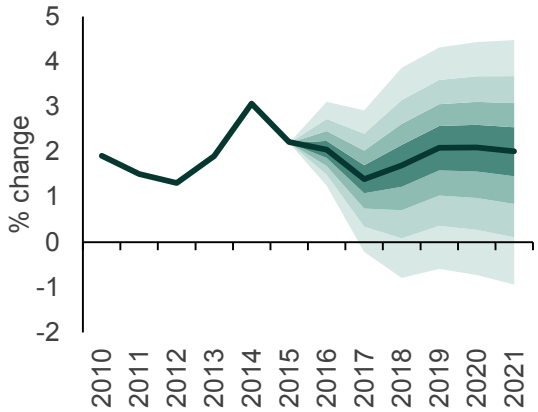
We need to adapt to uncertainty and the rapid pace of change

2.21 We live in a world of uncertainty and change that affects the way we use the transport network. We need to understand these trends to ensure the transport network can adapt. Many factors affect the supply and demand for transport infrastructure, although the exact mix varies across modes, regions and journey types. The NIC has identified four key drivers that influence the infrastructure system: the economy and productivity; population and demography; environment and climate; and technology.

2.22 **Economy:** UK GDP and income growth are important determinants of travel demand, while trade growth matters for international and domestic freight flows[28]. The UK outlook also matters for transport infrastructure supply, as it affects inflation, exchange rates, construction costs, public finances, private investment demand and interest rates. UK real GDP is forecast to grow at 2% in 2017 and 1.6% in 2018, but there is uncertainty around longer-term forecasts[29].

Fig 2.3 – OBR Real GDP growth forecasts

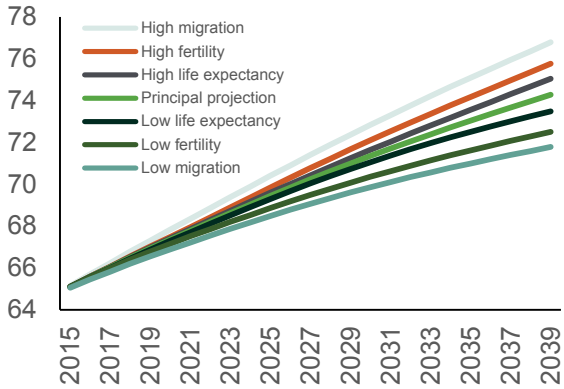
% change on previous year and confidence ranges



Source: Office for Budget Responsibility

Fig 2.4 – ONS UK Population projections 2010 to 2039

Millions, under different scenarios



Source: Office for National Statistics

2.23 **Population:** The UK population is expected to grow from around 65 million in 2015 to over 74 million by 2039, but with a range of projections dependent on net migration, fertility and life expectancy rates[30]. Demographic and social changes are also affecting demands on the network. For example the ageing population is raising demand for mobility services[31]. Faster population growth in major cities compared to smaller cities and rural areas is affecting commuting patterns[32]. Younger people are less likely to apply for driving licences and turning more to public transport or options that do not require car ownership[33].

2.24 **Environment and climate change:** Under many scenarios climate change could have wide-reaching implications, increasing the frequency of climate-related extreme weather events and disruption on our networks. With global energy demand set to double by 2030 in the absence of policy changes[34], pressure for

[28] See DfT WebTAG guidance, and NIC Economy and Infrastructure paper
[29] OBR Economic and Fiscal Outlook, March 2017
[30] ONS Population Projections to 2050
[31] ONS Overview of the UK population: February 2016
[32] NIC Population and Infrastructure, and ONS population data
[33] National Travel Survey: 2015 Report
[34] International Energy Agency

global commitments to reduce emissions is likely to grow, and the transport sector must contribute to these efforts.

2.25 **Technology:** This is likely to remain one of the most significant drivers of global growth, but it can also have disruptive impacts to existing economic and social structures. The Government Office for Science's annual report into innovation futures highlights a number of emerging technologies, including autonomous systems, big data, advanced materials and energy storage that could re-shape the future transport system[35]. These are at different stages of development, and there is uncertainty around the extent to which they will be implemented. But they bring implications for production, consumption, population, mobility and behavioural trends.

2.26 Fully automated cars are being tested on UK roads, and cars offering assisted driving are becoming the norm. Companies like Uber have shown how data can transform markets. Having access to richer travel information gives users greater control and choice. Automation could reshape the movements of people and freight and offer the prospect of ''mobility as a service', changing the way users interact with the network. We must harness the potential for these to improve our network.

Summary and conclusion

2.27 The challenges and opportunities presented by funding and delivery pressures, environmental factors and the rapid pace of change require us to not only to take realistic, pragmatic decisions but to respond with innovation, both to overcome the constraints and fully exploit the opportunities.

2.28 In the final chapter of this document, we set out how we are embracing the opportunities presented by new technologies and positioning the UK as a world leader in transport technology; extending our financial reach by exploring alternative sources of funding, private finance models, and cost efficiencies; and overcoming delivery constraints through the use of innovative delivery models and concerted action to support the UK supply chain and skills base.

2.29 All of these innovations can support our Industrial Strategy, building on Britain's strategic strengths, tackling our underlying weaknesses and creating the conditions where successful businesses can emerge and grow. Properly harnessed, they can help us meet our aim to improve living standards and economic growth by increasing productivity and driving growth across the whole country.

[35] Government Office for Science, Technology and Innovation Futures 2017

3. Our strategic priorities and propositions

Our investment decisions should focus on our main objectives

3.1 As we look ahead to future investment decisions, meeting the challenges set out in Chapter 1 will be at the heart of our work. Through our investment we can and must seek to:

- **create a more reliable, less congested, and better connected transport network that works for the users who rely on it**
  Our intensively used networks are ageing and face increasing demands, creating delays and undermining reliability. In places they don't provide the connections people and businesses need.
- **build a stronger, more balanced economy by enhancing productivity and responding to local growth priorities**
  Our national productivity lags behind other countries and prosperity hasn't been shared evenly between different places, leaving some communities feeling left behind.
- **enhance our global competitiveness by making Britain a more attractive place to trade and invest**
  Our long term success in a globalised world will depend on our ability to attract job-creating investment in our industrial strengths and to trade as frictionlessly as possible with partners old and new.
- **support the creation of new housing**
  We face an immense challenge to provide the houses that people need in the places they need them. Transport infrastructure is one of the keys to unlocking development.

3.2 In doing so we must take account of the various factors that influence the way in which we respond. We need to live within our financial means and ensure that we can deliver consistently and effectively. We need to safeguard our environment and health and prove adaptable in the face of uncertainty and change. And in response to both we need to seize the opportunities that are presented to us.

3.3 The right place for decisions to be made on specific investment projects and priorities is through the existing frameworks that are increasingly well established: at the level of our national networks through the Rail and Roads Investment Strategies; at the local and regional level through devolution arrangements that put power in the hands of local and regional communities, backed by funding; and in specific decisions on transformational national projects, like those we have already taken on HS2 and in the consultation we have held on a draft Airports National Policy Statement. They are also decisions that should be informed by the findings and assessment of the National Infrastructure Commission.

3.4 Later in this document we go on to set out how these decision-making frameworks fit together and how, through them, we can achieve a cohesive and effective transport system that maximises its contribution as a major national asset.

3.5 But to inform that decision-making, we are in a position now to identify the broad strategic priorities for investment and a number of important propositions that should guide that decision-making, both where Government will make that investment directly, and where it will take the decisions that unlock investment from other sources.

Meeting the challenges requires us to prioritise different types of investment

3.6 In order to mobilise the transport network effectively to meet these challenges, we will need to invest in the asset in different ways. Most fundamentally, we need to improve the core capability of the network, by investing to improve its condition, capacity and connectivity.

Improving the condition and performance of the existing network

3.7 Effective stewardship of the network requires us to maintain and renew our assets to keep them working safely and effectively, and to improve reliability and performance for the travelling public. This can prolong the life of our assets and control future costs. More importantly it gets to the heart of what users want. User surveys tells us that journey reliability and quality are key priorities. They want to trust the network to get them where they want to go reliably and efficiently. While maintenance and renewal spending can often go unseen, its importance is brought into sharp relief when the system fails. On intensively used networks, the impacts of system failure are compounded by the absence of viable alternatives and longer recovery times.

3.8 The challenge is considerable. Our ageing infrastructure – which in some cases dates back to the Victorian age – is subject to intensive use and increasingly exposed to extreme weather. Network Rail maintain 18,200km of embankments and cuttings[36], some of which are over 150 years old and not built to modern standards. During the severe winter of 2013/14 there were 105 earthwork failures, some of which caused lines to be closed for extended periods.

3.9 Our Road Investment Strategy showed that there can be significant value for money from maintenance and renewal schemes, with an average return of £13 for every £1 spent[37]. That is why, for example, we are investing over £6bn in local road maintenance between 2015 and 2021. Where we invest in the condition of transport infrastructure, we also help support Government's wider resilience programme, including Defra's £2.5bn investment in flood defences to create a nation better protected against floods and coastal erosion.

[36] DfT Transport Resilience Review (2014)
[37] Road Investment Strategy 2015-20: Economic Analysis

A38 Merafield Bridge replacement

Merafield Road overbridge crosses the A38, between the junctions of Deep Lane and Marsh Mills. The original bridge was built in 1969 as part of the Plympton bypass and in recent years has suffered from Alkali Silica Reaction which is more commonly known as 'concrete cancer'. If left unattended, the condition of the bridge would have continued to worsen over time, eventually making it unfit for use.

Last year, Highways England spent around £6.4million to replace the old Merafield Road bridge with a new structure. The new concrete bridge is 80 metres long, 11.3 metres wide and made of 2,503 tonnes of concrete and 401 tonnes of steel, and was delivered on time and on budget. This vital renewal work will ensure the A38 and Merafield Road stays open to traffic for years to come.

Expanding existing capacity to ease congestion

3.10 In many cases we need to invest to upgrade and enhance the existing network, making it better able to cope with demand by adding capacity to reduce congestion and crowding. This not only makes journeys more comfortable and reliable, but can make possible new trips that were previously impractical due to frequent or unpredictable delays.

3.11 On the road network, congestion creates delays and bottlenecks on heavily-used routes. And because the network is congested, incidents have a much greater impact, meaning longer recovery times and lower reliability. Managing congestion needs to be environmentally sustainable, and solutions are not limited to adding extra miles of tarmac, but can also include making road layouts more efficient, or investing in the way the network is managed.

3.12 Upgrades which tackle congestion typically have high returns. Schemes in our Road Investment Strategy, which included new sections of smart motorway, junction improvements, widening and bypasses show high rates of return, with £1 spent leading to an average return of at least £4.5.

Improvements to the A1 Coalhouse to Metro Centre to relieve congestion

This scheme was supported by the Newcastle City Deal to relieve congestion caused by high volumes of traffic moving on and off the A1 at closely positioned junctions.

In 2011, average weekday traffic flows on this section were over 116,000 vehicles, more than double its design capacity. Stationary or slow traffic on the A1 and strategic links into and out of Gateshead, caused delays and unreliable journey times.

The scheme widened the A1 south of Gateshead from two to three lanes and constructed parallel link roads to take traffic from the main carriageway. Work began in August 2014 and was completed in July 2016. The scheme increased capacity, reduced congestion and improved safety. It also saw the replacement of an existing footbridge with a new bridge suitable for cyclists as well as pedestrians, which was linked to the local cycle network by the upgrade of 600 metres of footpath.

3.13 The same is true in places on the rail network and other mass-transit systems. The railway faces a huge challenge to meet the demand for travel, especially on the busiest routes into major cities. Where lines are already running at capacity the closely-packed timetable means that when there is disruption, the effects reach further and last for longer. Additional services cannot be fitted onto the network, meaning that those existing services get overcrowded. These capacity constraints can be addressed through investment in a number of ways, including through upgraded signalling to improve the capability of the network as a system and run trains closer together, lengthening trains by investing in new rolling stock and the supporting infrastructure, and remodelling track layout

Enhancing connectivity by adding new capability

3.14 The connectivity of our transport system – the ease with which places and people are linked together – is a fundamental component of the positive economic contribution it can make. In many cases, we need to invest to add new capability to the network, which transforms travel in a particular corridor or provides opportunities for the travelling public to make journeys in a new way. This may involve creating entirely new routes, investing to better integrate different parts of the network, or delivering step-changes in capacity by bolstering existing routes with stretches of new infrastructure.

3.15 These schemes can create new links between communities and workplaces to deepen local labour markets, connect housing developments to the network or provide new routes on city and commuter networks.

The new dual carriageway between the A5 and M1 is set to unlock housing and jobs

In May 2017 Highways England completed the new dual carriageway between the A5 and M1 to help relieve congestion and improve connections between local villages and communities.

The scheme was part funded by local developers and Central Bedfordshire Council. The new road also joins the new Woodside Link road that Central Bedfordshire Council are building as part of the Dunstable Town Centre Masterplan, and provides access to a new development area north of Houghton Regis.

This scheme is expected to improve road safety and bring economic benefits to the region. In particular, it is expected to unlock the development of 7,000 houses and 40 hectares of employment land, potentially providing 4,000 jobs in the Houghton Regis area.

3.16 They can also include improving access to our ports and airports, integrating the network through hubs, and making possible new and improved journeys between economic centres.

Upgrading the A5036 to improve access to the Port of Liverpool

The Port of Liverpool is one of the country's largest ports for freight and the busiest port in the North West. It makes a significant contribution to the local economy and is an important source of employment for the local community.

At present, access is via the existing A5036, which is an urban dual carriageway. This links the port with the Switch Island Interchange of the M57 and M58, which in turn link to the M62 and M6 respectively. With the opening of Liverpool2 – a new deep-water container terminal – the Port of Liverpool is set to become even busier; but growth is dependent upon freight being able to access the port. The A5036 already suffers from high levels of congestion and the opening of Liverpool2 will lead to increased freight transport.

The proposed Highways England scheme to upgrade the A5036 aims to: reduce congestion on the A5036, improve journey time reliability for drivers, improve safety along the route, improve facilities for pedestrians and cyclists; and re-connect local communities.

By supporting the expansion of the Port of Liverpool and other planned developments in this area, the scheme will meet the needs of future traffic growth, benefit the local economy, provide local jobs, and ensure continued reliable access to one of the country's strategically important international freight gateways.

3.17 They can range in scale, from small projects which might improve cycle access to a new housing development, through to a new station providing rail access to a whole community, and right up to mega-projects like Crossrail and HS2. These larger connectivity-enhancing schemes can have much more significant wider economic impacts than smaller schemes and help unlock economic benefits on a much larger scale. To unlock growth in productivity, industrial capability and employment, global competitiveness and housing we will need to continue to invest in new or transformed connections.

3.18 These three investment priorities – addressing the condition, capacity and connectivity of the network – represent the core ways we can create a more reliable, less congested and better connected network that supports growth and housing. But there are additional reasons to invest.

Improving the user experience

3.19 We can also invest to improve the user experience for people using the transport network. The satisfaction and benefits derived from a journey is not driven solely by its speed, reliability and punctuality – it is also affected by factors such as comfort and design, the ability to work and communicate while travelling or the ease with which people can access services, plan journeys and find their way around the system – including during disruption and when things go wrong. Investment in smart ticketing, wifi on trains, online services, and the attractiveness, design and retail experience around transport hubs can play a part in improving user experience, as well as the attractiveness of the UK as a place to invest and do business. By making the most of our transport hubs as desirable and practical places to visit, offering services and opportunities that those using the network need, we can also build a transport network that plays a fuller role in creating growth and opportunity.

A safer, brighter and better station for Manchester

As part of over a £1bn investment in rail across the north of England, Network Rail have transformed Manchester Victoria into a safer, brighter and better station. The new station was designed by the Manchester studio of architecture firm BDP.

One of the key features of the new station is the 8500m² roof that arcs over the station's fully refurbished concourse, linking with the original Grade II listed station buildings. The contemporary new roof is made from the same material as the Eden Project, allowing natural light into the station, creating a bright and attractive space for passengers.

New lighting, CCTV and customer information have been installed throughout the station and refurbishment of the original booking office and installation of glazed entrances lift the overall look, feel and usability of the station.

The station's new design has also preserved its Victorian and Edwardian heritage. The programme of renovations included work on the war memorials, glass dome, Soldiers' Gate, station mosaics, wall map and the familiar glass and iron canopy that runs the length of the station's façade.

Adapting the network to safeguard our environment, safety and health

3.20 While we invest to improve the network, we must invest to manage the consequences that come with the use of that network. The safety of transport users is an imperative, and through upgrading our infrastructure we can make the network safer. This might for example include changing road layouts in accident hotspots, providing safe alternatives for vulnerable road users, or removing level crossings on the railway to reduce risk.

Crossrail – Reducing waste and delivering sustainable outcomes

The £14.8 billion Crossrail project is currently Europe's largest infrastructure project. Construction began in 2009 at Canary Wharf, and the new railway, known as the Elizabeth line, will open in December 2018, with full services running from December 2019.

Sustainability was one of the key principles underpinning the design of the new line – minimising waste, maximising material qualities, reducing energy consumption and ensuring cost efficiency.

Crossrail tunnels have been designed to minimise energy usage by elevating the track on the approach to stations to aid braking and lowering the track on the exit of stations to aid acceleration. Around 98% of the 7.9 million tonnes of excavated material are being used to create Europe's largest man-made coastal nature reserve at Wallasea in Essex. This is a joint project between Crossrail Limited and the RSPB to create a natural wildlife habitat for tens of thousands of migratory birds, and combating the threats from climate change and coastal flooding. Environmental Impacts were also minimised during the construction process with total CO2 emissions savings of 11% against the baseline during this time and 84% of the construction machinery in the central section fitted with emissions controls to reduce air pollution.

Investing in Brighton's Valley Gardens to improve cycle and pedestrian networks

Coast to Capital Local Enterprise Partnership (LEP) is committed to investing £8 million of the Local Growth Fund Grant in Brighton's Valley Gardens project as one of the major schemes in the LEP area. The key aim of the Valley Gardens proposal is to simplify the existing highway network by making the journey through Valley Gardens less complicated and more accessible for users, improving cycle and pedestrian networks and improving safety and air quality in the area. The scheme will transform the existing area into an attractive, flexible and safe space with improvements to pedestrian and cycle connectivity, road safety and the public realm. The Valley Gardens proposal aims to encourage cycling and walking around this area, generating health benefits, as well as contributing to reducing emissions.

3.21 Our investment can also deliver positive outcomes for health and the environment. Providing new cycle-ways and road networks that accommodate the needs of cyclists and walkers can encourage people to shift from cars to more sustainable and healthy forms of travel, particularly for short local trips that make up the bulk of personal trips.

3.22 Similarly, grant funding to offset the upfront capital costs of ultra low emission vehicle charge points can encourage a switch to greener vehicles that improve air quality and lower emissions, whilst supporting our automotive sector. Improving the quality of road surfaces can reduce fuel consumption and emissions, and using advanced materials and construction process can improve the levels of noise experienced by nearby communities and habitats.

3.23 The government's rail freight strategy, published in September 2016, signalled our ambition to support a greater shift from road to rail. Each tonne of freight moved by rail reduces CO2 emissions by 76% compared to road so shifting more freight from road to rail has potential to make a real contribution to meeting the UK's emissions reductions targets, as well as improving safety by reducing lorry miles. That's why we've committed £235m up to 2019, on a ring-fenced fund specifically to support investment in rail freight needs and deliver greater capacity and capability creating opportunity for more freight to be transported by rail.

We need to strike an appropriate balance between these levers

3.24 These interventions are rarely mutually exclusive. Many of our committed projects involve a number of these interventions at once. HS2 not only addresses an increasingly significant capacity problem on the West Coast Mainline, but will also transform connectivity between our major cities, link the network to major airports, drive wider economic benefits, and set new standards for the passenger experience. Similarly the A14 Cambridge to Huntingdon scheme will bring relief to a notoriously congested stretch of road by adding substantial new capacity, catering for new housing-driven demand as well as the existing traffic, much of it destined for the economically critical ports of the Suffolk coast.

3.25 In practice, finding an appropriate balance in our investments will be key to our success. This balance can already be seen in our committed plans.

£14.8bn 2015/16-20/21

With **HS2** we will ultimately triple the capacity out of Euston during peak hours, and link **8 of our 10 largest cities**. Over 100 towns and cities could benefit from the additional capacity freed up on the existing network.

We are well into the CP5 **Rail Investment Strategy,** part of the £46bn programme to operate and enhance the railway between 2014-19. It has already delivered projects like the redevelopment of stations at Birmingham New Street, Reading and Manchester Victoria, as well as important capacity and electrification

£30bn enhancements & renewals 2014-19

£15.2bn 2015/16-20/21

Our first **Road Investment Strategy** includes £4.4bn on major maintenance and renewals, as well as £9.4bn on projects to tackle congestion and make journeys smoother, including the first major new route to the South West since 1977 and upgrading all of the A1 to motorway standard as far as Newcastle. We're also using the National Productivity and Investment Fund (NPIF) to tackle pinch points on the network with a dedicated £220m fund.

£6bn 2015/16-20/21

We are funding local authorities to look after their local road networks with sustained grant funding and other incentive-driven competitive schemes to drive innovation and efficiency in **Local Highways Maintenance.**

Through the **Local Growth Fund** we are supporting projects which meet the priorities of Local Enterprise Partnerships such as the Grantham Southern Relief Road and Large Local Majors.

£5.6bn 2015/16-20/21

Rail projects

We are nearing the final stages of delivery for the major projects of **Crossrail** and **Thameslink**, adding substantial new capacity and connectivity across the capital. We are considering the case for **Crossrail 2** and **Northern Powerhouse Rail.**

£4.9bn 2016-21

Our capital grant to the Mayor and **Greater London** Authority is modernising the transport network of our capital city.

Our block **grant funding to local authorities** is also helping support the upkeep and enhancement of the local transport network – now supported by an additional £1.1bn of funding announced at the Autumn Statement 2016 as part of the NPIF.

£2.39bn 2015/16-20/21

£300m 2015/16-20/21

We are investing in **cycling and walking** including over £300m of dedicated funding, supplemented by the Local Growth Fund and block grants.

We are also backing an early transition to **ultra low emission vehicles**. More than £600m of funding has been committed, with an additional £270m announced at the Autumn Statement 2016, to boost vehicle uptake, get the necessary infrastructure in place, and support UK research and development of cleaner vehicle technologies

£600m over the five years to 2020/21, with £270m added at Autumn Statement 2016

3.26 This investment sits alongside significant enhancements being made by the commercial operators of our ports and airports – projects like the transformation programme at Manchester Airport, which will invest more than £1bn to improve its facilities, with similar upgrades also underway at airports like Bristol and Edinburgh. The owners of ports like Liverpool, London Gateway and Felixstowe have invested hundreds of millions in recent years to expand and equip their facilities to handle the biggest ships.

3.27 Many of our spending plans last into the future and commit funding to completion. Our priority for these programmes and schemes is to get on and deliver them as efficiently as possible. However, future rounds of spending are still to be determined, with major programmes of investment in roads and railways into the 2020s still under development. How the right interventions are chosen is the subject of the next chapter of this document.

How and when we invest will be guided by a set of propositions

3.28 We have developed a number of core propositions to guide our future decision-making. We will continue to consider problems and needs on a case-by-case basis, but these propositions are sufficiently comprehensive as to underpin the majority of investment decisions we will take over the coming years, and to act as a guide for those who seek Government support.

Ensuring our investment consistently meets the needs of users and helps to create a balanced economy

We should ensure that all schemes considered for funding are designed to unlock a specific opportunity that targets our objectives

3.29 To maximise the value of our spending, we will be rigorous in ensuring that each project is supported by a clear and robust case for action, which contributes directly to one or more of our objectives. In practice, for example, this will mean prioritising:

- Projects that improve user experience by addressing congestion and reliability in clearly defined ways, typically through maintenance, renewals, or capacity upgrades; especially on routes into and around our urban centres.
- Projects that deliver specific, tangible benefits to our wider objectives, for example schemes that make viable specific housing developments, or unlock identified private sector investment in jobs and industrial capability.
- Enhancements that create step-changes in connectivity and capacity where that can credibly improve the productivity or integration of our industrial, manufacturing or business clusters, both at a local and national level.
- Schemes that make the greatest contribution to environmental, safety, and health commitments, or that lead to improvements in overall user experience.

Decisions should reflect a clear understanding of the distinctive needs and circumstances of different parts of the country, and allow for a joined-up response

3.30 Our investment decisions should reflect a clear understanding of local needs, and allow for a coordinated and joined up response. Such variations may for example be driven by demographic trends, the underlying strengths or weaknesses of a region's economy, the natural geography of a place, or the existing condition of the network.

3.31 We need to be properly joined-up in our decision-making and consider how all the interventions we are making add up and interact to deliver a solution that works for specific communities, and which ensures that growth and opportunity are spread to every part of the country.

3.32 Chapter 4 sets how our decision-making structures are changing to help achieve this. Through our approach to devolution we will seek to strike the right balance between securing local involvement and ownership of decisions, whilst improving the overall coherence of our networks. Sub-national Transport Bodies (STBs) will be critical, and in Chapter 4 we set out more on the role that they will play in determining regional priorities for investment, as well as our intention to explore the creation of a Major Road Network to make sure that strategically important local roads don't get left behind.

We will take account of the balance of spending between different regions and assess investments for their contribution to creating a more balanced economy

3.33 In *Building our Industrial Strategy,* we committed that as we develop and plan future rounds of infrastructure investment we will take account of the balance of spending per head between different regions. We will continue to prioritise the highest value-for-money projects while also taking account of wider strategic aims, as we seek to address productivity weaknesses across the country, and unlock the benefits of agglomeration economies.

3.34 We are also committing to develop a new 'rebalancing' assessment toolkit, for use as part of the strategic assessment of future investment programmes. Working alongside partners in Government, the Department for Transport will develop a new assessment standard that will require investment programmes to be judged on how they contribute towards creating a more balanced economy, as part of the overall assessment of their strategic case.

We will be open minded about the best way to tackle particular problems

3.35 We will ensure that decisions consider the full range of options to address problems and take a comprehensive, cross-modal overview of the issue. Our focus should be on delivering the best outcome, rather than looking automatically to the same part of the network to provide a solution, and identifying where different modal interventions can work together in a way that creates a combined impact greater than the sum of its parts, or where innovations can support transport investment.

Getting best value out of the network and our investment

Our decision-making will continue to prioritise value for money and the application of the five-part business case

3.36 We must ensure that taxpayers' money is invested wisely. The Department has an advanced set of analytical frameworks that give decision-makers an insight into the impacts of transport projects, and give us a common framework for comparing the quality and value of schemes. We will continue to prioritise value for money when determining how best to invest public funds and apply the five case business case model to ensure projects have strategic fit, value for money, are affordable and commercially deliverable, and will realise benefits.

We should always first ensure that we are getting the most out of our existing assets

3.37 Our densely populated geography means that we are already world leaders in managing congested networks. We must invest effectively in the condition and capacity of our existing network to make them as productive and efficient as possible. Maintenance and renewal schemes can prevent disruption and reduce future costs. Increasingly, technology gives us new ways to get more out of the infrastructure we have. We will always look first to see if there are sustainable ways of getting more out of the existing asset before committing to large-scale investment.

3.38 For example on the railways, new digital signalling technology can enable trains to run more closely together, increasing the number of paths available on the existing network. Our regulatory structures can be used proactively to drive greater performance from an asset – for example by putting in place effective incentives, or bringing management of the network closer together. Smart technology or traffic management systems can direct vehicles around the network more efficiently by providing real-time information, while Smart Motorways allow capacity and speed limits to be adjusted to even out heavy traffic, improving the reliability of the network more quickly and cost-effectively.

We will continue to seek contributions from those who stand to benefit, to support transport funding

3.39 Developers have long been required to contribute to upgrading transport provision and infrastructure when expansion plans place demands on the network. In addition, Crossrail – the first stage of which has recently opened – has been made possible in part by funding from by the Mayoral Community Infrastructure Levy and Section 106 planning obligations, which have raised funding from commercial developers who stand to gain from new connections that Crossrail provides. The Mayor is currently consulting on a second phase of MCIL to replace the existing scheme.

We will seek to unlock opportunities for private finance where it meets our objectives

3.40 Infrastructure can provide an attractive and stable return for private sector investors. We will seek to unlock opportunities for involving private finance where doing so can make projects more affordable, better value for money, or easier to deliver. We set out more detail in Chapter 5.

A resolute focus on delivery

We will continue to prioritise predictable funding and a stable long-term pipeline of projects

3.41 Since 2010 we have made real progress in creating longer-term, sustainable transport investment frameworks backed by funding, correcting the stop-start approach of the past which has hampered efficiency and undermined our competitiveness. These long-term plans play an important role in increasing efficiency and lowering costs and we describe how they fit together in Chapter 4.

3.42 They are supported by the National Infrastructure Plan, first published in 2010 and supplemented since by the National Infrastructure and Construction Pipeline, last refreshed in 2016. The creation of the NIC to identify the country's infrastructure needs out to 2050, backed by the Chancellor's guidance to the NIC that they should work to an assumption that the UK's gross public capital expenditure on economic infrastructure will fall within 1.0-1.2% of GDP between 2020 and 2050, is a further commitment to a stable and sustained investment plan.

We will ensure all schemes considered for funding take a pragmatic approach to delivery challenges

3.43 We will be realistic about the projects we prioritise based on analysis of delivery risks. In particular we will:

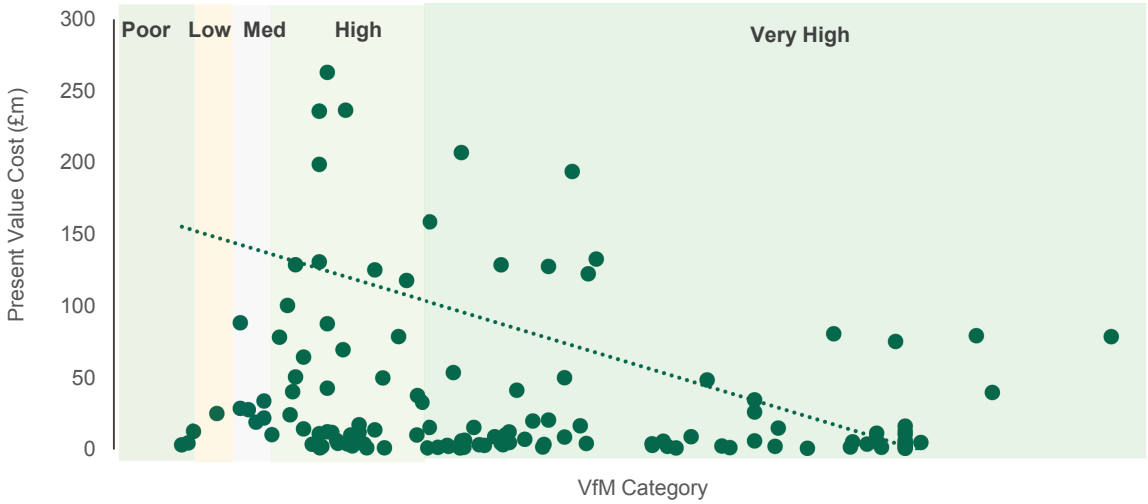
- give space for proper project development before committing to schemes.
- ensure projects take clear account of supply chain capacity and include proposals for ensuring the development of a sustainable skills base.
- ensure that schemes we fund have a viable route through the planning process.
- consider new alignments only where there is a strongly compelling case.

3.44 We will explore innovative delivery models that can improve the efficiency, speed or value for money of investment. Delivery models dedicated to the construction and design of specific projects can mean projects get built more quickly and efficiently.

Where possible, our preference should be for schemes which deliver quickly for users at lower cost and risk

3.45 We will look to prioritise smaller schemes which fix known problems in proven ways, and deliver benefits to users quickly. Such schemes are more straightforward to plan and deliver, are lower-risk, and together form a steady and reliable stream of projects, providing stability for the supply chain. Small schemes often provide very high value for money (fig 3.1) and offer flexibility in response to the uncertainty we face about how future travel trends.

Fig 3.1 Project value for money categories against cost for selected schemes, 2013-15



Source: DfT – based on sample of approved schemes

3.46 That is not to say that we will not continue to back larger projects where a compelling case is made and more modest online improvements do not offer the scale of benefits required. Sometimes transformational projects that deliver step changes in capacity and connectivity represent not just the only viable solution, but offer too significant an opportunity to ignore. So we will continue to back these projects where they generate transformational benefits which we are confident can be delivered.

Adaptability in the face of change

In response to uncertainty, we will aim for balance and diversity across our portfolio

3.47 Transport infrastructure has long lead times from decision to completion, and once built lasts for generations. We will take decisions on the best available information now, and use scenario analysis to test how durable a decision might be in response to different circumstances. But we will also respond to uncertainty by creating balance and diversity in our overall portfolio, ensuring a mix of smaller schemes that are flexible to deliver and schemes designed with built-in options that allow flexibility to change. In other cases, the best course may be to invest in schemes that offer the sorts of core functionality that are durable against changes in the way we travel.

Where appropriate, we expect projects to put the UK at the forefront of adopting future technology

3.48 We will strive to create a transport system that is innovative, built for the future, ready to embrace that change and puts the UK at the front of global technology. So whenever we are investing to improve the network condition, tackle congestion, or enhance its connectivity, we need to do so in a way that anticipates change and future-proofs the network. That means creating incentives to promote investment into ultra low emission vehicle charging infrastructure; it's why as part of the Industrial Strategy Challenge Fund we have committed £246 million over 4 years to help UK businesses seize the opportunities presented by the transition to a low carbon economy, to ensure the UK leads the world in the design, development and manufacture of batteries for the electrification of vehicles; and it means investing in research that support trials of new technologies, such as connected and autonomous vehicles, alongside ideas that identify better ways to provide information to customers and improve the management of the network.

4. Taking the decisions that will deliver better transport across the country

At its simplest, the transport network is a single entity enabling people and goods to move around the country. It consists of intricate route systems serving communities and workplaces, connected up by larger arteries moving significant flows of traffic around the country, which in turn are linked to the ports by which those people and goods can enter or leave the network: local and regional networks, connected by national corridors, linked to international gateways.

Only if all the various parts of this system work effectively and are well-integrated can its true value as a national asset be realised. As a result, we have to ensure that the necessary investment reaches all parts of the network, that it functions as a coherent whole, and that our decision-making structures allow us properly to reflect the needs and circumstances of different places in a joined-up way.

Our Industrial Strategy recognises the importance of driving growth across the whole country and creating the right institutions to bring together sectors and places to create a balanced economy that works for everyone. In this section we set out how the current system works, how it is evolving, and how it will deliver the transport network we need.

Getting devolution right

4.1 The UK's transport networks serve a huge variety of different purposes, and the way the different parts of the network are managed varies too. In England, the Strategic Road Network is managed by Highways England on behalf of the Transport Secretary with other road and local transport networks managed by local authorities. The strategic road networks of Scotland, Wales and Northern Ireland are devolved to their respective governments, with the remainder of the road network managed by local authorities. The rail network in Britain is managed by Network Rail, with the UK Government retaining responsibility for investment decisions in England and Wales. But regardless of who manages our transport networks, passengers and road users want a seamless, integrated experience on whatever mode of transport they use.

4.2 It is right that responsibilities for our networks sit at different levels: decision-making should be as close as possible to the people affected. But balanced against this is the need to ensure the coherence and integrity of national networks. Getting this balance right is essential. The right function should sit at the right level.

Devolved Administrations

Transport is substantially devolved in the UK, with differing devolution settlements in Wales, Scotland and Northern Ireland.

For obvious geographic reasons, **Northern Ireland**'s transport infrastructure, especially road and rail, is highly integrated with the Republic of Ireland, and investment decisions are taken by the Northern Ireland Executive.

Scotland and Wales also have significant devolved powers and funding, including all roads and public transport investment. **Scotland** has a separate programme of rail investments to England and Wales, although still delivered by Network Rail, and it is also responsible for letting the ScotRail and Caledonian Sleeper franchises. Transport Scotland have recently launched a Call For Evidence as part of the development of Scotland's National Transport Strategy.

Responsibility for rail infrastructure in **Wales** lies with the UK Government, although the Welsh Government has the powers to invest in rail infrastructure and passenger services. In recent years, the UK Government has a strong record in investing in infrastructure to modernise the rail network in Wales, and improve passenger experience. Major projects funded by the UK Government which have a direct benefit to Wales include modernisation of the Great Western Main Line, re-signalling between Swansea, Cardiff and Newport and on sections of the North Wales Coast Main Line, new station platforms at Cardiff Central and Queen Street stations, improvement of the Halton Curve, linking Liverpool to North Wales and part-funding for a new station at Pye Corner.

The majority of passenger services in Wales are operated under the Wales & Borders franchise. The management of the current franchise is the responsibility of the Welsh Government. The UK Government is working with the Welsh Government to facilitate their ongoing procurement process and finalise the arrangements for the devolution of the franchise.

The strategic road network in Wales is devolved to the Welsh Government. The economies of England and Wales are closely integrated. 50% of the people of Wales live within 25 miles of the English border and Wales' major arteries the M4, A55, the A5 are cross-border routes. Consequently, cross-border connectivity is an area in which cooperation between the two governments is essential to road users on both sides of the border.

In addition, all four Governments work together, especially on matters where the respective infrastructure policy responsibilities of the UK government and devolved administrations interact. For example, investment on long-distance rail lines such as the East and West Coast Mainlines, or HS2, have a big impact on journey times from London to Scotland, even if the investment itself is in England. This will improve connectivity and is key to the UK and Scottish Government's shared ambition of 3 hour rail journeys between London and Scotland's Central Belt. Wales is particularly closely integrated with England and cross border road and rail routes are a key area where collaboration between the two Governments is important. We will continue to work closely with the Devolved Administrations on air connectivity to London to improve the UK's national and international connectivity.

The Devolved Administrations receive Barnett consequentials on the Department for Transport budget in the usual way, in relation to policies which are devolved.

4.3 At the local level in England, there has been significant change over recent years with the advent of Local Enterprise Partnerships (LEPs) and devolution deals for combined authorities with elected mayors. London, meanwhile, has benefited of a mature devolution settlement with strong and accountable local leadership. By contrast, at the regional level, changes are still evolving. The previous regional architecture was largely removed in 2010, leaving space for new structures to emerge which better suited the needs of particular areas. In transport, there is scope for new Sub-national Transport Bodies to take on responsibilities and

powers to ensure that transport decisions are delivering the right results for their area.

4.4 At the national level, decisions are taken by the Secretary of State and there are clear structures in place to manage delivery of large scale, strategic investments that help keep the country moving.

4.5 We set out below a framework that guides us in determining what functions and responsibilities should sit at what level.

Principles that will guide decisions on the right level for functions and responsibilities

Proposals for the devolution of transport functions and responsibilities should be rooted in **providing better journeys for the travelling public and meeting users' needs**.

Devolution of transport powers is about **making sure decisions are made at the right level**. We need to make sure the right powers are in the right place given the nature of the organisation, its role and capability. In some cases this could mean more areas pooling together and coordinating transport functions at a higher level than they currently do.

It is crucial that measures make sense from an operational and maintenance perspective across the whole country. Gains from devolving control cannot come at the expense of **maintaining a coherent, nationwide network**. Devolution proposals must therefore show a clear awareness of key interfaces at all levels locally, regionally and nationally.

A devolution proposal must also have a suitable **geographical scope** that balances political considerations with broader economic geographies (e.g. labour markets, supply chains) and is also clearly delineated and logical in terms of the rest of the network and service geography. Where this is not possible, suitable arrangements to manage services or networks that cross boundaries (in either direction) must be included.

A key part of achieving this coherence will be securing political consensus. Proposals should help areas speak about transport with one voice and enable the leveraging of greater private sector and local funding. Proposals should also show alignment with existing bodies particularly where those bodies are responsible for wider economic development beyond transport.

All proposals should clearly aim to **improve democratic accountability** for decision making – accountability that is simple for passengers and transport users to understand.

Local and regional transport – meeting the challenges through devolution, backed by funding

4.6 Every journey uses local transport networks at some stage, and most never depart from them. These are the journeys that allow people to commute to work, find employment and get around their communities. They enable deliveries to reach their destination and businesses to connect with each other across urban areas. They are made on all types of road ranging from the small local roads to the nationally-managed strategic road network too. Indeed, the majority of journeys on the strategic road network begin and end in the same region. They are also made possible by the mass urban transport systems and suburban commuter rail services that every day allow millions of people to get into and around cities for work.

4.7 Just because these journeys are local and regional in scale, does not mean they are not of national importance. But while responsibility for individual areas is rightly devolved, we have a national stake in the success of our local and regional

transport. These are the networks that power our city economies and help communities to flourish. Investing to create better journeys around local and regional networks lies at the heart of meeting our national challenges, by:

- Deepening labour markets by allowing more people to access employment
- Cutting congestion and delays so that journeys to work are shorter and more reliable, and that the same is true for the movement of freight; and to minimise environmental and air quality risks
- Providing the necessary capacity and connections to support and unlock housing and other economic development sites
- Allowing business clusters to develop, with easy connections between organisations
- Making UK towns and cities an attractive place for inward investors to establish economic activity and jobs

Local transport

4.8 Local authorities in England have responsibility for transport and highways in their area, either at upper tier level (county councils) or as unitary authorities. They know their communities and their place best, and can deliver decision making closest to the people affected, for example on local highway investment, road safety and bus priority measures. A significant share of government funding is therefore allocated by formula, based on factors such as road length and population, through highways maintenance grants, integrated transport block (ITB) funding and a proportion of transport spending from DCLG Revenue Support Grant.

4.9 Since 2011, Local Enterprise Partnerships (LEPs) have been established across England, to enable more strategic decision making over areas often larger than single local authorities. Combining public and private sector expertise, their remit includes transport as well as other growth investments, such as skills and business development, with the aim of promoting local economic growth. LEPs' capital budgets are funded through the Local Growth Fund, a cross-Government fund incorporating a significant amount of what was previously transport major schemes funding. This is allocated competitively, encouraging innovation and rewarding success, while devolving significant responsibility for individual scheme funding decisions to the local level. To date, over 500 transport schemes have been prioritised by LEPs, many of which are in delivery or have been completed.

4.10 Building on the experience of devolution to LEPs, the Government has agreed a number of devolution deals in places where a group of local authorities have agreed to come together and form a combined authority with an elected mayor. Joining up responsibility for transport, planning and economic development over a wider area, with strong local leadership, gives the opportunity to deliver significant benefits for people locally.

4.11 This is happening in Greater Manchester, Tees Valley, Liverpool City Region, the West Midlands, Cambridge and Peterborough and the West of England, all of which elected new mayors on 4 May 2017. In return for this new governance, they will have new devolved funding for investment, and powers devolved from central government.

4.12 The exact provisions of each deal are different and reflect the needs of particular places, but transport has been at the forefront of deals in all the areas, which include:

- Commitment to a single Mayoral local transport plan across a combined authority area;
- Greater flexibility over existing funding streams, by pooling different transport grants together and providing multi-year allocations;
- Access to bus franchising powers through the Bus Services Act 2017;
- Responsibility for Key Route Networks of the most important local roads. This will put these areas more in line with London's red routes, which are managed by TfL. This will enable better integrated management of key routes in city regions, improving urban congestion, and deliver efficiencies by pooling procurement activities between the constituent local highway authorities.

London

In London, responsibility for transport and planning has been devolved to the Mayor for almost 20 years, with Transport for London now responsible for virtually every aspect of transport in the capital. The Mayor is required to produce a number of strategies, including for transport, economic development and spatial development, and he is accountable to the London Assembly for the delivery of these. This, together with sustained Government investment in London's transport infrastructure over the same period, has helped to transform London's transport networks and ensure that transport policies are properly integrated with planning, economic development and other priorities.

4.13 Putting responsibility for funding decisions as close to those affected as possible is often the right thing to do. But there will also be situations where a more strategic perspective is required, and Government plays a role in allocating funding to specific local schemes, particularly those which, due to their size, cannot be funded solely by LEPs or local authorities from existing budgets. Local schemes such as the Heysham to M6 link road in Lancashire (the Bay Gateway), which had a project cost of £134m would not be affordable through competitive Local Growth Fund allocations, so we have created the Large Local Majors programme, through which we have already approved two schemes and are providing business case development funding for 17 more. This programme has been heavily oversubscribed so far, so decisions on funding are taken by Government, based on competitive bidding processes.

4.14 Another situation in which Government will play an active role in allocating funding is where that funding supports specific national priorities. In the Budget we announced plans for a competitive process under which local authorities will be able to bid to receive funding from a £690m pot within the National Productivity Investment Fund, designed to support projects which tackle congestion or unlock specific local productivity improvements. Another example is in meeting our commitment to increase cycling and reduce cycling accidents. In the recently published Cycling and Walking Investment Strategy, we explain how additional funding has been made available for local authorities for cycling infrastructure, allocated by a competitive process. It sets out the Government's long term ambition to make cycling and walking the norm for shorter journeys, and its approach to supporting local authorities through closer collaboration.

4.15 Allocating a portion of local transport funding in this way means that we can focus resources on the schemes that make the biggest difference. But achieving that difference requires strong bids to come forward in the first place. Where evidence suggests their size or existing capability may be holding them back, we will offer targeted support to local authorities to develop their bidding and delivery capability, to ensure that all areas have the potential to produce high quality bids and to realise the benefits that strong projects will unlock. This will include making available targeted resource funding in the next financial year, to support future bidding rounds.

Regional transport: Sub-national transport bodies

4.16 The larger areas encompassed by Combined Authorities help to create better transport networks for the users that rely on them. However, we recognise there are further gains to be made by taking a strategic approach at a cross-regional level. We are committed to driving economic growth in our cities and towns outside London, but to achieve the best results we know that they cannot work in isolation. We therefore welcome the partnerships that are forming across the country where local areas are working together to develop better transport links across the region, designed to support their priorities for economic development. These regional transport links will be crucial to enabling an area to function as a more powerful single integrated economy.

4.17 For this to occur, it is important that transport planning and associated functions are carried out at the right level, in line with the principles of devolution set out above. Currently, transport planning at the national level covers England while there are 81 Local Transport Authorities and 118 Local Highway Authorities (153 including London) across the country. In addition the 39 Local Enterprise Partnerships cover a slightly larger area but even then their typical size is fairly small. Many transport schemes are larger than the boundaries of these individual areas but may still not be large enough to be of importance at a national level. There is therefore a need to increase the level of regional input and accountability in transport planning whilst maintaining a coherent, integrated national network.

4.18 We recognise that there has been a gap in transport planning at the regional level, and in response have legislated through the Cities and Local Government Act 2016 to enable the creation of Sub-national Transport Bodies (STBs). These bodies are designed to enable areas to come together and speak with one voice on strategic transport planning in order to boost economic growth and development. As local bodies they can only be created at the request of local authority groupings, approved by the Secretary of State.

4.19 A number of partnerships between local authorities have already been created with the aim of becoming STBs. These include Transport for the North which includes key cities such as Manchester, Leeds, Sheffield, Liverpool and Newcastle; Midlands Connect which covers Birmingham, Nottingham, Derby, Leicester, Coventry, Lincoln and Stoke; and England's Economic Heartland covering the Oxford-Cambridge arc.

4.20 The precise role and function of STBs will vary by region in order to reflect local and cross-regional transport and economic growth needs. However, STBs will all fulfil a similar strategic role and the Department considers they should have the following core functions, to:

- prepare a pan-regional transport strategy to support economic growth and development in the region;
- provide, based on their strategy, advice to the Secretary of State about the development and prioritisation of transport investments in their region;
- co-ordinate the carrying out of transport functions that are exercisable by its constituent authorities, such as the implementation of smart ticketing initiatives; and,
- potentially, to play a role in the investment and oversight of performance on major roads in their region (that are not part of the national network maintained by Highways England).

4.21 Where relevant there is also a role for the Devolved Administrations. An example of such cross-border cooperation is the Memorandum of Understanding between Transport for the North and the Welsh Government, which commits both parties to consult and work together to improve local transport services.

4.22 The creation of STBs will significantly change how infrastructure investment priorities are set. The implementation of STBs' functions will require bespoke mechanisms through which STBs, as Statutory Partners, will engage with the Department for Transport to ensure that their region's priorities are understood and recognised in national decision making.

4.23 This is a fundamental change, opening up central government decision making to ensure that infrastructure investment takes account of regional transport strategies and is targeted at rebalancing the country's economy. This unprecedented access to investment decision making is only possible as a result of STB's unique role as the single voice for their region and the legitimacy that statutory status gives them to prioritise potential investments based on their regional transport strategies.

Development of a Major Road Network

The 4,400 miles of the Strategic Road Network carry one third of England's road traffic on 2% of its road network by length. Local authority roads comprise the remaining 98% of the road network (184,100 miles), ranging from country lanes and residential streets to major arterial routes. The busiest 4,400 miles of the local road network carry around 16% of all traffic.

As described in paragraphs 4.24-4.32, the Government's roads reform for the national Strategic Road Network (SRN) has successfully put in place a focused, fit-for-purpose network operator in Highways England, planning and funding certainty through the Roads Investment Strategy process, and a rigorous performance regime, independently monitored. This has been accompanied by a big increase in investment in the SRN, to over £15bn in the period 2015-21.

The Government has also substantially boosted investment in the local road network, providing £6bn for maintenance alone up to 2021, up from £3.7bn a decade ago. However, no equivalent to the SRN roads reform has been applied to arrangements for any part of the local road network.

In October 2016 the Rees Jeffreys Road Fund[38] made the case that the busiest and most strategically important local authority A roads also deserve special recognition because of their importance to the economic wellbeing of regions and the country as a whole. The Government accepts the case for giving greater attention to these roads. Later this year we will consult on proposals for creating a 'Major Road Network' ('MRN'): a designated network reaching all parts of the country.

The MRN would cover our busiest and most economically important local authority A roads. This MRN would form a middle tier of roads sitting between the national SRN and the rest of the local road network. As part of this consultation we will make proposals to allocate a proportion of the National Roads Fund to the MRN.

We want the dedicated level of funding and management attention going into the Major Roads Network to strongly support delivery of economic plans and the government's Industrial Strategy at the local and regional level, delivering economic growth, supporting economic agglomeration and unlocking new housing development, alongside additional maintenance to address issues with these roads. We will therefore consult on how best to arrange the management of the MRN at the regional level, including providing a key role for sub-national transport bodies such as Transport for the North, Midlands Connect, and England's Economic Heartland in tandem with local authorities. We will also consult on arrangements for those areas where sub-national transport bodies are not formed.

We do not plan for sub-national transport bodies to become network operators or highway authorities, and in all cases, highway authority responsibility for MRN roads would remain with the existing local authorities.

National networks – meeting the challenges through financially-sustainable long term planning

4.24 Our national networks are the major arteries that allow large freight flows to move around the country, and by which our major cities and conurbations are joined up and connected, and themselves linked to the international gateways. They allow the whole country to operate as a single economic entity.

4.25 Improving journeys on our national networks between our cities and gateways can meet our national challenges by:

[38] David Quarmby and Phil Carey, 2016. 'A Major Road Network for England: A Rees Jeffreys Road Fund Study'.

- making journeys for more users, shorter and more reliable, delivering large productivity benefits for the economy
- shrinking the economic geography of the UK and enabling links between regions and cities, allowing firms to trade, specialise and develop their comparative advantage
- providing the necessary additional capacity to cater for growth in demand driven by housing and other economic development
- opening up more of the country as an attractive place for inward investment and to locate new business

4.26 Our national networks carry such significant flows of people and goods that they have understandably been the focus of Government policy and control, particularly through retention of responsibility for rail and the Strategic Road Network (SRN). The SRN carries a third of all traffic, and two thirds of all freight, on only 2% of the road network as a whole[39]. The rail network operates as a single system, carrying both long-distance 'strategic' traffic and suburban commuter traffic. In 2017 we will start building HS2, augmenting the existing network with a new high-capacity, high-speed core.

4.27 Given their strategic national importance, decisions about investment in these networks rest with the Secretary of State. The decision making structures and processes that determine the investment projects that will shape these networks have been transformed in recent years, but are now reasonably well-established and marked by the common features of long-term planning, matched by stable, multi-year funding commitments.

The national Strategic Road Network

4.28 Over the last three years, the way our strategic road network is managed and run has undergone major reform. There is now a strategic highways company – Highways England (HE) – which can operate more flexibly and efficiently; we have put in place a governance system which holds HE to account whilst giving it the freedom to operate on a day-to-day basis; and in the Office of Road and Rail there is now an independent watchdog and monitor, to represent the interests of road users, and scrutinise HE.

4.29 From 2020/21 the Government has guaranteed that all revenue raised from Vehicle Excise Duty (VED) in England will be allocated to a new National Roads Fund and invested directly back into the road network, providing stable funding that will allow us to maintain levels of investment.

4.30 Alongside these reforms, Government set out a strategic vision out to 2040, for a network that is **smoother** – with people and businesses connected safely, swiftly and seamlessly; **smarter** – leading the world in roadbuilding techniques and traffic management technology; and **sustainable** – driving the transition to a decarbonised, environmentally and locally sensitive network.

4.31 As a first step towards achieving that vision, the Government introduced a new, long-term 'Road Investment Strategy' – a stable plan for making England's motorways and major trunk roads world-class by investing over £15 billion between 2015 and 2021. It does so by tackling some of the most notorious bottlenecks on the network, like the A14 and A303, adding 1,300 miles of new lane capacity to cut congestion and smooth journeys on the most heavily trafficked

[39] DfT Table TRA4103 - Motor vehicle flow by road class and road management, as at 1st April in each year: England, annual from 1993

sections and creating a network of Expressways that provide high quality, fast dual-carriageway routes across the country.

4.32 In all, during the period 127 separate schemes are being progressed, either in development or construction. Fifty of these schemes are directly supporting housing and economic development sites. Others are directly improving access to ports and airports. For example the smart motorway schemes to the south of Manchester will improve access to our largest airport outside the south east. RIS1 also includes dedicated ring-fenced funding pots, for projects which help to unlock housing and other economic development, which tackle the environmental consequences of road use, including air quality and noise; which enable innovation; and which create better outcomes for cyclists and walkers.

4.33 While HE delivers on the commitments set out in the first RIS (RIS1), we are already starting to look ahead to the second Road Investment Strategy for the period after 2020. By starting work now, we can build a strong evidence base for future investment decisions, find the best possible designs for new projects, and secure maximum value for taxpayers from the significant capital outlay that will be made.

4.34 Last year we published the document: *'Road Investment Strategy post 2020: planning ahead'*, describing the aims and process for preparing the second RIS (RIS2). Those initial plans describe five broad aims to build upon: covering the economy, network capability, safety, integration of the network and the environment. These align with the priorities and propositions set out in this document and will be developed further in conjunction with Highways England and other stakeholders as RIS2 takes shape.

4.35 RIS2 will develop an investment programme for post 2020 that both delivers on national priorities, such as access to ports and airports to support the UK as a trading nation, and addresses long standing under investment in the SRN to tackle known transport issues. But RIS2 will also see a step change in how roads investment planning addresses rebalancing the economy.

4.36 The development of RIS2 is taking a much more structured and comprehensive approach to local consultation. For the first time it will map local and regional housing and growth ambitions across England – a process made possible by HE's direct engagement with all 39 LEPs and closer working with local planning authorities. Building a detailed picture of how the SRN can support economic growth and productivity in specific areas is a core part of HE's preparation for RIS2, and took a substantial step forward with the publication of *Road to Growth* in March 2017.[40]

4.37 RIS2 will also for the first time be shaped by the input of a regional strategic view provided by STBs, including through their contribution where relevant to the individual Route Strategies, and the Strategic Studies, that together will form a major part of the evidence base for RIS2.

[40] Road to Growth, Highways England, March 2017

Ensuring that we take joined up decisions that meet the needs of local communities

The Road Investment Strategy process allows us to take joined up decisions by facilitating close working with regional partners:

Planning: by linking the pressures on the strategic network with the needs of local communities, with a view to arriving at shared agendas and solutions. This includes through the HE Route Strategies process, during which local communities have the chance to make representations about the economic and housing priorities. The creation of STBs, like Midlands Connect and Transport for the North has placed a powerful impetus behind the identification of regional priorities.

Delivery: by co-operating to develop and fund improvements, projects can be accelerated, and designed to best reflect local needs.

Investing together on the local network: where there are clear and demonstrable benefits for users of both networks, there is an opportunity to bring investment together so that institutional boundaries do not stand in the way of better conditions for road users.

Operating together: there are potentially sizeable gains from linking together respective control centres and traffic operations arrangements, planning for winter, sharing data and coordinating road works in order to manage traffic flows better.

4.38 The development of RIS2 is divided in three broad phases: research, decision and mobilisation. The research phase is well underway and will last into next year, as we develop the evidence base that is used to inform decisions. This includes the development by Highways England of 18 route strategies covering the entire network in geographic sections, as well as the six strategic studies which are taking place to examine potential major improvements. In the case of the Oxford to Cambridge Expressway, the Northern Trans-Pennine A66/A69 corridors and the M60 Junctions 8-18 around Manchester, these have already led us to commit to taking forward major schemes in the 2016 Autumn Statement. Final decisions on the detailed shape and content of the second Road Investment Strategy will be made during 2018/19, ahead of mobilisation into 2020.

The national rail network and HS2

4.39 One of the most important challenges for the Department and industry is to build a railway network which has the capacity to deal with the ever increasing number of passengers. Investment in the rail network has been, and in many respects will continue to be, centred on how we can get more out of the existing network. There has been a steady stream of improvements to increase capacity or improve service performance, by lengthening trains and platforms, constructing flyovers and underpasses to remove bottlenecks, and adding new track. More of this will be needed, but if we want the growth to continue in the future, we have to ease some of the pressure on the busiest parts of the network.

4.40 Pressure is particularly acute on our key North-South rail corridors, with parts of the West Coast Main Line effectively full at peak times. That's why we are building HS2, a new line that will provide a step change in capacity between our largest cities. HS2 will be the world's most advanced passenger railway and transform connections, particularly between the Midlands and the North.

4.41 HS2 will be fully integrated into the network. The benefits will not be limited to those who use HS2 itself. By transferring intercity passengers to a new, high-

speed line, HS2 will reduce pressure on other key routes. This will open up opportunities for new services into as many as 100 towns and cities across the UK, freeing up regional and commuter capacity on existing lines and providing more opportunities for long-distance freight services travelling between our ports, industrial centres, and logistics hubs. For example, HS2 also has huge potential to support growth and improve connectivity into North Wales. Passengers travelling from North Wales will be able to benefit from faster journey times by interchanging with HS2 between Crewe and London.

High Speed 2 will help boost productivity and rebalance the UK economy

Demand for rail travel is growing faster than for any other mode. Over the past 20 years the number of rail passengers has more than doubled to over 1.7 billion a year, placing strains on key routes. Among the worst affected is the West Coast Mainline which, with up to 1 in 6 passengers standing during the morning rush hour, is now effectively full at peak times.

Extra capacity provided by decades of upgrades has filled up faster than expected; and with demand for services now exceeding the number of train paths available, the route is approaching its limit. These pressures do not only lead to crowded journeys for passengers. Rail congestion has a significant effect on the reliability of time-critical services: impacting commuters, businesses, and logistics companies for whom rail freight is a key part of their delivery network.

The full High Speed 2 network will link London to Birmingham, and Birmingham to Manchester and Leeds – delivering a step-change in capacity. It could triple the number of peak-time seats available out of Euston; by connecting 8 of our 10 largest cities it will directly serve 1 in 5 of the UK population.

HS2 won't just connect cities to cities, but to the rest of the world too, with fast connections to Heathrow via the Old Oak Common interchange and HS2 services calling at Birmingham International and Manchester Airport.

Services will travel at up to 220 mph, substantially cutting journey times between our major cities. For example the journey between Birmingham and Leeds will more than halved to 49 minutes, from 1hr58 today.

Once complete, transport users are expected to derive a combined £81bn of benefit. The project will also provide a significant stimulus to the economy – currently estimated at £21bn. Planning and delivery will employ 25,000 people and create as many as 2,000 apprenticeships, while an estimated £25bn of contracts represents a major opportunity for businesses across the UK. HS2 will underpin plans of local areas to grow their economies – for example, in Leeds the South Bank regeneration project is expected to create 35,000 jobs and 4,000 new homes. The resulting growth in the wider economy could create up to 100,000 additional jobs across the UK. The cost of HS2 is £55.7bn, with each pound expected to generate £2.50 in benefits.

4.42 The national rail network is already highly integrated, with different types of rail services – commuter, regional, inter-city and freight – all sharing the same infrastructure. Rail infrastructure in Scotland is devolved to the Scottish Government, while responsibility for rail infrastructure in England and Wales rests with the UK Government. Some rail routes and services have been successfully devolved to city based transport bodies. However, unlike some comparable European countries, the historical development of our national network has fostered a complex and interdependent set of rail services, and there are many routes and services where it would be challenging to develop effective devolved bodies in line with the principles set out above.

4.43 By setting the network priorities for railway investment, the Government can help ensure the railway works as an integrated system, balancing the interests of a wide range of passenger groups, rail freight shippers and our objectives for the taxpayer and wider national economy.

4.44 Priorities for investment on the national rail network are currently set by the Department, drawing on advice from the industry, and informed by the wide-ranging programme of market and route studies led by Network Rail, working with local transport bodies and the rail industry. This process sits within a regulatory framework, with the Department specifying the outputs that Network Rail is charged to deliver through infrastructure enhancements, but also the outputs expected from the franchising process. Franchise agreements, for example, are used to secure investment in network assets by requiring or encouraging the procurement of new rolling stock and, in some cases, upgrading stations.

4.45 The current planning or 'control period' ends in 2019. We will shortly set out what we want the railway to achieve during the next control period, between 2019 and 2024, with the publication of the next High Level Output Specification. We will also consult on the specific decision-making framework for the future investment plans, building on the lessons learned from delivery of the current programme and prioritising a smarter, pipeline approach that ensures schemes are developed, designed and delivered in a carefully managed process that lowers delivery risk and gives a greater voice for industry, passenger representatives and local transport bodies.

4.46 Our plans will set out how we are responding to the unique challenges of a railway in which passenger journey numbers have doubled in twenty years. Our railways need to adapt and change in order to be able to cope with growth and provide a reliable service that passengers can trust. This means making a series of changes to deliver the best possible passenger experience, including:

- Supporting Network Rail's reform programme following the Shaw Report to devolve greater authority to its regional route managers, giving them the power to respond more quickly and effectively to local needs. We are also supporting the Office for Rail and Road's plans to regulate each of Network Rail's routes individually from 2019. These changes will promote competition between Network Rail routes, and provide opportunities to recognise routes that are innovating, increasing efficiency, and above all improving the service delivered to passengers.

- Putting into practice a core finding of the McNulty Review on how to make the railways run more efficiently and cost-effectively, by bringing together the operation of track and train. It is critical that train companies and Network Rail work effectively together to deliver the standard of service that passengers

expect. For example, alliances bring the train operator and infrastructure manager closer together to deliver joint initiatives and meet shared targets, focussed squarely on the needs of passengers. In future franchises, where the local conditions are conducive, we will support the use of alliances which allow more effective planning of engineering works and a faster, more coordinated response to incidents, improving reliability.

- Giving a voice to Sub-national Transport Bodies and LEPs to inform and influence the investments we make, and ensure that they line up with the priorities of those who use and rely on the network day in, day out. As with the strategic road network, we need to retain the ability to take into account the national needs and needs of freight.

International gateways – trusting the market to deliver and connecting to the network

4.47 People and businesses need not only to get around their communities, and across the UK, but to connect with the rest of the world as well, through our international gateways. Exporters need ready access to the global marketplace, importers need reliable and efficient entry points for goods, and businesses need to be able to make straightforward links across the world with established and emerging markets. As an open, competitive, trading economy, our success is closely tied to our connections with the rest of the world, made through our airports and seaports, both at the level of major international hubs and the regional ports that feed them.

4.48 Investment in upgrading the infrastructure at and around our international gateways helps meet our national challenges by:

- allowing for sustainable growth in traffic, enabling more international connections to be made and increasing the frequency and reliability of those connections
- making international journeys quicker and more straightforward, driving productivity
- creating better conditions for international trade by making imports and exports logistically easier and more reliable
- making the UK an attractive place from which to operate global businesses, which depend on connectivity with the rest of the world

4.49 The majority of our ports and airports are owned and operated in the private sector, although some are run as commercial operations under local authority control or, in the case of some maritime ports, under the control of a trust.

4.50 Investment and expansion at these crucial facilities is therefore generally dictated by commercial considerations and driven by the functioning of a competitive market which, in the case of Heathrow and Gatwick airports, is regulated by the Civil Aviation Authority. Significant sums have been invested by the private sector in our international gateways in recent years, with projects like the £2.5bn transformation of Gatwick underway, and investments at London's major ports that surpass £2bn.

4.51 Because ports and airports often have substantial impacts over a wide geographic area decisions around their expansion will sometimes, subject to certain thresholds, constitute nationally significant infrastructure projects under the

Planning Act 2008. We have set out the framework within which decisions on future expansion of ports will be taken in the Ports National Policy Statement.

4.52 In addition, we have consulted on the draft Airports National Policy Statement. This follows the previous Government's announcement in October 2016 that its preferred scheme for meeting the need for additional airport capacity in the south-east of England is a new north-west runway at Heathrow Airport. This scheme was the unanimous recommendation made by the independent Airports Commission in July 2015.

4.53 The draft Airports National Policy Statement sets out the need for additional airport capacity in the south-east of England, why Government believes that need is best met by a north-west runway at Heathrow Airport, and the specific requirements that the applicant for a new north-west runway will need to meet to gain development consent.

4.54 The biggest consequences for Government investment often come in the form of surface access: ensuring that ports and airports are connected up to the existing national networks and that those networks have sufficient capacity to handle the traffic moving through those gateways.

4.55 The existing Road and Rail Investment Strategies contain a number of projects designed to improve surface access to ports; for example the A63 Castle St widening project in Hull and the A14 Cambridge to Huntingdon bypass both will improve road access to important east coast ports. On the railways, the recently completed Reading area redevelopment created space for an additional six freight trains a day on the critical freight route between Southampton and the country's logistics heart in the Midlands.

4.56 Future investment rounds will need to build on this, and be informed by the development plans of gateways themselves, and the priorities of the regional bodies who best understand their regional networks. That process will also be informed by two substantial pieces of work.

4.57 The Port Connectivity Study will involve a detailed review of port connectivity issues across England, which are crucial to trade. It will assess the potential need for new capacity or connectivity taking into account planned investment, with a view to identifying the priority areas where intervention may be needed, and is intended to be complete later this year.

4.58 For aviation, the Government's current policy is set out in the Aviation Policy Framework (APF) 2013. The APF sets out the sector's objectives and policies and its role in driving growth, creating jobs and facilitating trade, while addressing a range of environmental impacts. The Government is developing a new Aviation Strategy that will set out the Government's vision for the wider aviation sector, including surface access. This will replace the 2013 APF and will be subject to a separate consultation process.

The National Infrastructure Commission

4.59 The decisions we take about where and when to invest in the future will also be informed by the findings of the National Infrastructure Commission (NIC), which is charged with providing impartial, expert advice on the long term needs and provision of economic infrastructure. Since its establishment in 2015, the NIC has published a series of reports on specific issues such as the Oxford-Milton Keynes-

Cambridge growth corridor and Northern transport connectivity. The findings of these are already helping to shape near term investment decisions.

4.60 Alongside this series of studies into specific infrastructure challenges, the NIC will produce a National Infrastructure Assessment (NIA) once every Parliament, with the first full NIA due for completion in 2018. The NIA will set out the Commission's assessment of the long-term infrastructure needs across the economic infrastructure sectors and the recommendations made will help to inform decisions about the shape of subsequent investment programmes.

Getting to the right decisions through appraisal and evaluation

Understanding and valuing the impacts of transport investment

4.61 Each part of the network is unique and schemes must be judged on their own merits. We use the Five Case Model for transport business cases[41]. This ensures projects set out a compelling case on their strategic fit, economic value for money, financial affordability, commercial achievability and management of benefits. This allows comprehensive and comparable assessment which helps us prioritise our resources. It ensures a wide range of options are considered and assessed proportionately at different stages of project development.

4.62 The strategic case aims to demonstrate how schemes are supported by a robust case for change that fits with wider public policy objectives. By setting out a clear set of priorities for transport investment, which are fully aligned with the Government's wider aims around boosting productivity, unlocking housing and rebalancing the economy, we can ensure that our future transport investment schemes clearly demonstrate within the strategic case how they are meeting these aims, and strengthening our decision making processes.

4.63 In *Building our Industrial Strategy*, we committed that as we develop and plan future rounds of infrastructure investment we will take account of the balance of spending per head between different regions. We will continue to prioritise the highest value-for-money projects while also taking account of wider strategic aims, as we seek to address productivity weaknesses across the country, and unlock the benefits of agglomeration economies.

4.64 We are also committing to develop a new 'rebalancing' assessment toolkit, for use as part of the strategic assessment of future investment programmes. Working alongside partners in Government, the Department for Transport will develop a new assessment standard that will require investment programmes to be judged on how they contribute towards creating a more balanced economy, as part of the overall assessment of their strategic case.

4.65 In assessing value for money, we consider all relevant impacts using a highly-developed analytical framework. This includes the Department's appraisal guidance framework, the Transport Appraisal Guidance or WebTAG, which is based on a range of robust evidence and updated to reflect the best available evidence[42].

4.66 While this framework is considered among the most developed in the world, we are continuously looking to improve it. In recent years, we have updated the guidance to better reflect the impacts of transport infrastructure investment under

[41] See Public Sector Business Cases: Using the 5 case model
[42] https://www.gov.uk/guidance/transport-analysis-guidance-webtag

the *Understanding and Valuing the Impacts of Transport Investment* (UVITI) Analytical Strategy. The latest update focussed on how we understand and appraise the wider economic impacts (WEI) of transport investment[43]. This followed the 2014 *Transport Investment and Economic Performance* report – a DfT commissioned independent review of the evidence on transport and the economy, which found that transport plays a vital role in driving economic growth, through three key channels[44]:

- User benefits: savings in the time and cost of travel;
- Productivity effects: gains to workers and firms from economies of scale and higher economic density that lead to benefits of specialisation and productivity;
- Investment and employment: areas with better transport links are more likely to attract private investment that helps develop business clusters and attract workers.

4.67 The report also highlighted the importance of understanding the extent to which the effects of transport investment are *additional* and create net benefits to the economy, or where they could lead to *displacement* of economic activity across areas.

4.68 Our proposed new guidance on economic impacts is a significant step forward for delivering on the agenda set out in this strategy as it:

- Strengthens the links between the strategic and economic case for a scheme – helping ensure that the full range of impacts are properly explored and that a robust evidence base is used to demonstrate that a scheme meets its economic objectives;
- Provides a stronger basis for capturing structural changes in the economy which result from step-changes in connectivity and capacity;
- Encourages a better understanding of how transport investment supports economic growth in the local area e.g. by ensuring that the specific characteristics of the local area and existing plans and aspirations are taken into account; and
- Updates previous guidance on reflecting the benefits of housing growth unlocked by transport schemes in the value for money assessment. We continue to work with scheme promoters to ensure that the guidance is being applied to capture those benefits in business cases.

4.69 Alongside this, we are investing to improve our transport modelling analysis so that it reflects the latest data and evidence on how often people travel and with which modes. In addition, we are enhancing our understanding of uncertainty and impacts of technology.

4.70 We will continue to prioritise value for money analysis, alongside the strategic, financial, commercial and management cases, when deciding how best to invest public funds. We will shortly publish new value for money guidance to provide a comprehensive overview of best practise value for money assessment across DfT.

4.71 We are working to review and improve our business case process and its impact on strategic decision-making and to develop capability across the Department. In particular, we are working to strengthen the focus on users through our Think

[43] DfT: understanding and Valuing the Impacts of Transport Investment
[44] Venables et al, 2014: Transport Investment and Economic Performance

People programme. We are also committed to carrying out proportionate benefits management and evaluation to ensure that we build our understanding of the benefits schemes deliver and learn lessons for future investment.

4.72 In developing new evaluation approaches, we are seeking to strengthen evaluation's links with appraisal both to ensure it builds on analysis conducted for the business case and to provide feedback for future analysis[45]. We have established a monitoring and evaluation programme of priority projects and publish annual updates on progress[46]. This includes an ambitious evaluation of Crossrail, undertaken jointly with TfL, which seeks to identify its wider economic impacts. The Department has also joined the funding group for the What Works Centre for Local Economic Growth and will use this connection to help develop our approach to evaluating local transport schemes, in collaboration with local partners[47].

Managing Uncertainty: Risk, uncertainty and scenario analysis

4.73 We use a suite of tools to identify, understand and manage risk and uncertainty and to consider the impacts and risks of investment under alternative scenarios. Our appraisal analysis requires the use of sensitivity and risk analysis at all stages of business case development. Key risks and sensitivities are required to be set out clearly in the strategic, economic, financial and management case.

4.74 The Economic Case provides a number of additional tools to understand and manage risks. All capital investment projects are required to apply evidence-based adjustments to account for the risk of cost overruns, particularly at early stages of development, in line with WebTAG and HMT Green Book guidance. In addition, all options require sensitivity analysis to test the impact of key assumptions on costs, benefits, the benefit-cost ratio and on the project's overall value for money category.

4.75 The Department uses scenario analysis as an additional tool to test the impact of the projects under alternative future states of the world. These are based on evidence and judgements about plausible future scenarios. In the RIS, we set out four scenarios for the future of road traffic demand under different assumptions. We will be further developing this approach for RIS2.

4.76 The NIC are producing scenarios to test the future outlook for infrastructure supply and demand to 2050 to inform the NIA. These will be based on analysis of the four key drivers of infrastructure supply and demand: the economy and productivity; environment and climate change; population and demography; and technology – and selected variants of these under plausible scenarios. We are working closely with the NIC on the development of these scenarios to ensure our scenario analysis is built on a consistent evidence base.

[45] DfT: Strengthening the links between appraisal and evaluation, 2016
[46] DfT Monitoring and Evaluation Programme, 2016
[47] What Works Centre for Local Economic Growth: Transport

5. How we will deliver: innovation and action

As we develop our future investment plans, we will embrace the opportunities presented by new technologies, positioning the UK as a world leader in transport technology; extend our financial reach by exploring alternative sources of funding, private finance models, and cost efficiencies; and overcome delivery constraints through the use of innovative delivery models and concerted action to support the UK supply chain and skills base. These innovations can not only improve journeys for the travelling public, but will also support our Industrial Strategy, building on Britain's strategic strengths, tackling our underlying weaknesses and creating the conditions where successful businesses can emerge and grow.

Research, Innovation and Technology

5.1 Investment in innovation and technology can help increase choice and quality for consumers, drive productivity growth, increase efficiency and enable sustainable growth. This is a core theme of our Industrial Strategy – which will deliver a major upgrade in the role of science and innovation in our economy for the years ahead. The Government has a key role to play in driving investment in innovation across the whole of the UK – through direct investment in new technology and via our innovation policy frameworks.

Exploiting new technologies

5.2 Technologies can enable improvements in how we **invest in infrastructure** – by allowing smart and efficient construction, condition monitoring, maintenance and resilience of our investments. They can help **make journeys better for the travelling public** – by allowing us to better manage demand, deliver smoother and more integrated journeys, minimise disruptions to users, and increase accessibility for users with mobility issues. By providing up to the minute information, they can **keep the traveller informed** about their end-to-end journeys and 'nudge' users towards more sustainable options. They can also deliver **more sustainable transport** – innovation will be vital to us meeting our emission reduction and air quality ambitions. And they can help **make transport safe and secure**. For example, new in-vehicle technology and vehicle/infrastructure (C-ITS) communications can deliver a step change in safety, reducing accident risks, while adoption of the UK's world-leading condition-monitoring technology on rail infrastructure and rolling stock can radically reduce unplanned track possessions for repairs and further enhance safety and comfort.

5.3 We need a transport system that is built for the future and ready to embrace change. When we are making investment decisions, we need carefully to consider future change and how we can future proof the network, which means having a clear understanding of new transport technologies, supporting their evolution where

appropriate, and scanning the horizon for emerging technologies that may become disruptors for transport in the future. This is important for the direct investments we make into the network, and also where we provide an enabling environment for investment through grants and regulation. Some of the key technologies we are working to promote and influence via our investments are highlighted below.

Technologies that improve user experience

Including **Smart Ticketing** (£80m initial funding for the North), **Wi-Fi** and **apps**

These provide people with greater information and choice. Everyone using our transport system should be able to use **mobile phones, contactless cards or smart cards** to purchase tickets; use efficient easy to use web portals to access these services; and use **barcode systems to collect or present tickets.**

Investment in ticketing and technology infrastructure can open up opportunities to implement these solutions and potentially make **interoperable payment across different transport modes and services**, seamless and convenient and encourage better uptake of public transport modes.

Uptake of Ultra Low Emission Vehicles

We have invested **£90m in chargepoint infrastructure** since 2013 plus **£80m through the NPIF,** as part of a £600m package of support in the five years to 2020/21 and £270m uplift at Autumn Statement.

Increased uptake of Ultra Low Emission Vehicles can help meet our aims to **reduce greenhouse gas emissions, improve air quality and attract inward investment.** A perceived lack of public charge points is frequently cited as a barrier to uptake.

Through financial support, and tax incentives, the government is helping to **offset the upfront cost of charging infrastructure for consumers and businesses** where there is currently limited commercial returns for investment. The Government is also investing to support cities to implement packages of policy and practical measures to encourage the take up of ultra low emission vehicles through the **Go Ultra Low Cities initiative** and is supporting innovation in new battery design and the hydrogen economy. In January we announced winners for £20m of funding into a low-emission freight and logistics trial. The government will set out its long term strategy for promoting the transition to zero emission road transport by March 2018.

Battery technology

As part of the **'Faraday Challenge'** we are investing to put the UK at the forefront of developing battery technology.

We have committed £246m over 4 years from the Industrial Strategy Challenge Fund to help UK businesses seize the opportunities presented by the transition to a low carbon economy, to ensure the UK leads the world in the design, development and manufacture of batteries for the electrification of vehicles

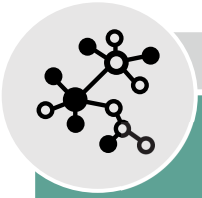
Battery technology is important to a range of new technologies, including the automotive and light rail sectors. Electric vehicles are less polluting and cheaper to run, and have the **potential to provide electricity storage and demand flexibility** that could provide benefits to consumers and our electricity system.

Connected and autonomous vehicles

Government has already committed **over £200 million** to accelerate the **research, development, demonstration, and deployment** of these technologies, to match that funded by industry. The National Productivity Innovation Fund commits £100m for new UK CAV testing infrastructure

Seen as the future of travel, these technologies can deliver significant benefits to the travelling public and to the network as a whole, by **making journeys safer, increasing capacity, improving traffic flow and journey reliability, and reducing emissions.**

There is also potential for **"platooning" of freight vehicles** to deliver substantial improvements for freight users, businesses and ultimately consumers. We are committed to investing in the future of these solutions, and developing the best regulatory environment to **encourage further investment** and take-up of these solutions and the support for growing our national expertise in Robotic and Autonomous Systems.



Smart systems and digital solutions

We have been trialling and deploying **smart motorways, digital signalling on rail**, supporting progress towards smart cities

Smart systems and digital solutions that use data science techniques for the analysis of a diverse range of big data sets and other digital solutions can help us **better understand, join up and manage our transport systems**. Smart traffic management technology can reduce congestion in urban areas, using the information from millions of smart phones about people's location and speed **to make journey's better.**

Smart motorways are already being rolled out to increase capacity and safety, and reduce congestion on key parts of our key strategic road network. With £450m funding from the National Productivity Investment Fund, digital signalling is being trialled on our rail network aiming to improve reliability, and expand the capacity of the network.

Advanced materials and condition monitoring

Improving the **quality, resilience and sustainability** of our transport infrastructure.

There are significant developments in material technologies that allow transport to be **smarter and more resilient,** so that infrastructure has the capacity to **condition monitor** and detect any faults before they become critical.

In addition to this, new manufacturing techniques in construction allow for **more efficient development of the built environment** with higher levels of precision and speed. These are critical in our aims to build **green and resilient** infrastructure.

5.4 In addition, investment in wider research is important for government, working closely with academia and the private sector. Such investment can help us better understand the evidence and deliver innovative solutions for problems we face today and in the future. We have previously commissioned analysis on the impacts of Connected and Autonomous Vehicles and, having announced the Government Office of Science's next Foresight Project will be on the Future of Mobility, we look forward to receiving the results. We will draw on such cutting edge research to develop improvements to the transport system and understand what impact new technologies, or changes in business models and demographics, may have on how transport is offered, delivered and operated in the future.

5.5 Such innovation can often serve multiple purposes – encouraging efficiency, driving up quality and safety, protecting the environment, and improving the experience for users. They can provide significant benefits to users and to the wider economy. But we must be alive to the risks too – there can sometimes be significant disruption associated with innovation that have to be managed; and there are concerns from consumers about data protection and security given the rise of big data, apps and autonomous systems. Given the uncertainty, we have commissioned a set of plausible technology scenarios, to understand potential futures and the implications for our roads

5.6 Looking ahead we will prioritise investments in technology and innovation, to help make the UK's transport system the best in the world, and to provide users with the most advanced transport system possible. We will look to future-proof investments, with incremental steps where we know technologies are more developed and further research on the impact of more disruptive technologies and their implications for our investment, using scenario analysis. We will also seek to strengthen UK supply chains through strategic procurement, maximising the broader benefit to the UK economy as well as enhancing the experience of the traveling public.

Positioning the UK as a world leader

5.7 Excellence in science, research and innovation is recognised by our international competitors as an important source of future competitive advantage. The UK is well placed given our strong science base and levels of research & development. Investing in innovation and technology will help position the UK as a global leader in transport technology. We are establishing UK Test Beds to test and demonstrate our capabilities, and to attract international participation and investment in these technologies as part of our Industrial Strategy. Through strategic procurement we will seek to strengthen UK supply chains, including export potential, to maximise the benefits to the broader economy of these public investments, leaving an enduring legacy of excellence; one such opportunity being the Digital Railway. Where we do invest we will have Intellectual Property (IP) strategies in place that ensure the appropriate allocation of IP between Government and industry.

5.8 Our work on Connected and Autonomous Vehicles offers a useful example of the UK's Industrial Strategy at work. Exhibiting the best of our world class science, research, and innovation ecosystem, these technologies are in the vanguard of disruptive new business models across sectors – encompassing UK excellence in automotive innovation (including ultra low emission technologies), software, communications, infrastructure, and business services such as insurance, law, and finance, among others. They also embody a strong regional story, fusing the Midlands Engine with London but increasing pockets of expertise across the country. In essence, Connected and Autonomous Vehicle technologies suggest one way that can secure the UK's sustainable, long-term economic growth with high quality jobs

and a competitive global trade and investment offer as well as maintaining strong international influence.

5.9 Government has created the Industrial Strategy Challenge Fund to help Britain capitalise on its strengths in research and innovation. This new funding will back technologies at all stages where the UK has the potential to take an industrial lead, from early research to commercialisation. It will support collaborations between business and researchers to focus on challenges and opportunities that have the potential to transform existing industries and create entirely new ones – including future transport infrastructure such as world-class battery technology so the UK can fully exploit the industrial opportunity of ultra low emission vehicles in a number of transport mediums.

5.10 There are a number of other areas where our investments are delivering world beating technologies, and that we can export or use to attract foreign investment – boosting jobs and growth in the UK. Our green transport technologies can provide innovative solutions to numerous countries in their aims to boost growth and meet climate change commitments. Our smart city and traffic management systems can be sold globally, particularly to countries in the advanced and emerging economies that are seeing rapid urbanisation and rising congestion, and that need better solutions to manage their networks in and between key cities. There will be significant demand for innovative materials that increase the resilience of transport infrastructure and allow in-time monitoring of asset quality and maintenance needs.

Supporting innovation through DfT grant funding

5.11 One way the Department supports such technology innovation is via grant schemes. In December 2016 we announced a £2.5 million uplift in funds for these grants. The Transport Technology Research Innovation Grant (T-TRIG) competition provides seed funding to early-stage science, engineering or technology innovations with potential to lead to development of successful new transport products, processes or services. Examples include:

- development of thermally conductive concrete slabs so that train station platforms can automatically de-ice themselves, thereby reducing accidents
- a smart country road reporting system, which uses sensors to collect real-time data to monitor the environment, road temperature and traffic flow
- a solar powered eBike charging solution to offer more sustainable travel choices

5.12 The Innovation Challenge Fund and RIS Innovation Fund also support development of new technologies, methods or processes that help meet DfT policy goals.

Funding, financing and efficiency

Alternative sources of funding

5.13 The scale of our ambition for transport investment means it is important we look to alternative sources of funding for the cost of infrastructure. Private funding allows either the full or partial cost of a project to be met by third party beneficiaries, reducing the burden on taxpayers and passengers. Funding can take a number of forms:

- **Direct contributions from the private sector**: where private sector firms and organisations stand to financially benefit from transport schemes, scheme promoters will often look to the private sector to provide direct contribution to the

capital cost of infrastructure provision. Attracting such funding can enable projects to go ahead or be built more quickly, or allow them to be delivered to a higher quality or with better value for money. In some cases, projects may be fully funded by other parties but there is a role for us to help delivery.

- **Use of developer contributions and business rate supplement:** Local authorities can levy charges on development to pay for the infrastructure needs. These include section 106 agreements between local authorities and developers attached to a planning permission to help provide infrastructure that is required to make a site acceptable in planning terms; the Community Infrastructure Levy (CIL) that ensures developers contribute to the cumulative impact on local areas; the Mayoral CIL, similar to the CIL but applied at a regional level in London; and Business Rate Supplement, where local authorities can add a supplement to business rates for infrastructure (subject to a local business referendum).
- **Hypothecation of existing income streams**: Local authorities can retain a proportion of business rates raised in their local area for investment in infrastructure.
- **Other public sector funds**: other sources of public sector funding may include the Local Growth Fund, the DCLG Housing Infrastructure Fund, and funding from Local Authorities.

5.14 We are committed to exploring opportunities for securing alternative sources of funding for transport investment where appropriate, in line with the key principle of "beneficiary pays". The effectiveness of such mechanisms depend on project conditions, and they will remain one lever in the wider funding package for transport investments. An example of where such mechanisms have been applied successfully is Crossrail, where the Mayoral CIL (MCIL) and other developer contributions reduced the overall costs to the public sector and the taxpayer. The Mayor is currently consulting on a second phase of MCIL to replace the existing scheme.

5.15 We expect our delivery partners to obtain third party contributions where possible, although the exact amount will be subject to negotiation. We will develop a series of principles to apply for where we promote such alternative sources of funding, most importantly that they provide better value for money and can allow timely delivery of projects.

Private finance models

5.16 As set out in section 4, the private sector owns and operates much of the UK's crucial transport infrastructure independently without central Government subsidy. Investment at these facilities is dictated by commercial considerations and by the functioning of a competitive market underpinned by effective regulation. However, in those instances where Government issues a licence to operate, such as in rail franchising, we ensure that resulting procurements take account of Government policies relating to promoting skills, employment and encouraging SME participation.

5.17 In addition, private finance models (where the private sector invests debt and equity to finance the capital cost of the project with the expectation of earning a return on investment over time from a funding source) for Government supported infrastructure offer the opportunity for Government to:

- access the discipline, skills and expertise of the private sector to deliver value for money to taxpayers and users through innovation, cost efficiencies and efficient risk transfer; and

- spread the cost of infrastructure investment over the life of the asset (subject to achieving the appropriate fiscal treatment).

5.18 We support the use of private finance models, including public private partnership models (PPPs), where they demonstrate they can provide the best value for money, and are consistent with other policy objectives, affordable and commercially viable. These models range in scale right up to the largest form of PPP projects.

5.19 We support the use of PF2, the Government's preferred form of PPP and will work with industry and the Infrastructure and Projects Authority (IPA) to identify projects that meet the PF2 criteria and that contribute to a pipeline of future opportunities.

5.20 We are actively seeking to consider opportunities where private finance can play a role in delivering better value for money, or help us deliver more quickly and innovatively. This will build on examples of where we have successfully used private finance before – for example, selling HS1 track access rights over 30 years to a consortium of investors largely composed of a Canadian pension fund.

5.21 However, we recognise that these approaches work best when there are a range of project opportunities, with the opportunity to earn a stable ongoing revenue stream, and with clear, transparent and consistent processes that increase investor certainty. We are working across government and with partners to identify opportunities to support this.

5.22 In addition to these established private finance models, the Government will continue to promote different ways of unlocking private capital for smaller investments. One example is the Residual Value mechanism used in rail franchising, which enables operators to develop long-term investment proposals which would otherwise not be commercially viable during the life of a standard franchise.

Driving efficiency

5.23 The Government is committed to driving public sector efficiency. The 2015 spending review mandated departments to generate efficiency savings between 2016 and 2020. Through this process, the Department for Transport has already identified £2.7bn of efficiency savings.

5.24 We are also working closely with the IPA, and other delivery partners (Crossrail, Highways England, HS2 Ltd, Network Rail, Transport for London), to equip ourselves to drive greater efficiency in the way we design, deliver and maintain transport infrastructure in the future.

5.25 Whilst we have a number of best practice processes to reduce the risk of inefficiencies, the scale and complexity of transport investment can create scope for costs to rise at all stages of the project cycle and for a number of different reasons. For example, costs can rise due to problems in project development or scoping/definition, due to poor procurement processes, or due to higher than expected maintenance costs after project delivery.

5.26 With Crossrail, Highways England, HS2 Ltd, Network Rail, Transport for London we are developing an Infrastructure Efficiency Strategy. It will focus on practical steps to help drive efficiencies and provide greater transparency on the whole life costs of investments by enabling the sharing of information about capital projects across the DfT family. This will be developed based on three key principles. First, the greatest opportunities for efficiency lie in collaboration and integration. Second, robust evidence is needed to understand performance and assess where we can incentivise innovation or address the key factors driving costs. Third, by looking across the DfT

family to highlight best practise, we can scale up 'what works' to support continuous improvement.

5.27 The Infrastructure Efficiency Strategy will identify practical ways in which we can deliver better value for money and better outcomes for passengers and users, drawing on existing best practice from across the DfT family as well as lessons learned from existing analysis such as the Infrastructure Cost Review (2010) and the Transport Infrastructure Skills Strategy (2016).

5.28 We will work closely with the IPA, who are reviewing how the Government, working with industry, can improve the quality, cost and performance of our infrastructure.

Meeting the Delivery Challenge

Innovative delivery models

5.29 Different delivery models can create innovative approaches to transport investment, allowing projects to be built more quickly and efficiently or to a higher quality. A range of models also allows for greater contestability, comparability and benchmarking of performance across delivery models, ultimately allowing lessons to be learned on the most effective, efficient and highest value for money models. That performance should include how the procurement has been carried out, with a view to maximising the value to the broader economy, support the creation of resilient supply chains, creating jobs and other local and legacy benefits proportionate to the size of the contract.

5.30 As we set out in Chapter 4, much of our focus has been on devolving delivery decisions and responsibility to local and regional or national transport bodies that have the right expertise to understand delivery needs in their areas. The department has also considered scope for increasing contestability and competition in decision-making, design and delivery, as well as the use of private finance models to support delivery.

5.31 We have introduced competition in specific areas of the network – for example franchising in the rail network – in order to increase competition, innovation and efficiency in delivering rail services for passengers. We are also looking to introduce greater contestability in rail delivery models to assess the scope for better delivery. For example, we intend to transform East West Rail into a new independent organisation to bring new ideas and skills to the way we deliver the reopening of the link from Oxford to Cambridge – a project that will support a range of opportunities including housing, business, science and innovation. East West Rail will aim to accelerate reopening of the route, and explore the opportunity to secure private sector involvement.

5.32 We will seize opportunities to test new and innovative delivery models where we can introduce fresh ideas, skills and innovation in delivery, and where they will allow greater comparability and benchmarking of performance, improving value for money.

Supporting skills and the supply chain

5.33 We set out in Chapter 2 how we recognise the challenges to the transport infrastructure supply chain associated with the significant increase in transport investment planned over the coming years. We are committed to tackling these challenges. We have committed to providing more certainty on investment through setting out five year plans for road and rail investment and through the National Infrastructure Delivery Plan. These commitments will provide certainty for the supply

chain to invest in longer-term skills strategies, but we will also continue to procure in a more strategic way to support UK supply chains, particularly but not exclusively SMEs, with a view to maximising the benefits from public spending.

5.34 The Industrial Strategy highlights the government's commitment to improving skills and improving procurement. A core element of the strategy is the focus on improving technical education, training and qualifications, particularly in key sectors such as infrastructure, and in Science, Technology, Engineering and Maths (STEM) subjects. On procurement, rolling out a balanced scorecard approach across major construction projects, including transport. We shall seek routes via which we can extend this principle to instances where procurement arises as a result of the Government issuing a licence to operate, such as in rail franchising, where we shall require the procuring bodies to follow an approach that delivers for the public good as well as commercial best practice.

5.35 Last year, we published our *Transport Infrastructure Skills Strategy*, highlighting the steps we are taking to support the supply chain and the development of skills in the transport infrastructure sector. We are working with the sector and supply chain partners to deliver our ambition for 30,000 apprenticeships in road and rail over the five years to 2020. And we have established the Strategic Transport Apprenticeship Taskforce to develop and implement the strategy and identify the sector's long-run skill and apprenticeship needs.

5.36 The *Transport Infrastructure Skills Strategy* also aims to encourage greater diversity in the workforce, including attracting more women into engineering. Linked to the Industrial Strategy, we are working to highlight opportunities for collaboration between transport employers, further education institutions and University Technical Colleges, and encouraging more investment in technical training programmes related to engineering, technology, design and other transport sector skills. We will encourage investment in research and innovation to encourage the development of skills that keep the UK sector seen as one of the best in the world. The taskforce will report annually on progress against these ambitions, with the first annual report expected later this month.

5.37 DfT will lead a 'Year of Engineering' in 2018 which will raise the profile of the sector and persuade more young people to consider an engineering career.

5.38 We will work closely with the supply chain and other partners, including the Infrastructure and Projects Authority, to address these delivery challenges and to better understand supply chain risks on market capacity, skills gaps and on drivers of construction cost inflation. We are reviewing our role as a client to see how we can better engage with the supply chain, make it easier for suppliers to work with us, reduce construction cost risks, improve decision making and coordinated planning, and create more certainty for the supply chain.

5.39 As set out in the Procurement chapter of *Building our Industrial Strategy*, the Government is building on good practice adopted in major infrastructure programmes such as Crossrail by encouraging those buying goods and services to take account of social and economic factors when designing their procurements. We are extending the 'balanced scorecard' approach recently developed by the Cabinet Office across all major construction, infrastructure and capital investment projects over £10 million, including the transport infrastructure projects and programmes in the National Infrastructure and Construction Pipeline. This should help UK-based suppliers compete effectively for government contracts throughout the supply chain, encourage innovative solutions, and maximise the positive impact of public procurement on strengthening the economy.

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