National Infrastructure Strategy

Fairer, faster, greener

HM Treasury

National Infrastructure Strategy

Presented to Parliament
by the Chancellor of the Exchequer
by Command of Her Majesty
November 2020

CP 329

Contents

Foreword 6

Executive Summary 8

Introduction 16

Chapter 1
Recovery and rebuilding the economy 20

Chapter 2
Levelling up the whole of the UK 26

Chapter 3
Decarbonising the economy and adapting to climate change 46

Chapter 4
Supporting private investment 66

Chapter 5
Building faster, better and greener 78

Chapter 6
Conclusion and next steps 94

OGL

© Crown copyright 2020

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit nationalarchives.gov.uk/doc/open-government-licence/version/3

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available at: www.gov.uk/official-documents

Any enquiries regarding this publication should be sent to us at public.enquiries@hmtreasury.gov.uk

ISBN 978-1-5286-2259-2

CCS1120538354 11/20

Foreword

Fairer, faster, greener

For decade after decade, governments of every political stripe have failed to invest enough in the UK's regions and nations. It is one of the reasons why the quality of our national infrastructure has fallen behind that of other countries. This Strategy will change that.

In almost my first words as Prime Minister, I promised to unite our country by physically and literally renewing the ties that bind us together. I promised to unleash the productive power not just of London and the South East, but of every corner of England, Scotland, Wales and Northern Ireland. I want to bring hope and opportunity for each part of the UK. Levelling up is my government's core purpose.

Our roads and our railways and our full-fibre cables join us together as one nation - the thigh bone connected to the hip bone, connected to the back bone, connected to the shoulder bone - but our national anatomy is creaking. Some of our organs, the cities, are congested and need relief. Some of our towns and villages, the largest part of the national body, are neglected and need attention. Some of our spine, the inter-city road and rail network, is old and needs renewal.

This document sets out our plan for a renaissance, backed by hundreds of billions of pounds of public and private investment. It is a response to the outstanding work done by the National Infrastructure Commission in assessing what the country needs. We will build that infrastructure, and redress long-standing inequalities, particularly in transport, between different parts of the UK. In recent years, we have spent heavily on the rail and road networks of London and the south-east, whose prosperity benefits us all. The fruits of that investment - Thameslink, Crossrail, new trains on the Underground, the future Lower Thames Crossing to relieve the M25 - will serve our economic engine well for many years.

But in the period covered by this strategy, we will significantly shift spending to the regions and nations of the UK. On our major A roads and motorways, two-thirds of our upgrades are outside south-eastern England, including dualling the A303 to the south-west and completing the first trans-Pennine dual carriageway in fifty years.

In public transport, all but one of the major new capital projects in the next few years will be outside the south-east. Northern Powerhouse Rail will connect Leeds and Manchester, and we will help make bus and rail networks in those and other city regions as good as Greater London's.

I know, too, that a multitude of smaller, local projects - better buses, and bypasses, and new stations, and cycle lanes - will do at least as much good as the megaschemes, and help more people. This strategy funds them too. We will restore many of the rail services lost in the Beeching cuts, pump money into local roads, and are providing £5 billion of extra funding to improve buses and cycling across the country, again on the model of London.

The Union Connectivity Review will examine new ways to bind together our United Kingdom, improving the links between our four nations. We have changed the Green Book, the government's guidance on how to assess potential investments, to help us address regional and Union imbalances.

And our environmental agenda, set out in our recent ten-point plan, is fully reflected in this Strategy, with ambitious commitments on energy, decarbonisation and clean economic growth driving us towards net zero in 2050. Our new industrial revolution will create and support up to 250,000 green jobs.

About half of all infrastructure spending is private, especially in energy, water and telecoms. We will reduce policy uncertainty that holds back investment and create a new national infrastructure bank to co-invest with private-sector partners. It will be available to metro mayors and local authorities. And it will be headquartered in the North of England: the place where the first infrastructure revolution, and arguably the modern world, was born.

The projects in this strategy, including £27 billion of public funding next year, will create wealth and thousands of jobs to repair some of the scars from the pandemic. We must build back better, not the same as before.

So we also start to ask how we should answer the new challenges caused by COVID-19, such as increased demand for roads; and how we can use the new levers the crisis has given us. We have learned, since March, that we can build new hospitals and testing labs more quickly than we ever imagined. We will use that experience to deliver motorway junctions, railways, and power stations more quickly too. We are in the buyer's market of a lifetime; we will use our weight as a major client to drive best practice in procurement.

In a world likely to be working less from the office, our massive gigabit-capable broadband programme looks more important than ever. It has enormous potential for levelling-up: with cheaper property, more relaxed lifestyles and superb internet connections, previously left-behind towns could become homeworking hubs.

Yet I also deeply believe in the future of cities and of other places where people can meet each other, challenge each other, spark off other people and create those magical flashes of creativity and invention. After months trapped on endless flickering video-conferences, we will want face-to-face contact more than ever. Some of our infrastructure needs will change because of COVID-19. Many will not.

Infrastructure will not, of course, level up Britain on its own. We must work on skills, on research and on innovation to create new, wealth-generating clusters - new Cambridges, new Thames Valleys - across the country. But this Strategy will put the calcium in our national bone structure and the collagen in our national skin tissue.

Boris Johnson
Prime Minister

Executive Summary

Infrastructure underpins the economy. Transport, digital, energy and utility networks are vital for jobs, businesses and economic growth. But they also have a profound impact on people's daily lives.

The government wants to deliver an infrastructure revolution: a radical improvement in the quality of the UK's infrastructure to help level up the country, strengthen the Union, and put the UK on the path to net zero emissions by 2050.

This Strategy sets out the government's plans to deliver on this ambition. It is the first of its kind: **rooted** in **the expert advice of the highly respected National Infrastructure Commission (NIC) and responding to its ground-breaking 2018 assessment of the country's infrastructure needs.**

Infrastructure is long-term. Decisions taken today on new rail lines, power plants, or road upgrades, will affect lives and livelihoods for decades to come. But infrastructure investment also has an important short-term role to help support jobs and stimulate the economy. This Strategy brings together the government's long-term goals with the short-term imperative to rebuild the economy following the COVID-19 pandemic.

COVID-19 continues to pose a huge challenge to the UK, as it does with every other major global economy. **The government will do whatever it takes to ensure the economy recovers as swiftly as possible.** In the summer, the government brought forward £8.6 billion of investment to support jobs during the pandemic. This Strategy sets out the government's plans to go further, to drive a strong and jobs-rich recovery.

As the government helps the economy to recover it will also seek to address the long-term issues that have held back UK infrastructure. These issues include 'stop-start' public investment, insufficient funding for regions outside of London, slow adoption of new technology, policy uncertainty that undermines private investment, and project delivery plagued by delays and cost overruns.

This Strategy sets out how the government will address these issues and do things differently: how it will build back fairer, faster and greener. It describes how the government will:

- **Boost growth and productivity across the whole of the UK, levelling up and strengthening the Union:** the government wants to level up communities and nations across the UK through investment in rural areas, towns and cities, from major national projects to local priorities;
- **Put the UK on the path to meeting its net zero emissions target by 2050:** bold action is needed to transform the UK's infrastructure to meet net zero and climate change commitments. The government will continue to decarbonise the UK's power, heat and transport networks – which together account for over two-thirds of UK emissions - and take steps to adapt to the risks posed by climate change;
- **Support private investment:** the UK has a proud record of attracting private investment into its infrastructure. But the government recognises investors have faced uncertainty in the past few years. This Strategy – and *the Energy White Paper* which will follow shortly – are aimed at providing investors with clarity over the government's plans, so they can look to the UK with confidence and help deliver the upgrades and projects needed across the country; and
- **Accelerate and improve delivery:** the government wants to transform the way infrastructure projects are delivered in the UK. This will be achieved through wide-ranging reforms from speeding up the planning system, to improving the way projects are chosen, procured and delivered, and greater use of cutting-edge construction technology.

This approach is underpinned by high levels of government investment, with record levels of investment for the railways, strategic roads, broadband networks and flood defences.

This Strategy also puts innovation and new technology at the heart of the government's approach. Every infrastructure sector could face transformative technological change over the next twenty years. From electric vehicles, to hydrogen heating systems, to 5G and its successors, new technologies have enormous potential to improve the environment and the daily lives of people across the UK. This Strategy will ensure the UK is at the forefront of this technological revolution.

The whole of the UK will benefit from this Strategy. Where policy is reserved for the UK government, this Strategy includes measures which will benefit every nation, such as a radical improvement in mobile coverage in rural areas. Where policy sits with the devolved administrations, Scotland, Wales and Northern Ireland will receive commensurate funding through the Barnett formula.

Driving recovery and rebuilding the economy

The COVID-19 pandemic has caused hardship for individuals, families and businesses across the UK. The health emergency has been accompanied by an economic shock of historic proportions. The government has responded with an unprecedented economic support package, and will do whatever it takes to ensure the economic recovery from COVID-19 is as swift and strong as possible.

Infrastructure investment will have a key role to play in the recovery, both by maintaining jobs in the short term, and creating the conditions for long-term sustainable growth. In the summer, the government brought forward £8.6 billion of capital investment in infrastructure, decarbonisation and maintenance projects, supporting thousands of jobs.

Now the government is going further. To support the recovery, government investment in economic infrastructure will be £27 billion in 2021-22. The government is also setting out longer-term settlements for key infrastructure programmes, with record levels of investment in strategic roads, rail, broadband and flood defences. Economic infrastructure is one part of overall public investment, which also includes other areas such as schools, hospitals, and defence. Spending Review 2020 delivers £100 billion total investment in 2021-22 to support the recovery.

This decision to press on with high levels of investment, despite the fiscal pressures COVID-19 presents, marks the government's commitment to end the stop-start pattern of investment that has been common in the UK in the past. Next year the government will review the fiscal remit for the National Infrastructure Commission, to ensure it reflects the government's long-term ambitions.

Public investment is only part of the story. Private infrastructure investment will be crucial for the UK's economic recovery from the pandemic. This Strategy sets out how the government will support private sector investment, including through a new infrastructure bank for the UK which will co-invest with the private sector, and through the Prime Minister's Ten Point Plan for a Green Industrial Revolution, which will mobilise tens of billions of pounds of private investment.

Finally, the pandemic has had a profound impact on the way people use infrastructure. Many of these changes will be temporary: aided by government, city centres will bounce back; aviation will return. But in some areas changes could endure: more home working is likely in future, and the surge in cycling seen in the past six months could continue. The government will work closely with the NIC and industry to understand the longer-term effects COVID-19 may have on UK infrastructure, and the implications for policy.

Levelling up and strengthening the Union

The government wants to use infrastructure to unite and level up the UK, delivering a stronger Union, thriving regions, cities living up to their full potential and revitalised towns and communities. To deliver this, the government is investing across the country, prioritising those areas that have received less support in the past.

Leaving no community or business behind

- £5 billion to support UK-wide gigabit broadband roll-out, a Shared Rural Network extending 4G mobile coverage to 95% of the UK, and £250 million to ensure resilient and secure digital networks;
- £5 billion over this parliament for buses and cycling; and
- A new £4 billion cross-departmental Levelling Up Fund that will invest in local infrastructure in England (which will attract funding for Scotland, Wales and Northern Ireland in the usual way).

Creating regional powerhouses, making cities the engines of growth and revitalising towns

- Supporting the largest city regions outside of London with £4.2 billion intra-city transport settlements;
- Backing new green growth clusters in traditional industrial areas, with carbon capture and storage, offshore wind, port infrastructure and low carbon hydrogen;
- Bringing jobs, investment and prosperity to some of the most deprived communities across the UK through the freeports programme;
- Revitalising over 100 town centres and high streets through the Towns Fund; and
- Restoring many of the rail services lost through the Beeching cuts of the 1960s.

Connecting the regions and nations of the UK, and creating a united and global Britain

- Backing HS2 to deliver essential North-South connectivity, with an Integrated Rail Plan to deliver transformational improvements in the Midlands and the North;
- Record investment in strategic roads (over £27 billion), including the A66 between Penrith and Scotch Corner, Lower Thames Crossing, and the A303 Stonehenge; and
- Delivering a Union Connectivity Review reviewing options to improve transport links across the four nations of the UK.

And changing how decisions are taken:

- Increasing the UK government's ability to invest directly in Scotland, Wales and Northern Ireland through the UK Internal Market Bill;
- Changing the way projects are appraised to support levelling up through the Green Book Review;
- Expanding devolution within England, and implementing the devolution deal in West Yorkshire;
- Relocating 22,000 civil servants out of London and the South East by 2030.

Decarbonising the economy and adapting to climate change

As set out in the Prime Minister's Ten Point Plan for a Green Industrial Revolution, infrastructure investment is fundamental to delivering net zero emissions by 2050. The government will unlock private sector investment to accelerate the deployment of existing technology, such as retrofitting the UK's building stock and electrification of vehicles, while advancing newer technologies such as carbon capture and low-carbon hydrogen. The government's approach will create jobs to support the recovery from COVID-19, and support the government's levelling up agenda by ensuring key industrial areas are at the heart of the transition to net zero. The UK is already decarbonising faster than any other G20 country. As hosts of the UN Climate Change Conference COP 26 next year, the UK will go even further to promote the importance of low-carbon infrastructure and support its commitment to the Paris Agreement. Key measures include:

- Significant investment in offshore wind and into modern ports and manufacturing infrastructure to expand the share of energy generation from renewables;
- Providing up to £525 million to bring forward large-scale nuclear and invest in the development of advanced nuclear technologies;
- £1 billion to support the establishment of carbon capture and storage in four industrial clusters;
- Investing in hydrogen to scale up the UK's capacity to produce both 'blue' and 'green' hydrogen;
- Investing £1.3 billion in charging infrastructure to accelerate the mass adoption of electric vehicles ahead of ending the sale of new petrol and diesel cars by 2030;
- Enabling heat decarbonisation by supporting the roll-out of existing technologies like heat pumps and development of emerging technologies like hydrogen;
- Funding to help England to meet its share of the Climate Change Committee's recommendations to plant 30,000 hectares of trees a year in the UK; and
- Investing £5.2 billion by 2027 to better protect 336,000 properties and boost resilience of communities to the increased risk of flooding and coastal erosion resulting from climate change.

Supporting private investment in infrastructure

Private investment has delivered major benefits for UK infrastructure and will be critical over the coming decades as the UK moves towards meeting net zero in 2050. The government is committed to supporting private investment and is taking action across the following areas:

- The government is setting up a new UK infrastructure bank, to co-invest alongside the private sector in infrastructure projects;
- The bank will operate UK-wide, be based in the North of England, and support the government's ambitions on levelling up and net zero;
- The bank will also be able to lend to local and mayoral authorities for key infrastructure projects, and provide them with advice on developing and financing infrastructure;
- The government is committed to the model of independent economic regulation, but will refine it to ensure it provides a clear and enduring framework for investors and businesses and delivers the major investment needed in decades to come, while continuing to deliver fair outcomes for consumers;
- The government will produce an overarching policy paper on economic regulation in 2021, which will consider regulator duties, how to inject more competition into strategic investments and the benefits of a cross-sectoral Strategic Policy Statement; and
- The government will continue to develop new revenue support models and consider how existing models – such as the Regulated Asset Base model and Contracts for Difference – can be applied in new areas, and remains open to new ideas from the market. The government will not reintroduce the private finance initiative model (PFI/PF2).

Accelerating and improving delivery

The government wants to deliver infrastructure projects better, greener and faster. That means addressing longstanding challenges such as complex planning processes, slow decision-making, and low productivity in the construction sector. It also means learning lessons from the COVID-19 pandemic, for instance from the approaches that built Nightingale Hospitals in record time, and saw the UK move swiftly to secure access to a range of promising vaccines. Further, there is a clear opportunity with EU exit to change how this government delivers projects, using the flexibility the UK has as a sovereign country to do things differently.

The government set up Project Speed in the summer, to review every part of the infrastructure project lifecycle and identify where improvements could be made. Project Speed has developed a comprehensive package of reforms, including:

- Reform of environmental regulations to deliver a quicker and simpler framework for assessing environmental impacts and secure better outcomes for the environment;
- Landmark reform of the planning system including consulting on amending permitted development rights, to let schools and hospitals be expanded quickly;
- Transforming the construction sector to enable it to become more productive, more sustainable and more internationally competitive, with better use of data and modern methods of construction;
- Ensuring more effective decision making with streamlined approval processes, more emphasis on quality design, and better monitoring and evaluation;
- Embedding good design in all infrastructure projects through planning reforms; and
- Bringing about a step change in capability and leadership, accelerating investment in major project expertise and delivery skills and improving the skills base across the country to ensure every area can deliver the infrastructure it needs.

These reforms have already driven substantial progress, and in future mean the UK's vital infrastructure like schools, hospitals, transport and other networks will be delivered better, greener and faster:

- Better, because the process of assessing infrastructure projects under the revised methodology will ensure the government is valuing the wider economic, social and environmental benefits of a project. The government will set projects up to succeed by strengthening the assurance and decision-making regime.
- Greener, because the requirements of the net zero commitment will be considered in every stage of the project lifecycle and underpin decisions on the technical solutions chosen to achieve the required outcomes.
- Faster, by simplifying and shortening the processes through which projects secure the consents they need to proceed, procure contracts and deliver; while using modern methods of construction, new skills and a strategic relationship with industry which will improve productivity.

Conclusion and next steps

This Strategy clearly sets out the government's long-term infrastructure ambitions:

- **It provides a long-term perspective** without ignoring shorter-term imperatives;
- **It sets out clear goals and plans to achieve them,** with more detail to come in some areas over the coming weeks and months;
- **It announces multi-year funding commitments** for many key infrastructure programmes; and
- **It confirms the government's commitment to fundamentally change** the way it considers and delivers infrastructure across the whole of the UK.

However, this isn't the final word on the government's infrastructure plans – it instead represents the first step of a multi-year process to transform the UK's infrastructure networks. This Strategy will also be followed by a series of detailed publications setting out further details on key areas of infrastructure policy, including the Construction Playbook, Energy White Paper, English Devolution and Local Recovery White Paper, a refreshed Industrial Strategy, Union Connectivity Review and an updated National Infrastructure and Construction Pipeline.

The government is also setting out new priorities for the National Infrastructure Commission, including commissioning a new study on greenhouse gas removal technologies, and preparing to appoint additional Commissioners.

Introduction

This National Infrastructure Strategy comes at an historic time. COVID-19 has caused a significant health and economic shock. The UK has left the European Union and is fully independent and self-governing for the first time in 45 years, creating new opportunities to do things differently. **This is the moment to build back better, to create world-class infrastructure across the whole UK, and to transform people's lives for decades to come.**

Infrastructure is the backbone of the economy – vital to jobs, economic growth and quality of life for people across the UK. It affects everybody's daily lives in profound ways. The government's commitment to unite and level up the UK is more urgent than ever, and infrastructure will be crucial in renewing the fabric of the country.

The UK has a proud history of building infrastructure – from the railways that brought forth the industrial revolution to the Thames Barrier that protects millions from flooding each year. **But there are long-standing challenges that have held back the UK's infrastructure:** insufficient and costly 'stop-start' public investment; a lack of focus on the potential of great urban centres; slow adoption of new technology; policy uncertainty undermining private investment; and sluggish delivery, with projects too often delayed.

This National Infrastructure Strategy tackles these challenges. Rooted in the authoritative and impartial advice of the National Infrastructure Commission (NIC), it sets out how infrastructure can support the immediate economic recovery and the government's ambition to transform the UK's infrastructure networks over the next decade and beyond.

This Strategy marks the first decisive step change in the nation's infrastructure ambitions. The government's vision is for:

- **A united UK with thriving communities, cities, regions and nations**, with quality infrastructure giving everyone, everywhere opportunities to succeed. Communities will be brought together, broadband connectivity will be better, commutes will be shorter and delays will be fewer;
- **Greener and more beautiful places,** with cleaner air, more green spaces, green buses, more cycling, low-carbon and energy efficient homes, and better high streets for UK towns;
- **The UK to be a world leader in new technologies,** including wind power, hydrogen production carbon capture and storage, nuclear power, electric vehicles and zero emission planes; and
- **A stable and robust regulatory and delivery system,** leading to sustained public and private investment to support innovation, delivering projects better, faster and greener.

Addressing long-standing challenges

The COVID-19 pandemic has introduced enormous short-term disruption, and may have long-term effects on the way people live, for instance with less daily commuting. However, this does not undermine the long-term arguments for infrastructure: the UK still needs to invest in digital, transport and utilities networks to underpin economic recovery and growth. It does mean that the government will have to continue to refine its approach to infrastructure investment in response to the impacts of COVID-19 in the years to come.

Chapter 1 of this Strategy focuses on how infrastructure can boost short term economic growth and drive the recovery from COVID-19. It sets out how *Spending Review 2020* delivers high levels of investment to support the economic recovery, with long-term settlements for key infrastructure programmes.

Chapter 2 focuses on levelling up the economy. The UK's major cities and regions are not as productive as international comparators. Towns and regions are held back by inadequate and out of date infrastructure, making it hard for people to get to work, run businesses and attract international investment. The UK's transport networks are ageing and congested and UK gigabit broadband coverage lags behind many competitor countries. There are also problems with poor infrastructure connecting the four nations of the UK. **This strategy announces an ambitious package of plans to level up the nations, regions, cities and towns of the UK and strengthen the Union** – with vastly improved broadband, road and rail networks connecting up the country, investments to boost cities, towns and communities, and getting the basics right everywhere with better roads, buses and cycling infrastructure. This is underpinned by changes in how and where decisions are made, to better reflect local and national needs.

The UK has made substantial progress in reducing carbon emissions from its power networks and the cost of renewables has fallen sharply – **but bold action is now needed to transform the UK's infrastructure to meet net zero and climate change commitments** as one of the world's leading, modern, sustainable economies.

In line with the Prime Minister's *Ten Point Plan for a Green Industrial Revolution*, **Chapter 3 sets out the government's plans to decarbonise power, heat, heavy industry and transport networks** - which together account for over 80% of UK emissions - and how to adapt to the risks posed by climate change.[1]

The UK has a proud record of attracting private investment into its infrastructure, and this will be even more vital in delivering on its net zero targets. But the government recognises that investors have faced some uncertainty in the past few years. **Chapter 4 of this Strategy sets out the government's plans to support private investment in infrastructure**, including by establishing **a new UK infrastructure bank**, to harness private capital investment.

Finally, infrastructure delivery in the UK has been too slow for too long. The COVID-19 pandemic has shown that this doesn't have to be the case; for instance the Nightingale hospitals were assembled in record timescales. **Chapter 5 sets out the steps the government is taking to accelerate and improve infrastructure delivery.** This will be achieved through wide-ranging reforms coming out of the Project Speed taskforce, from speeding up the planning system, to improving the way projects are chosen and run, reforming the way the government procures, and using cutting edge construction technology.

The whole of the UK will benefit from this Strategy. Where policy is reserved for the UK government, this Strategy includes measures which will benefit every nation of the UK, such as a radical improvement in mobile coverage in rural areas. Where policy sits with the devolved administrations, those governments will receive funding through the Barnett formula for the benefit of Scotland, Wales and Northern Ireland.

The journey doesn't stop here. Successful delivery of this plan will require collaboration across all parts of government, industry and civil society. The government will be following up this Strategy with further detail on a number of areas – including the English Devolution and Local Recovery White Paper and the Energy White Paper. The final chapter of this strategy sets out what the government will do next to deliver on its ambitions.

The case for infrastructure investment

High quality infrastructure is crucial for economic growth, boosting productivity and competitiveness. It helps connect people to each other, people to businesses, and businesses to markets, forming a foundation for economic activity. Infrastructure acts as a direct 'input' for businesses, which rely on energy, transport and waste collection to operate. Well-developed transport and digital networks allow businesses to grow and expand, enabling them to extend supply chains, deepen labour and product markets, collaborate, innovate and attract inward investment. These 'agglomeration' effects are particularly powerful in city regions, where high quality infrastructure can play a substantial role in boosting productivity. But they also apply more broadly.

Infrastructure can also support other government policy objectives. For instance, it can improve skills and education through investment in digital technology and buildings. It is a key factor in determining where firms choose to locate and grow, and people's ability to access resources.

However, the size of the UK's capital stock (a measurement of the value of the UK's current infrastructure networks) is generally considered to be smaller than comparable economies.[2]

In 2019 the World Economic Forum (WEF) ranked UK infrastructure 11th in the world, behind comparable European economies such as France, Germany and the Netherlands.[3] The UK also falls well behind other countries on a sector-by-sector basis. For instance, WEF rank the UK 36th for the quality of its road infrastructure, and 79th on fibre internet subscriptions.

Businesses and communities also need consistency and certainty about planned infrastructure. For a long time, investment in UK infrastructure has been volatile and stop start. Previous governments have increased investment and then cut back. This has created a fractured supply chain, exposed to significant vulnerability, and is part of the reason why the UK has a lower infrastructure stock than in many other countries.

This means that increasing both public and private investment, whether in order to reduce some of the highest levels of road congestion in Europe,[4] or increasing gigabit-capable broadband access to continue to catch up to international competitors,[5] would have a relatively larger impact on growth and living standards in the UK.[6]

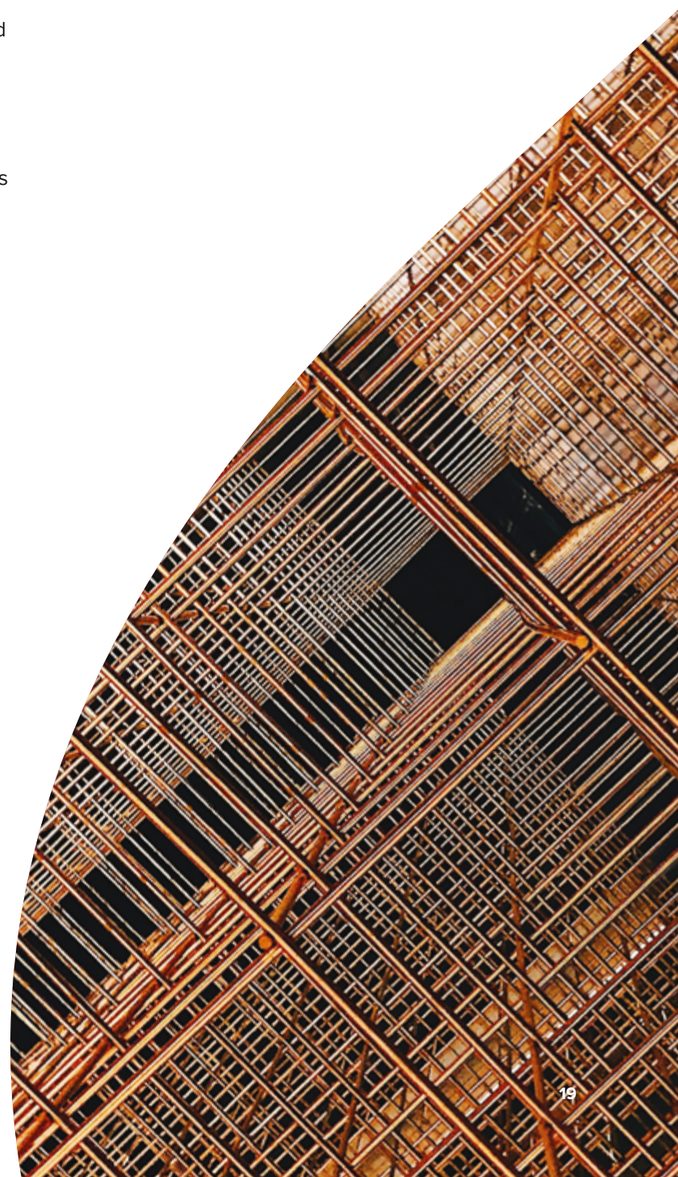
The National Infrastructure Commission

The government set up the NIC in 2015, with the aim of providing impartial, expert advice on major long-term infrastructure priorities. The NIC published its first *National Infrastructure Assessment* in July 2018.[7] This comprehensive report set out the Commission's assessment of the UK's infrastructure needs over the next 30 years, and made a series of recommendations to the government across all areas of economic infrastructure: energy, transport, water and wastewater (drainage and sewerage), waste, flood risk management and digital communications.

The NIC recommendations have already substantially influenced the government's infrastructure agenda and provided the foundations for many of the measures announced in this Strategy and at previous fiscal events. This Strategy provides the government's formal response to the NIC's recommendations. But it also goes further, setting out the next steps in the government's plans for a step change in UK infrastructure policy. A detailed response to each NIC recommendation is provided alongside this Strategy in *Response to the National Infrastructure Assessment.*

This is the first time the government has responded to such a comprehensive assessment of the UK's infrastructure needs: the government intends to undertake a similar exercise and update this Strategy every five years, in response to future National Infrastructure Assessments.

In line with the NIC's remit, this Strategy focuses on economic or networked infrastructure: energy, transport, water, waste, flood risk management and digital communications. However, the reforms to project delivery will clearly benefit all forms of capital projects, including social infrastructure such as schools, hospitals and prisons. Further detail on the government's plans for social infrastructure investment are set out in *Spending Review 2020*.



Recovery and rebuilding the economy

At a glance

The COVID-19 pandemic has caused hardship for individuals, families and businesses across the UK. The health emergency has been accompanied by an economic shock of historic proportions. The government has responded with an unprecedented economic support package, and will do whatever it takes to ensure the economic recovery from COVID-19 is as swift and strong as possible.

Infrastructure investment will have a key role to play in the recovery, both by maintaining jobs in the short term, and creating the conditions for long-term sustainable growth. In the summer, the government brought forward £8.6 billion of capital investment in infrastructure, decarbonisation and maintenance projects, supporting thousands of jobs.

Now the government is going further. To support the recovery, government investment in economic infrastructure will be £27 billion in 2021-22. The government is also setting out longer-term settlements for key infrastructure programmes, with record levels of investment in strategic roads, rail, broadband and flood defences. Economic infrastructure is one part of overall public investment, which also includes other areas such as schools, hospitals, and defence. Spending Review 2020 delivers £100 billion total investment in 2021-22 to support the recovery.

This decision to press on with high levels of investment, despite the fiscal pressures COVID-19 presents, marks the government's commitment to end the stop-start pattern of investment that has been common in the UK in the past. Next year the government will review the fiscal remit for the National Infrastructure Commission, to ensure it reflects the government's long-term ambitions.

Public investment is only part of the story. Private infrastructure investment will be crucial for the UK's economic recovery from the pandemic. This Strategy sets out how the government will support private sector investment, including through a new infrastructure bank for the UK, which will co-invest with the private sector, and through the Prime Minister's Ten Point Plan for a Green Industrial Revolution, which will mobilise tens of billions of pounds of private investment.

Finally, the pandemic has had a profound impact on the way people use infrastructure. Many of these changes will be temporary: aided by government, city centres will bounce back; aviation will return. But in some areas changes could endure: more home working is likely in future, and the surge in cycling seen in the past six months could continue. The government will work closely with the NIC and industry to understand the longer-term effects COVID-19 may have on UK infrastructure, and the implications for policy.

The UK is experiencing a health and economic shock of historic proportions. The threat posed by COVID-19 has forced governments around the world to restrict activity to control the virus. The government fully recognises what a challenging period this is for the British people and for businesses across the economy, and will do whatever it takes to ensure the UK recovers as quickly and strongly as possible.

The government has responded with an unprecedented set of economic support measures, including the Coronavirus Job Retention Scheme (CJRS) which has supported millions of jobs across the economy, and further tax cuts and deferrals, grants and loans for businesses.

The pandemic has also profoundly affected the way people use infrastructure – planes have been grounded, trains left empty. Digital infrastructure has been crucial in keeping people connected. The number of people cycling has surged. There has been additional pressure on parts of the road network.

Within infrastructure, the transport sector has been the most heavily impacted, with dramatic falls in demand across many modes. Over the period, the government has responded with a series of targeted aid packages:

- The government is supporting the aerospace sector and its aviation customers with over £9 billion support through the Bank of England's COVID-19 Corporate Financing Facility, grants for research and development, loan guarantees and support for aerospace exports. In addition, the government has provided £5.7 million funding to air passenger services between Great Britain and Northern Ireland to ensure those who needed to travel could continue to do so;
- The government is safeguarding vital transport links to the mainland for people living on the Isle of Wight and the Isles of Scilly, including an emergency package of up to £10.5 million for lifeline ferry services;
- The government has provided more than £3 billion to support local light rail and bus networks, across the country to keep cities moving, including London, and maintain connectivity; and
- The government has stepped in to keep train services running in spite of severely reduced passenger demand. While these temporary arrangements are in place, the government will make an early start on key reforms and ensure a new and better type of rail network emerges following the pandemic.

The breakthroughs that have been achieved in vaccine development shows that an end to the pandemic is in sight. But some of the behavioural changes seen through this period are likely to endure. For instance, people are likely to spend more time working from home in future, making the government's plans to deliver gigabit broadband across the country even more important. Many people who have started cycling to work will continue to do so.

But in other areas, the economy may return to similar patterns to before the pandemic. For instance, cities will still be key engines of growth, with people and businesses clustering to drive and benefit from innovation. The government's plans for greater funding for city-regions will be key.

All of this creates questions for the government, such as how to address increased demand for space on the roads? And how to rebuild confidence in public transport as the pandemic eases? The government will work closely with industry, consumers and the NIC to address these questions.

It is also clear that COVID-19 has had a particularly harsh impact on the North of England, making the government's levelling up agenda even more pressing than before.

The government's immediate focus now is on ensuring infrastructure investment and policy support the recovery. Infrastructure investment can boost jobs, while also increasing growth and productivity. That is the government's aim through *Spending Review 2020*.

Infrastructure and public health

As well as being vital for the economy and productivity growth, infrastructure is also a key driver of public health outcomes.

The pandemic has proven that taking steps now to increase overall public health – by improving air quality and encouraging cycling and walking to fight obesity – will pay dividends over the longer-term as the UK focuses on economic and physical recovery. The government is reflecting this priority in its approach to infrastructure investment.

The COVID-19 pandemic has shown that many people need to think harder about their health, and the lifestyle changes which might help them be more active and stay fit. Investment in active travel is critical to this. Government support for cycling and walking helps tackle obesity by providing ways for people to exercise as well as get from A to B, while measures to decarbonise the economy and reduce congestion will help improve air quality – and therefore health – across the UK.

This year has also highlighted the benefits of having truly local green space for mental and physical health and wellbeing, as well as highlighting the deficit in accessible green space for some communities and in deprived areas. The government is developing a National Framework of Green Infrastructure Standards for England that will show what good green infrastructure looks like, and help local authorities, developers and communities to improve provision in their area.

Infrastructure and the recovery: the 2020 Spending Review

The government is committed to major investment, not just in the infrastructure sectors covered in this document, but also in other sectors including health, education, science and defence. **Spending Review 2020 delivers £100 billion total investment in 2021-22 to support the recovery.** This is part of the government's plans to invest over £600 billion over the next five years, delivering the highest sustained levels of public sector net investment as a proportion of GDP since the late 1970s.

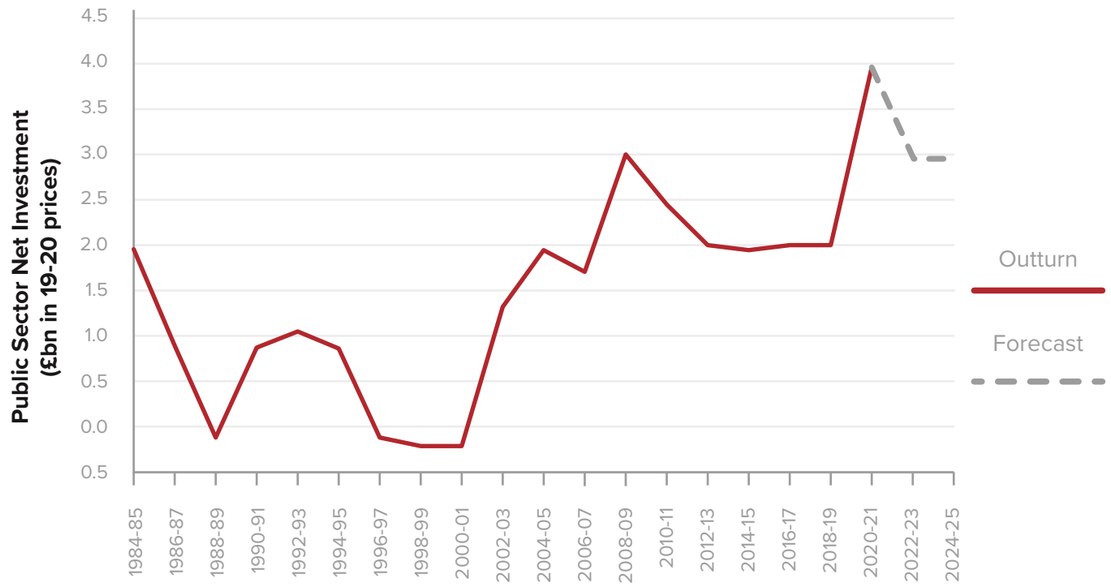
The economic infrastructure sectors covered in this document, such as transport, energy and digital communications form a key part of these plans. **Next year the government will spend £27 billion in these sectors.**[8]

As well as setting budgets for next year, the Spending Review announces longer-term budgets for key capital programmes and projects. This includes funding for HS2 – the biggest infrastructure project in Europe – and record levels of investment in programmes for strategic roads, flood defences and broadband. Further details are set out in *Spending Review 2020*.

Taken together, these spending commitments mark a clear step change in the UK's approach to infrastructure investment. Too often in the past, governments have invested too little in infrastructure, or investment has been done on a stop-start basis. This government is committed to end that, recognising that climate change, regional inequality and low productivity are long-term challenges that require a sustained commitment.

Public investment is only part of the story. Much of the UK's infrastructure is financed by the private sector, and **private investment will be crucial for the UK's economic recovery from the pandemic.** This Strategy sets out how the government will support private sector investment. This includes the introduction of a major new national infrastructure bank to catalyse investment in infrastructure projects. And this Strategy delivers on the Prime Minister's *Ten Point Plan for a Green Industrial Revolution*, which is intended to mobilise tens of billions of pounds of private investment.

Public sector net investment since 1984-85 to 2025-26



Source: OBR. Sharp increase in 2020-21 is driven by the upfront cost of expected future calls on government guaranteed loans and a fall in GDP

The National Infrastructure Commission's fiscal remit

The National Infrastructure Commission's (NIC's) Charter commits the government to setting a binding fiscal remit to ensure that the NIC's recommendations remain affordable. While the need for infrastructure investment is clear, the government remains committed to fiscal sustainability, and is mindful of the significant fiscal pressures that exist over the short- and medium-term. The fiscal remit aims to strike an appropriate balance.

The fiscal remit refers to investment in those sectors covered by the NIC: transport, energy, flood risk management, digital communications, water, and waste. The fiscal remit is designed to ensure that the NIC clearly prioritise their recommendations and explain which they consider are most critical in addressing the country's long-term infrastructure needs.

In 2016 the government set the NIC's fiscal remit at between 1-1.2% of GDP. This means that the NIC must be able to demonstrate that its recommendations are consistent with gross public investment in economic infrastructure of between 1% and 1.2% of GDP in each year between 2020 and 2050. This remit applies to both the National Infrastructure Assessment and specific studies.

The government is committed to increasing infrastructure investment to drive the economic recovery and make progress against its longer-term plans, and it is important that the NIC's fiscal remit reflects these ambitions. However, given current economic uncertainty, now is not the right time to definitively update the remit. Instead, the government will review the NIC's fiscal remit in detail next year, to ensure it continues to reflect the government's ambitions as the NIC prepare to publish their second National Infrastructure Assessment. In the meantime, the government will maintain the NIC's fiscal remit at a minimum of 1-1.2% of GDP.

Delivering on these commitments

The construction industry is essential to maintaining and delivering vital infrastructure services, including transport and utilities networks, and ensuring public safety by delivering critical public health facilities and remediating unsafe buildings. But the sector also faces long-term challenges. It is fragmented when compared to those in other countries; struggles to raise investment for innovation; and in the UK has had to manage significant cycles of public investment increases and cuts.

The construction sector has responded well to the pandemic, working closely with government and key stakeholders to ensure sites can remain open and activity can continue safely. But the government recognises the challenges the sector is still facing now, with uncertainty weighing on private investment. While the majority of construction sites have now reopened, the sector still faces significant challenges as a result of reduced private sector demand and the knock-on impact this has for job retention and financial health.

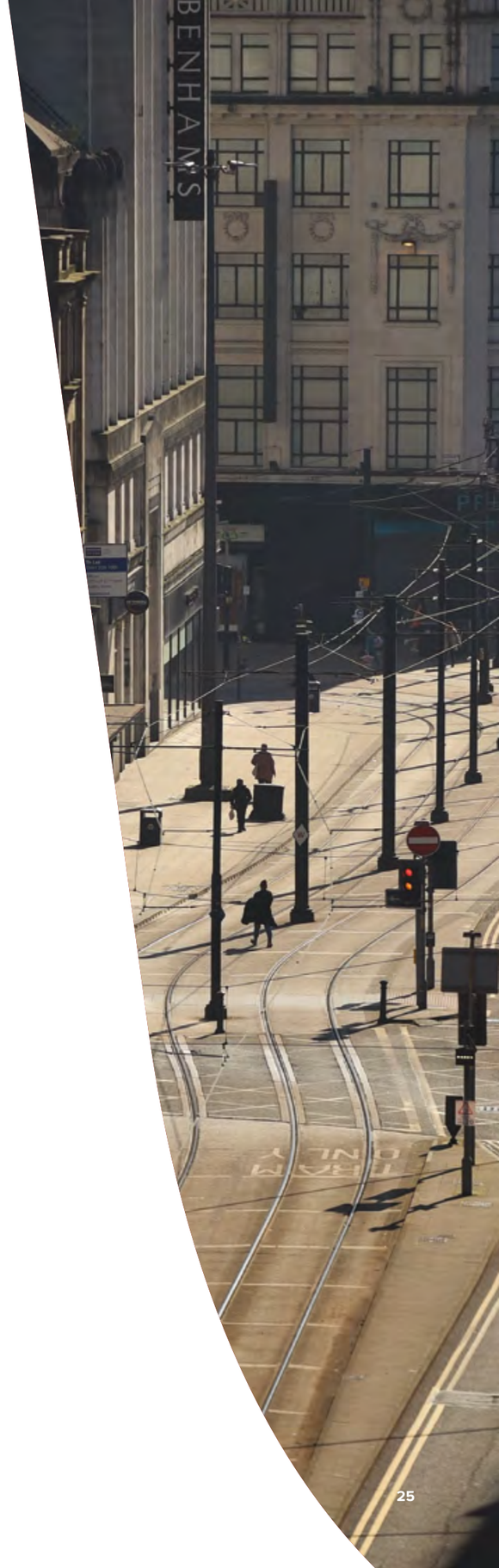
Continuing to progress the UK's ambitious infrastructure plans in all parts of the country is vital to the recovery of the construction sector, and the economy as a whole. The government is continuing to do everything it can to ensure that construction sites are able to remain open and operate safely, so that the industry emerges from the pandemic with the capability and capacity to deliver this Strategy.

By ramping up investment progressively in a structured way, the government's ambition is to eliminate the peaks and troughs that have proved destabilising for the supply chain in the past. The government has taken a balanced approach between new and existing assets, as well as delivering more local and regional enhancements to create a varied pipeline in terms of the size and location of projects. This will result in commercial opportunities to small and medium-sized enterprises as well as large contractors.

Alongside ongoing major projects such as HS2, in the immediate-term new investment will be targeted at smaller local schemes to upgrade existing infrastructure. These projects can be taken through planning and development quickly to provide employment opportunities in the UK construction sector that would otherwise be affected by COVID-19 and decreasing private sector demand.

HM Treasury is strongly encouraging all government departments and their agencies to progress approved and funded projects into procurement and contract without delay (subject to good project discipline). This includes continuing to publish a comprehensive *National Infrastructure and Construction Pipeline*, with the next update in Spring 2021.

The government is also urging local authorities to take steps to preserve construction jobs in their areas by progressing funded projects as soon as practicable. Finally, the government will use its weight as a major construction client to transform and modernise the industry, through the publication and implementation of the *Construction Playbook.*



Levelling up the whole of the UK

At a glance

The government wants to use infrastructure to unite and level up the UK, unleashing the potential of the Union, thriving regions, cities living up to their full potential and revitalised towns and communities. To deliver this, the government is delivering major investment across the country, prioritising those areas that have received less support in the past.

Leaving no community or business behind

- £5 billion to support UK-wide gigabit broadband roll-out, a Shared Rural Network extending 4G mobile coverage to 95% of the UK, and £250 million to ensure resilient and secure 5G networks;
- £5 billion over this parliament to transform bus services and cycling infrastructure;
- A new £4 billion cross-departmental Levelling Up Fund that will invest in local infrastructure in England (which will attract funding for Scotland, Wales and Northern Ireland in the usual way); and
- £5.2 billion by 2027 to better protect communities from flooding and coastal erosion.

Creating regional powerhouses, making cities the engines of growth and revitalising towns

- Supporting the largest city regions outside of London with £4.2 billion intra-city transport settlements;
- Backing new green growth clusters in traditional industrial areas, with carbon capture and storage, offshore wind, port infrastructure and low carbon hydrogen;
- Bringing jobs, investment and prosperity to some of the most deprived communities across the four nations of the UK through the freeports programme;
- Revitalising over 100 town centres and high streets through the Towns Fund; and
- Restoring many of the rail services lost through the Beeching cuts of the 1960s.

Connecting the regions and nations of the UK, and creating a united and global Britain

- Backing HS2 to deliver essential North-South connectivity, with the Integrated Rail Plan delivering transformational improvements in the Midlands and the North;
- Record investment in strategic roads (over £27 billion), including the A66 between Penrith and Scotch Corner, Lower Thames Crossing, and the A303 Stonehenge; and
- Delivering a Union Connectivity Review identifying options to improve transport links across the four nations of the UK.

And changing how decisions are taken

- Increasing the UK government's ability to invest directly in Scotland, Wales and Northern Ireland through the UK Internal Market Bill;
- Changing the way projects are appraised to support levelling up through the Green Book Review;
- Expanding devolution within England, and implementing the devolution deal in West Yorkshire; and
- Relocating 22,000 civil servants out of London and the South East by 2030.

The government's vision is to level up the whole of the UK and deliver a stronger Union between Scotland, Wales, Northern Ireland and England. The growth of every region and nation in the UK is vital, not just to boost economic growth and productivity, but to create a stronger, fairer and more inclusive society.

Great nations, where opportunity and talent are spread evenly, depend on great infrastructure. Although not the only factor – skills, local leadership and business environment are also fundamental – infrastructure plays a crucial role in resolving disparities between places. Better infrastructure networks can have a transformative effect on economic and social outcomes as they connect people, either physically or digitally, to opportunities.

Some parts of the UK lead the world as great places to live, work and do business, in part due to excellent infrastructure. The government will draw on its experience in these places to **create a new infrastructure anatomy that unites and levels up the whole of the UK**.

First, **the government will ensure that no citizen, community or business is left behind**, by connecting them to the next stage of the digital revolution and ensuring that they can get around their local community with well-maintained local roads. The government is also improving the essential, everyday features of peoples' lives; faster and greener buses that markedly improve the commute, and high quality, well integrated cycling infrastructure that sparks a gear change in the way people ride.

Second, **re-balancing the UK relies on boosting the cities and towns** most in need. Cities are the anchors of successful regions across the world; they are engines of growth. To drive economic growth across all regions of the UK, the government is investing in growth in cities. But over half the UK's population live in towns, many of which have suffered economic and social decline over decades. The government is investing in infrastructure revitalise towns, as well as to drive their economic regeneration.

Third, the government will **connect the nations and regions of the UK**, building infrastructure networks that bring together the whole of the UK. To level up and unite the country, cities across the UK must also be accessible to each other, to support trade across regions and spread growth from south to north, east to west and back again. The government is investing in national transport and pivoting investment away from London, ensuring every region has great connectivity.

Fourth, **maintaining the UK's position as a global trading nation** also requires infrastructure that connects the country to its international partners - linking businesses to valuable markets and to support trade and investment. The government is supporting private sector investment to improve infrastructure for international freight and aviation.

Finally, **this will require doing things differently**, including changing how investment and policy decisions are made. This means ensuring that decisions are not just made in Whitehall but reflect the diversity of this country, empowering local areas and leaders, but also ensuring decisions can be made for the UK as a whole where appropriate. It is vital that decision-making frameworks such as the Green Book also reflect the government's levelling up agenda.

Infrastructure across the Union

As responsibility for much infrastructure is devolved, the devolved administrations receive funding through the application of the Barnett formula in line with investment decisions taken by the UK government. This funding ensures the devolved administrations have the means to invest in infrastructure to support people and businesses in Scotland, Wales and Northern Ireland.

Infrastructure sector	Devolved Administration responsibility		
	Scotland	Wales	Northern Ireland
Transport	Largely devolved	Largely devolved, aside from rail and aviation	Devolved
Energy	Not devolved, aside from energy efficiency	Not devolved, aside from energy efficiency	Devolved, aside from nuclear
Digital	Not devolved	Not devolved	Not devolved
Waste and sewage	Devolved	Devolved	Devolved
Flood risk	Devolved	Devolved	Devolved
Waste	Devolved	Devolved	Devolved

Source: National Infrastructure Commission

Leaving no community or business behind

From Teeside to Tonbridge, from Bury to Bristol, from Lewis to Lewes, and from Portadown to Penzance, the government is determined to level up the opportunities available everywhere, boosting jobs, wages and prospects for all communities. The economic opportunities available to many people depend on where they were born, grew up and still live – around 40% of the UK population live within the local area where they were born.[9] These economic opportunities are therefore dictated in practice by the nature of their local economy.

This is why the government is also taking action to deliver local roads, buses, cycling, better digital connectivity and flood defences across the country. Where policy is devolved the devolved administrations will receive funding through the application of the Barnett formula in line with the decisions taken by the UK government. Where policy is reserved - for example digital infrastructure - the UK government is focused on improving connectivity for the whole of the UK.

Rural communities in particular rely on strong infrastructure networks to support their local economies, and these must be well-thought through and maintained. The government's long-term ambition is for people and businesses in rural areas to be able to easily access and unlock opportunity, as in other parts of the UK by improving connectivity.

Investing in local priorities

The government is creating a new £4 billion Levelling Up Fund that will invest in local infrastructure that has a visible impact on people and their communities and will support economic recovery. Moving away from a fragmented landscape with multiple funding streams, this new cross-departmental fund for England will invest in a broad range of high value local projects up to £20 million, or more by exception, including bypasses and other local road schemes, bus lanes, railway station upgrades, regenerating eyesores, upgrading town centres and community infrastructure, and local arts and culture. It will be open to all areas in England and prioritise bids to drive growth and regeneration in places in need, those facing particular challenges, and in areas that have received less government investment in recent years. This fund will attract funding for Scotland, Wales and Northern Ireland in the usual way.

Local roads

This Strategy, will transform the journeys people make every day. Local roads make up 98% of the network and are used in almost every journey. They are estimated to be worth £400 billion – one of the UK's most valuable public assets.[10] Well-maintained local roads allow for faster and more reliable journeys, boosting local businesses and serving all road users. High quality local roads are also central to the future of transport, playing an important role in the take-up of autonomous vehicles and greener forms of transport such as cycling and buses.

The Spending Review commits £1.125 billion of local roads maintenance funding in 2021-22, including £500 million for the Potholes Fund to fix potholes and resurface roads. **This will be supported by £260 million allocated to Local Authorities in 2021-22 for shovel-ready local transport schemes** through the Integrated Transport Block, including public transport and active travel upgrades.

The government is also investing £310 million in 2021-22 in upgrading the road network, reducing congestion and making it better able to cope with demand by adding capacity. This will support investment in over 50 schemes in this Parliament such as North Hykeham relief road and crossings in both Lake Lothing and Great Yarmouth due to start construction shortly. **Altogether, this means the government is investing £1.7 billion in local roads in 2021-22.**

Buses and active travel

Road-building alone cannot solve congestion: the UK also needs to use limited road space more efficiently. **This forms part of the government's broader agenda for driving improvements in local transport across the country through £5 billion for buses and cycling over this Parliament**. Increasing cycling and walking can help tackle some of the most challenging issues facing UK society: improving air quality, combatting climate change, improving health and wellbeing, addressing inequalities and tackling congestion on the roads. There has already been progress in this space – despite fewer people travelling overall during the pandemic, in the summer there was around a 100% increase in weekday cycling, and on some weekends the increase has been around 200%, compared to early March, prior to the lockdown.[11]

In May, the government announced a £2 billion active travel package in order to make it easier and safer for people to walk and cycle. This investment will support the delivery of the priorities set out in Gear Change, the government's new long-term walking and cycling strategy,[12] which will ensure high design standards, and help integrate new cycling infrastructure into cities, alongside other road users, with thousands of miles of safe, continuous and direct cycling routes. **This funding included £225 million in emergency funding in 2020-21 for local authorities to help them create cycle lanes and more space for pedestrians.**

Buses are the workhorses of public transport, accounting for over 50% of journeys.[13] Yet domestic bus use has been in decline, falling by over 10% since 2009-10 outside London.[14] The government is investing to build back better by supporting local authorities and operators to work together to coordinate timetables and ticketing to meet shifting patterns of demand, deliver bus priority measures that tackle congestion, and employ open data and demand-responsive technologies to improve the customer experience. **The Spending Review commits £300 million in 2021-22 to drive transformation, maintain essential services as long as necessary, and support the industry through the COVID-19 recovery.** This combination of measures will make trips smoother and faster than ever before.

Digital connectivity

The UK is a nation that thrives on digital connectivity, with some of the highest rates of digital adoption in the world. The UK has the fifth largest number of broadband and mobile subscriptions in the OECD,[15] and more people in the UK shop online than in any EU member state.[16] The government wants to deliver high quality, reliable digital infrastructure that works across the UK, so that mobile calls do not drop, video calls don't freeze, and people working from home can do their jobs and run their businesses with ease.

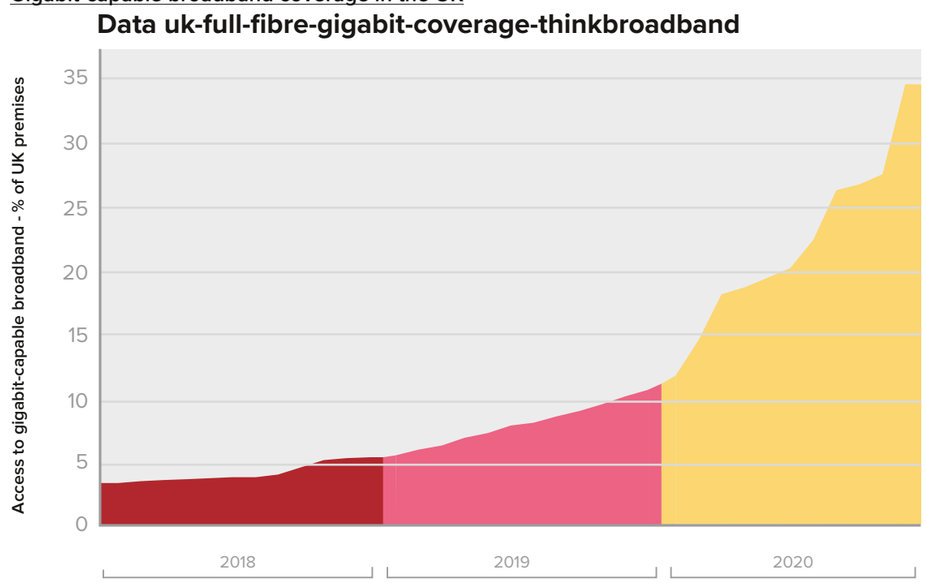
Fast, reliable digital connectivity can deliver economic, social and well-being benefits for the whole of the UK. Never has this been more important than as the country deals with the impact of COVID-19, when digital infrastructure has enabled home working, home learning, and kept families in touch with each other in extraordinary circumstances.

Digital infrastructure is particularly important for the UK's rural communities in all four nations. Greater connectivity can help rural businesses innovate, grow, and create jobs. In doing so, it can help rural areas attract and retain young people and families, supporting thriving rural societies.

Gigabit-capable broadband, such as full fibre, can provide speeds of over 1,000Mbps, over forty times faster than standard superfast broadband and fast enough to download an HD film in seconds. These speeds provide new opportunities across the UK, for consumers and businesses alike, and enable 5G technology.

The government's programme for gigabit-capable broadband has made dramatic progress. More than a third of UK premises now have access to gigabit-capable connections, up from 9% when the government took office in July 2019. By next year, more than half of all premises will have access. During the COVID-19 pandemic, operators have rightly focused on network resilience at a time of unprecedented need for good connectivity. The government has also announced restrictions on the use of Huawei equipment. The government is working with industry to target a minimum of 85% gigabit capable coverage by 2025, but will seek to accelerate roll-out further to get as close to 100% as possible. The government will continue to implement an ambitious programme of work to remove barriers to broadband deployment and maximise coverage in the hardest to reach areas of the country.

Gigabit-capable broadband coverage in the UK

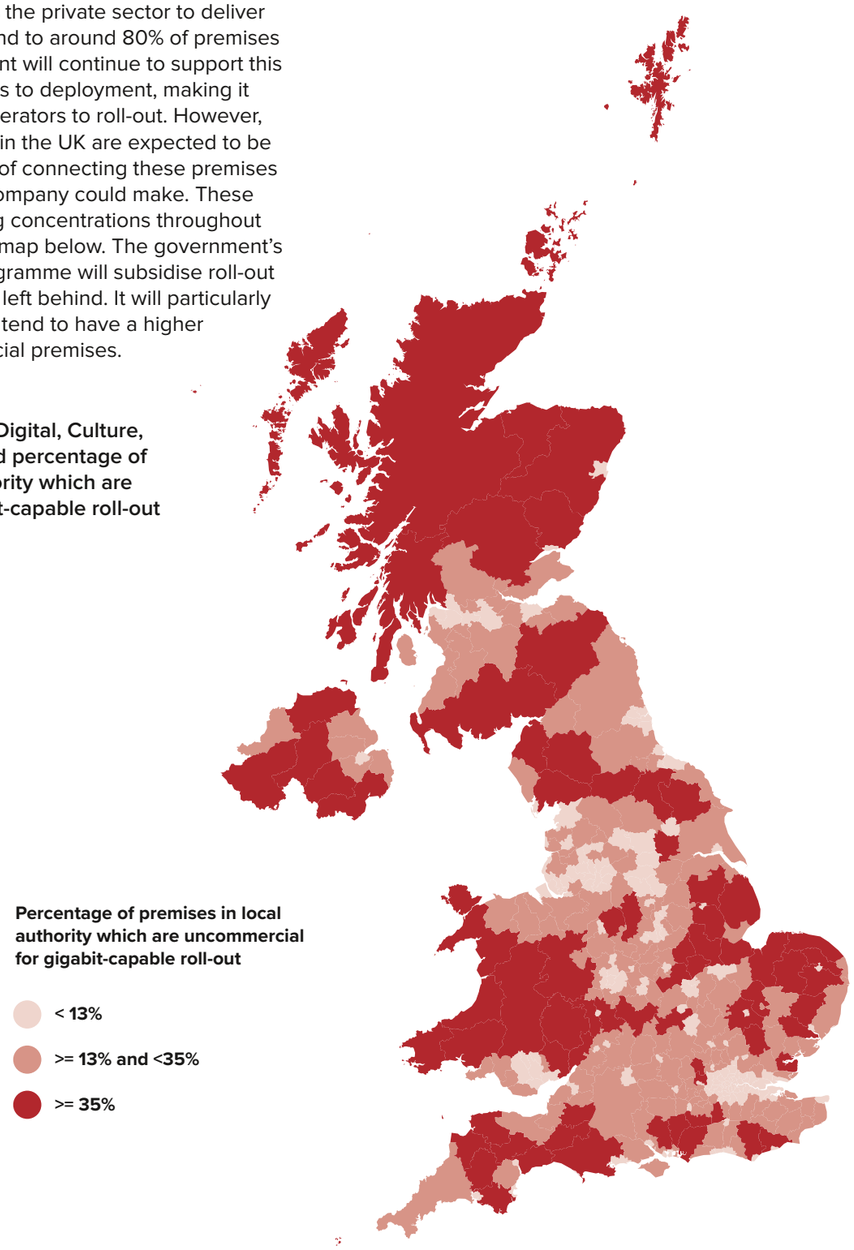


Source: Graph compiled using UK gigabit coverage data from thinkbroadband. UK gigabit coverage defined as percentage of UK premises with access to FTTP and/or DOCSIS 3.1. Data as of 10 November 2020.

The strategy for UK-wide gigabit-capable broadband

The government expects the private sector to deliver gigabit-capable broadband to around 80% of premises in the UK. The government will continue to support this through removing barriers to deployment, making it quicker and easier for operators to roll-out. However, around 20% of premises in the UK are expected to be uncommercial: the costs of connecting these premises outweigh the returns a company could make. These premises occur in varying concentrations throughout the UK, as shown by the map below. The government's £5 billion UK Gigabit Programme will subsidise roll-out to ensure no area will be left behind. It will particularly benefit rural areas which tend to have a higher proportion of uncommercial premises.

Source: Department for Digital, Culture, Media & Sport. Estimated percentage of premises in a local authority which are uncommercial for gigabit-capable roll-out



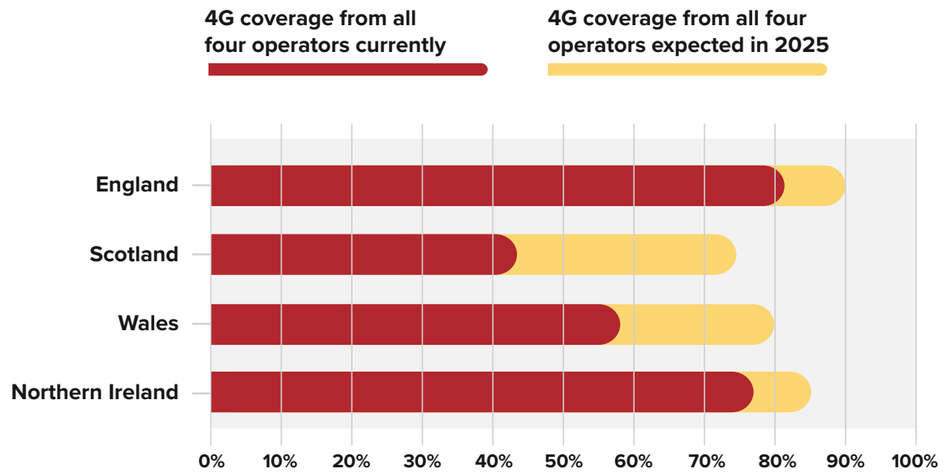
UK-wide roll-out is a major civil engineering project, requiring enough cabling to go around the Earth more than ten times.[17] The total level of investment required is in the region of £30 billion. Through the government's ambitious strategy, rapid increases in the rate of digital infrastructure deployment are already being seen and the UK is expected to see record speeds of deployment in the coming years. Current market data suggests that operators are on track to deliver new full fibre coverage to 2.5 million premises in 2020, up from around 750,000 in 2018.[18] The government expects this build rate to increase even further, creating thousands of new jobs.

Mobile connectivity is also crucial to allowing people to stay connected on the move. That is why **the government is investing £500 million, matched by industry, to deliver high-quality 4G mobile coverage from at least one operator across 95% of the UK by 2025,** through the Shared Rural Network. Through this ground-breaking partnership between government and industry, each operator has individually committed to reach 90% of the UK's landmass by 2026, and collectively the Shared Rural Network will provide additional coverage to 280,000 premises and 16,000 kilometres of roads by 2026. This will have major benefits in rural areas, and for Scotland, Wales and Northern Ireland nations in particular.

The Shared Rural Network will not only improve coverage, but also increase consumer choice. Currently, only 67% of the UK has good quality coverage from all four operators, and that will improve to 84% by the end of the programme.[19] This will mean far fewer people in rural areas will find themselves locked-in to the only mobile network with good coverage of their area.

The government will continue its pioneering 5G Testbeds and Trials Programme, with £50 million in 2021-22 to support demonstration projects across rural, urban and industrial settings. These projects show the exciting potential for 5G to transform the lives of consumers and businesses, and are a key part of ensuring the benefits of 5G can be felt in every nation of the UK by the mid-2020s.

It is also vital that digital infrastructure networks are secure and resilient. That is why the government is introducing the Telecommunications (Security) Bill which sets out a new regulatory regime for telecoms security. **The government will also publish the 5G Supply Chain Diversification Strategy to ensure the UK's 5G networks are not over reliant on a single supplier, committing £250 million to start this journey.** The strategy will set out a clear and ambitious plan to grow the telecoms supply chain and ensure it is resilient to future trends, to shape global standards, and to make significant investments in research and development to bring through new technology. The government will seek the advice of the Telecoms Diversification Task Force in developing specific programmes under this strategy.



Source: Ofcom 2020 Summer Update Connected Nations

Flooding

Expanding economic opportunity means little for a place – and the people who live and work there – if the infrastructure supporting it is not resilient to potential hazards. Many rural communities and economies across the UK have experienced the devastating impacts of flooding, which can cause significant damage to homes and businesses lasting much longer than the floods themselves. The government is committed to harnessing the opportunities of rural landscapes to increase the resilience of rural communities to flooding. **The government will do this by maximising good land management and implementing nature-based solutions through the next £5.2 billion flood and coastal defence programme starting in 2021**, a doubling of the current programme. Further details are set out in Chapter 3.

Boosting the UK's cities and towns

The government recognises that different places across the UK have different challenges:

- **Regional cities** are not as productive or as connected, as they should be. The government's long-term ambition is for UK cities to be globally competitive. The government will support them to improve their productivity through strengthened infrastructure; and
- **Many towns have lost out from structural changes** – facing economic and social deprivation. The government's long-term ambition is for every town to be an excellent place to live and work – offering opportunity to those who live there. The government will drive the regeneration of towns, including through investing in infrastructure.

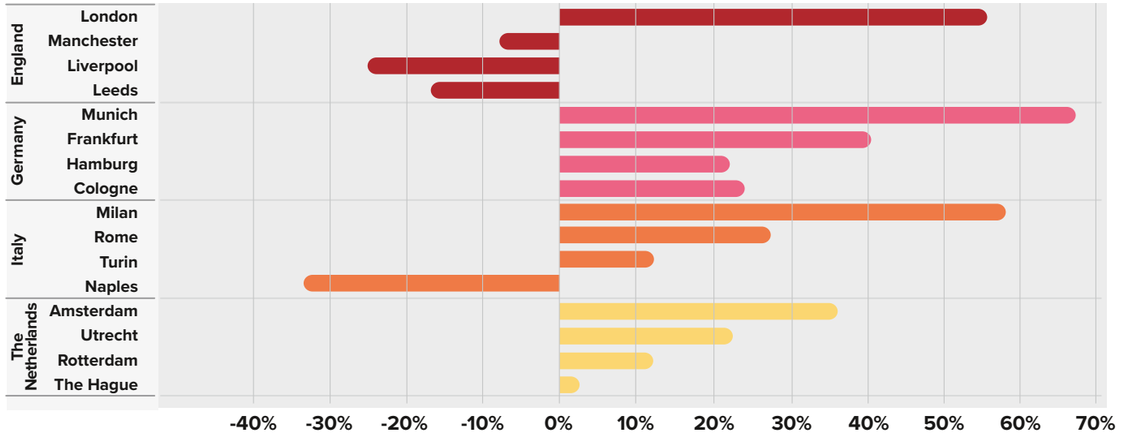
Making cities the engines of future growth

The government shares the National Infrastructure Commission's (NIC's) view on the importance of strong regional cities; the vital organs of the UK economy. Cities drive economic growth through agglomeration effects; they encourage specialisation, drive competition and spread ideas and innovation faster than other places. London is one of the most productive cities in the world, and many other UK regional cities can also play a similarly important role in the UK economy.

However, the NIC noted that many of the UK's largest cities have below average productivity relative to their size and population, in part due to high congestion and poor local transport links. They are not producing agglomeration economies to the degree that they could. This in turn has an impact on the success of nearby towns, as strong cities can act as an anchor for growth across a wider region.

A well-designed public-transport network is fundamental to the operation of any city. London is the only city in Europe where you can access more local services by public transport than by car.[20] But the story is different in regional cities, where access to those same services by public transport lags behind continental peers. **This is why the government will invest in the North, Midlands and South West to help rebalance the UK economy, and devolved administrations will receive funding to enable public transport investment in Scotland, Wales and Northern Ireland.** Levelling up the rest of the UK does not mean levelling London down. The government is continuing to address capacity issues in the capital, by financing the completion of Crossrail, but has agreed that Transport for London will stop development on Crossrail 2. This frees up investment to raise the performance of public transport networks in the regional cities towards London's gold standard.

Productivity in selected major cities in England and comparable countries.
Calculated using GDP per capita in the metropolitan area as share of the national value



Source: National Infrastructure Commission calculations using OECD Statistics. Functional Urban Areas and National level, 2018 (except France where latest urban productivity data is 2016). Productivity in English cities has been calculated as a percentage of the UK average

The government agrees with the NIC that long-term and locally led investment in large cities' transport networks is critical to driving future economic growth and competitiveness. This is central to the government's ambition of levelling up the UK.

The Transforming Cities Fund was launched at Autumn Budget 2017 to improve public transport, boost connectivity and reduce congestion through packages of interlinked schemes such as light rail, new bus corridors, cycling and walking infrastructure. The government has now allocated nine city regions a share of over £1.2 billion for a range of shovel-ready public and sustainable transport schemes – in addition to the over £1 billion already devolved to six Mayoral Combined Authorities. In line with the NIC recommendation, this will drive up productivity and spread prosperity through investment in public transport in MCAs.

Alongside the Transforming Cities Fund and a share of the £5 billion announced for buses and cycling over this Parliament, **eight City regions will also benefit from £4.2 billion government investment in five-year funding settlements for local transport starting in 2022-23,** and £50 million in 21/22 to support preparations for settlements. Following the approach that has worked for London, these settlements will be agreed with elected Mayors and published, providing transparency and accountability while giving Mayors the flexibility and certainty to deliver their plans. The city regions that will receive settlements, subject to appropriate governance, include Greater Manchester, Liverpool City Region, West Midlands, West Yorkshire, Sheffield City Region, Tyne and Wear, West of England and Tees Valley. This will deliver the NIC's recommendation to provide settlements that enable long-term and locally-led investment in large cities transport networks, devolving decisions on local transport to those that understand those systems best.

Transport needs to work hand in glove with skills, education, housing, culture and environment policies to deliver the step change in quality of life and economic performance the government wants to see. Alongside transport, the government is therefore taking steps to improve local infrastructure more broadly, working in conjunction with local areas to ensure investment is in line with local priorities. The government has agreed City and Growth Deals across the UK, to provide local areas with the powers and funding they need to drive forward local economic priorities. The government is investing in Scotland, Wales and Northern Ireland's cities, towns and rural areas through City and Growth Deals. There are 20 City and Growth Deals in Scotland, Wales and Northern Ireland either agreed or in negotiation, committing almost £3 billion of UK Government investment. This means every part of Scotland, Wales and Northern Ireland is supported by a City and Growth deal.

The government also continues to support pan-regional partnerships; the Northern Powerhouse, Midlands Engine, Western Gateway - and recognises the role they play in championing investment and opportunity in their geographies.

Spending Review 2020 also confirms that, in addition to the Brownfield Housing Fund announced at March Budget 2020 for Mayoral Combined Authorities to unlock up to 26,000 high quality homes, **the government will provide an additional £100 million in 21/22 to support housing delivery and regeneration**, including unlocking brownfield sites, regenerating estates and releasing serviced plots on public sector land.

These plans form part of the £7.1 billion National Home Building Fund which will help deliver up to 860,000 homes across the country, in large part through investment in infrastructure to unlock housing – including roads, community facilities and utilities. This will ensure that more homes mean better, not more stretched, local infrastructure and community facilities.

Regenerating towns and communities

Towns in the UK are hubs of economic activity and provide homes to the majority of the population in the UK. While some towns have prospered, either in their own right or through their links to growing cities, many struggling towns do not always have the fundamental building blocks for a strong local economy in place.

Some towns face specific disadvantages that reduce growth and productivity. This can be a mix of economic deprivation, characterised by high concentrations of low-skilled workers, social deprivation, poor employment and low health outcomes. This can be exacerbated by poor transport and digital connectivity. Places that face these challenges need targeted support to help boost their local economies, support local leadership and maximise their potential.

The government will, therefore, invest in infrastructure to support economic regeneration and create new employment opportunities in the towns across the UK which are most in need, to make them excellent places to live and work.

Through the Towns Fund, the government is galvanising the local economies of over 100 struggling towns across England to support their long-term economic and social regeneration as well as their immediate recovery from the impacts of COVID-19. The first seven Town Deals were agreed in October 2020. Further successful towns will be announced over the coming months.

The government is taking steps through national programmes to support local economies, in towns across the UK. **Through its ambitious Freeports programme the UK government will bring jobs, investment and prosperity to some of the most deprived communities across the four nations of the UK.** Freeports will enjoy a combination of tariff benefits, tax incentives, and regeneration funding. The programme aims to establish Freeports as national hubs for global trade and investment across the UK, promote regeneration and job creation, and create hotbeds for innovation. A minimum of 10 Freeports will be delivered. Successful bidders will be announced in Spring 2021 and the first Freeports will be designated in late 2021.

Supporting jobs and growth across the UK, in particular in post-industrial and coastal towns, the government's decarbonisation agenda will build the UK's capability in new green industries. Infrastructure investment in offshore wind capacity (40GW by 2030) and port infrastructure will create jobs in coastal communities. Further investment in in Carbon Capture and Storage and in low carbon hydrogen will drive economic activity in post-industrial towns.

Infrastructure investment across the UK

Where policy is reserved for the UK government – for example digital infrastructure – it is taking action to improve infrastructure across the whole of the UK. Where policy is devolved – for example substantial areas of transport – the UK government allocates funding to the devolved administrations through the Barnett formula.

The map shows how investment by the UK government in a number of local infrastructure programmes will benefit different regions.

In addition, **the government is making key transport investments in England, including:**

1 North East

- **Tyne and Wear** and **Tees Valley** will benefit from intra-city transport settlements starting from 22/23.
- Providing £209m to the North East including £16m to redevelop **Sunderland** Central Station.

2 North West

- **Greater Manchester** and **Liverpool** City Region will benefit from intra-city transport settlements starting from 22/23.
- Providing £40m to **Preston** City Region including funding for a next generation Urban Traffic Management and Control system.
- Providing an additional £146m to halve the construction time of dualling the A66 across the Pennines.

3 Yorkshire and Humber

- **Sheffield** and **Leeds** City Regions will benefit from intra-city transport settlements starting from 22/23.
- Providing £319m to **West Yorkshire Combined Authority** including £30m for active and sustainable travel across **Bradford**, and £171m to **Sheffield** City Region including for a new bus rapid transit link.
- Developing schemes including the A1 from **Doncaster** to **Darrington**.

4 West Midlands

- **West Midlands** Combined Authority will benefit from intra-city transport settlements starting from 22/23.
- The Transforming Cities Fund provides £321m to **West Midlands** Combined Authority to invest in public transport schemes.
- Upgrading the A46 Coventry Junctions.

5 East Midlands

- Providing £169m to **Derby & Nottingham** including £25m for bus rapid transit in Derby, and £40m to **Leicester**.
- Progressing the North Hykeham Relief Road in **Lincolnshire.**

6 East of England

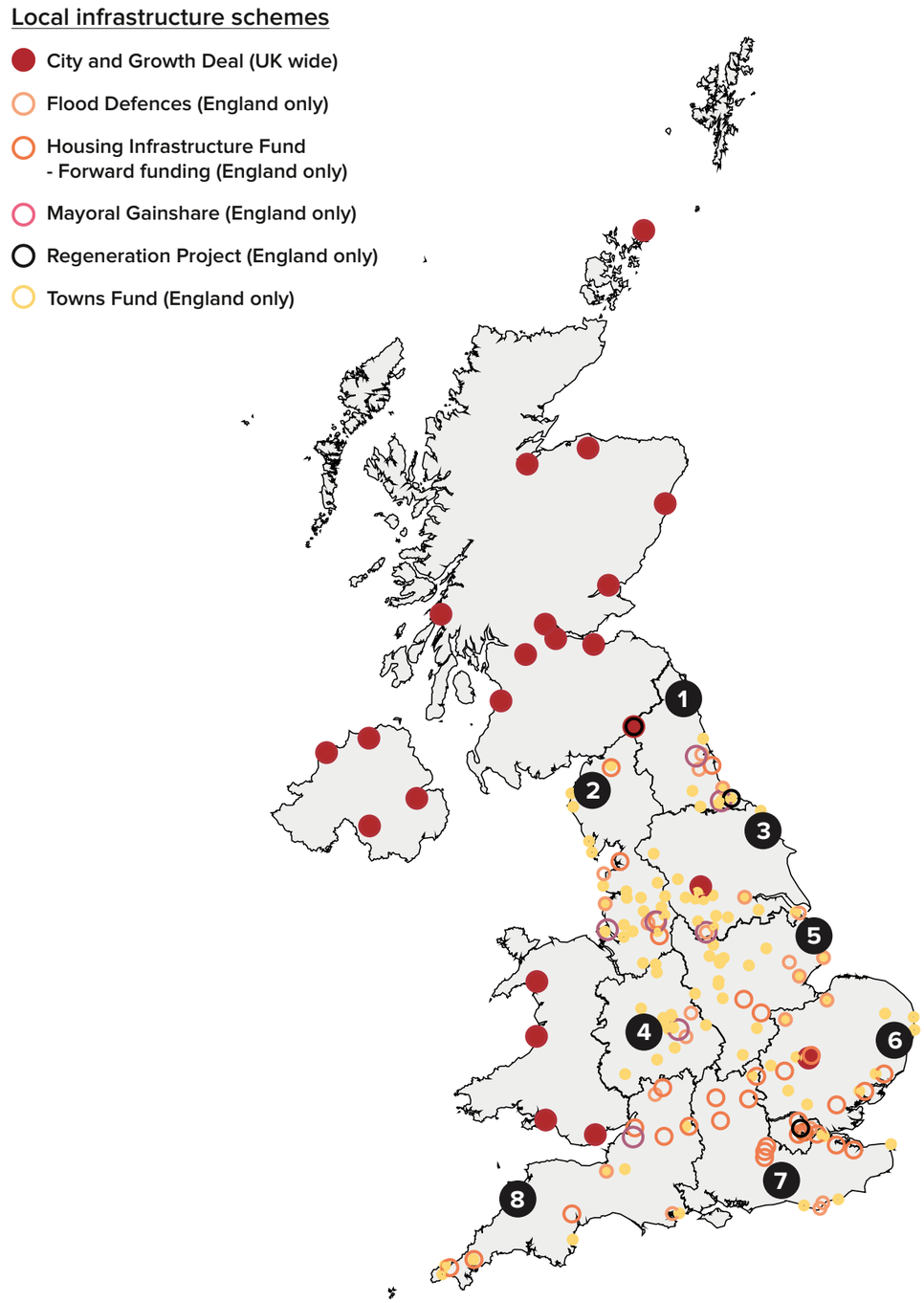
- Providing £39m to **Norwich** including a mobility hub at Norwich station, and £95m to **Cambridgeshire** and **Peterborough** to invest in public transport schemes.
- Building the Great Yarmouth Third River Crossing in **Norfolk** and Lake Lothing Third Crossing in **Suffolk**.

7 London & South East

- Providing £60m to **Portsmouth** and **South East Hampshire** including the relocation of Gosport bus station and taxi rank, and £63m to **Southampton** including new rapid bus links.
- Investing in the Lower Thames Crossing and financing the completion of Crossrail.

8 South West

- The **West of England** Combined Authority will benefit from intra-city transport settlements starting from 22/23.
- Providing £59m to **Plymouth** including £12m to improve walking and cycling, and £79m to **Bournemouth, Christchurch & Poole**.
- Investing in the A303 Stonehenge scheme, and in MetroWest to improve rail services across **Bristol** and the surrounding region.



Connecting nations and regions

HS2 is this government's flagship national transport project, forming the spine of the UK's transport network by delivering essential North-South connectivity between some of the UK's biggest and most productive cities. High-speed rail does not just affect those who ride it, but also releases capacity on the classic rail network, meaning better local train connections into the UK's great cities. Construction for Phase 1 from London to the West Midlands started earlier in 2020, and the Hybrid Bill for Phase 2a from the West Midlands to Crewe is expected to receive Royal Assent later this year.

This government is committed to building back better. In line with the recommendations of Douglas Oakervee's review, **the government has strengthened HS2 governance, including through a new ministerial taskforce.** This is providing greater oversight and control of delivery performance, ensuring that HS2 will be delivered on time and on budget, and supporting realisation of the benefits of the scheme.

Through the Union Connectivity Review announced by the Prime Minister the government will bring its four great nations closer together by assessing options to improve transport links. The review will be chaired by Sir Peter Hendy and report by summer 2021. It will involve extensive consultation with the devolved administrations and consider the quality and reliability of existing connections; long-term trends in demand and technological developments; the environmental impact of both the existing and proposed transport links; and how connectivity can support economic growth as the UK recovers from COVID-19. The report will provide recommendations on whether and how best to improve connections, and whether that should include additional infrastructure investment by the UK government.

The government will also revitalise the arteries as well as the spine of the country's transport network, recognising that regional, as well as national, connectivity is vital to uniting the UK. **The government will make the largest ever investment in England's strategic roads - £27.5 billion over this Parliament, a 60% increase on spending in the last five years.** This major investment will ensure that these national traffic corridors are well designed, delivered, maintained, and continue to serve all road users into the future.

New upgrades will include: dualling the A66 between Penrith and Scotch Corner and halving the construction time as part of Project Speed; upgrading the A46 Newark bypass in the East Midlands; building a new Lower Thames Crossing; and building a two-mile tunnel on the A303 at Stonehenge to speed up journeys and enhance the World Heritage Site. The second Road Investment Strategy is focussed not just on road users, but on fulfilling the government's obligations to communities living close to major routes and towards the natural, built and historic environments. All of this money will generate Barnett payments to the Scottish Government, Welsh Government and Northern Ireland Executive, so that they can follow suit.

The railways helped to build modern Britain, so as well as building HS2, the government is also boosting the classic rail network. **Over the remainder of Network Rail's 5 year settlement – Control Period 6 – the government will invest £17.5 billion to renew and upgrade the railway system, improving passenger journeys across the UK**. This will deliver on the NIC's recommendations by progressing the East West Railway.

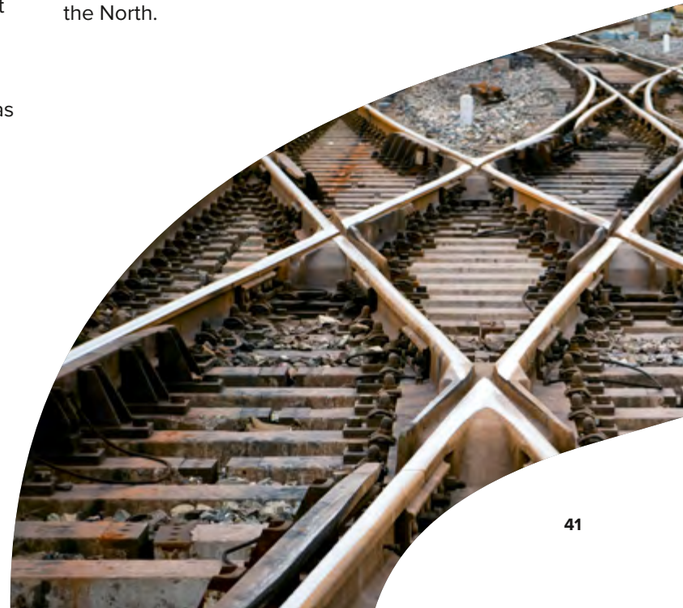
In 2017, the National Infrastructure Commission outlined the transformational economic potential of the Oxford-Cambridge Arc in its report 'Partnering for Prosperity'. At Spending Review 2020 the government has reaffirmed its commitment to the area, including additional funding to support the Budget 2020 commitments to develop a Spatial Framework to plan for long-term economic and housing growth and to explore the case for up to four Development Corporations along the route of East West Rail. This will help to deliver sustainable economic and housing growth, supported by infrastructure, that meets the needs of local people.

The government will also deliver on its manifesto commitment to spend £500 million to restore transport services previously lost in the Beeching cuts of the 1960s, including reopening the Ashington-Blyth line in Northumberland to passenger services, and restoring rail links to Okehampton in Devon. The government has also launched a New Ideas Fund to pay for feasibility work on proposals for new lines and stations.

Feasibility funding for the first ten schemes has been announced, which will provide a basis for decisions on further development: re-opening Meir Station in Stoke-on-Trent; the Barrow Hill line between Sheffield and Chesterfield; the Ivanhoe line between Leicester and Burton on Trent; branch lines on the Isle of Wight (Shanklin-Ventnor and Wootton-Newport); the Abbey line between St Albans Abbey and Watford Junction; Reopening Wellington and Cullompton railway stations; Bury-Heywood-Rochdale lines; Clitheroe to Hellifield railway line; reinstatement of rail access to Devizes via a new railway station at Lydeway; and the Waterside line (Hythe-Totton).The government will provide further feasibility funding for an additional fifteen proposals to inform decisions on further development: reopening Beeston Castle and Tarporley station in Cheshire, St. Anne's Park station in Bristol, and Ferryhill station in County Durham; reinstating links between Bolton, Radcliffe, and Bury; the Stratford-upon-Avon to Honeybourne/Worcester/Oxford line; new stations at Waverley in South Yorkshire and a station in the Langport/Somerton area of Somerset; improved services from Melton Mowbray and Falmouth; upgrading the South Fylde Line; the Maid Marian line between Nottinghamshire and Derbyshire; reinstating rail access to Cirencester; restoring services between Swanage and Wareham; the South Humber rail link; and a new link between Consett and Newcastle.

The government is also expanding the third round of the New Stations Fund to £32 million. This will fund the opening of railway stations at Edginswell and Thanet Parkway in Kent; and St Clears in Carmarthenshire. It will also provide funding to further develop proposals for stations at Haxby in York and Deeside in Flintshire.

The government is fully committed to improving connectivity between northern cities. Over the course of this year, the government has been drawing up an Integrated Rail Plan for the Midlands and the North of England, which will be published shortly. In line with the terms of reference, the Plan will ensure that Phase 2b of HS2, Northern Powerhouse Rail and other planned rail investments in the North and Midlands are scoped and delivered in an integrated way. This will bring transformational rail improvements more quickly and to more places, and will be informed by the NIC's assessment of the rail needs of the Midlands and the North.



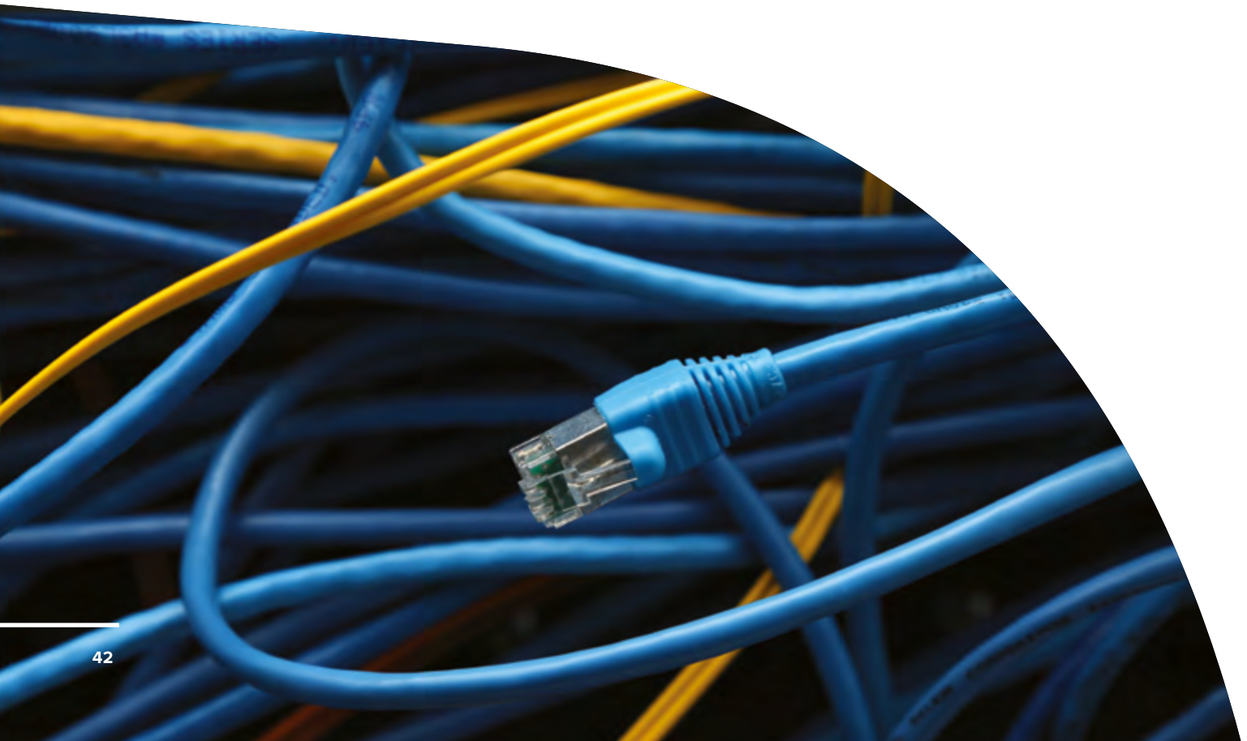
Connectivity for a trading nation

International connectivity is important for linking businesses to valuable markets, and to support trade and investment.[21] The UK has the third largest aviation network in the world. Flights into UK hub airports connect the regions and nations of the UK to the world, enabling a more global Britain. Air connectivity also brings together the nations of the UK, and in 2019 over 19 million passengers flew on routes between England, Scotland, Wales and Northern Ireland.[22]

The government last month launched the Global Travel Taskforce to consider how the international travel sector could be supported through the specific challenges caused by the COVID-19 pandemic. It has since considered what steps we can take to facilitate business and tourist travel on a bilateral and global basis, through innovative testing models and other non-testing means, and more broadly what steps we can take to increase consumer confidence and reduce the barriers to a safe and sustainable recovery of international travel. This is alongside the already unprecedented package of measures announced by the Chancellor and available to the travel sector, including schemes to raise capital, flexibilities with tax bills and the extended furlough scheme.

The UK's freight system is one of the most efficient in the world, providing seamless transportation of goods into, out of and across the country, boosting economic growth. The government has announced that it will provide a full response to the NIC's *Better Delivery: The Challenge for Freight* report through the publication of a comprehensive cross-modal freight strategy in 2021. This will also consider the impacts on the freight system of the end of the transition period and the COVID-19 pandemic.

In preparation for the end of the transition period, the government has provided critical support to key ports around the UK through their surrounding Local Resilience Forums to mitigate any potential disruption and ensure continued seamless transit of freight in and out of the county. This has included development and implementation of essential traffic management plans, particularly around the Port of Dover and the Channel Tunnel, as well as upstream intervention to support and improve haulier preparedness ahead of the end of the Transition Period. The government has also allocated £200 million towards the Port Infrastructure Fund to ensure that ports across the UK have the necessary infrastructure in place for freight to continue to flow smoothly in and out of the UK.



Doing things differently

The government is taking steps to reform how it invests in places, as well as what it invests in, to embed long-term change in policy making to level up and unleash the potential of the Union.

Major policy interventions will be considered UK-wide. The UK Internal Market (UKIM) Bill changes the government's powers to act in Scotland, Wales, and Northern Ireland. If passed, the UK Government will have concurrent powers to invest in infrastructure and economic development.

The government supports English devolution to strengthen local institutional structures and bring decision-making closer to the places impacted by those decisions. Nearly 40% of people in England now live in an area where devolution has transferred powers and funding from Whitehall to a directly-elected city region mayor.[23] The government will set out expanded devolution arrangements in the English Devolution and Local Recovery White Paper, building on the success of the directly-elected mayors who are driving economic growth across their functional economic areas, by ensuring mayors have the powers and responsibilities they need to shape their local area.

The government is also taking steps to ensure national policy making is sensitive to local needs. Through the government's Places for Growth programme, 22,000 civil service roles will be relocated from Whitehall by 2030 to address the regional imbalance in the civil service. The new National Infrastructure Bank will also be based in the north of England. In addition, the UK government will invest £210 million in 2021-22 in the Places for Growth and Government Property Agency hubs programmes, establishing more UK government hubs around the UK, enabling departments to further relocate out of London The government will deliver on its commitment at *Budget 2020* for an economic campus in the North of England.

To ensure the impact of policies on places is taken into account when choices are made, the government conducted a review into its guidance on appraising proposals regarding government spending, taxation and regulations (*the Green Book*). This will better link policies to government objectives, including levelling up.

The Green Book Review

As announced at Budget 2020, the government has undertaken a review of the Green Book, to ensure that investment spreads opportunity across the UK. The Green Book is the government's guidance on best-practice appraisal and is therefore a vital tool for ensuring value for money for taxpayers.

A central finding of the review is that the appraisal process often fails to properly consider how a proposal will deliver the government's policy ambitions, including levelling up. This leads to appraisals being focused on a benefit cost ratio (BCR) that does not reflect social policy objectives or give ministers the information they need about where costs and benefits fall.

HM Treasury has therefore updated the Green Book to end the dominance of the BCR is decision making, starting with this Spending Review. Appraisals must give a comprehensive picture of cost and benefits, including non-monetisable, non-economic impacts. In particular, options will be assessed first and foremost on whether they deliver relevant policy objectives (for instance, the regeneration of a particular place). Any option which fails to do so cannot be considered value for money and will not progress to shortlisting stage.

The government is also changing the guidance so it will no longer be acceptable for proposals to be 'place blind'. Business cases should be developed to align with relevant local strategies and major interventions in the area. And for the first time, business cases for all proposals will have to set out how they will impact different places on a comply or explain basis.

These changes will be crucial to levelling up. They will mean that appraisals and advice to ministers should include much better analysis on how options deliver their policy goals, as well as which parts of the country look to gain most from them, supporting better-informed decisions.

These updates will feed into future Spending Reviews and HM Treasury will also roll out a tailored programme of training across Whitehall and beyond to ensure that the new Green Book guidance is fully embedded in future appraisals.

Decarbonising the economy and adapting to climate change

At a glance

As set out in the Prime Minister's *Ten Point Plan for a Green Industrial Revolution*, **infrastructure investment is fundamental to delivering net zero emissions by 2050**. The government will unlock private sector investment to accelerate the deployment of existing technology, such as retrofitting the UK's building stock and electrification of vehicles, while advancing newer technologies such as carbon capture and low-carbon hydrogen. **The government's approach will create jobs to support the recovery from COVID-19, and support the government's levelling up agenda by ensuring key industrial areas are at the heart of the transition to net zero**. The UK is already decarbonising faster than any other G20 country.[24] As hosts of the UN Climate Change Conference COP 26 next year, the UK will go even further to promote the importance of low-carbon infrastructure and support its commitment to the Paris Agreement.

Key measures include:

- Making significant investment in offshore wind and modern ports and manufacturing infrastructure to expand the share of generation from renewables;
- Providing up to £525 million to bring forward both large-scale nuclear and invest in the development of advanced nuclear technologies;
- £1 billion to support the establishment of carbon capture and storage in four industrial clusters;
- Investing £1.3 billion in charging infrastructure to accelerate the mass adoption of electric vehicles (EVs) ahead of ending the sale of new petrol and diesel cars by 2030;
- Promoting private investment and setting an enduring regulatory environment to promote energy efficiency;
- Enabling heat decarbonisation by supporting the roll-out of existing technologies like heat pumps and development of emerging technologies like hydrogen;
- Funding to help England to meet its share of the Climate Change Committee's recommendations to plant 30,000 hectares of trees a year in the UK; and
- Investing £5.2 billion by 2027 to better protect 336,000 properties and boost resilience of communities to the increased risk of flooding and coastal erosion resulting from climate change

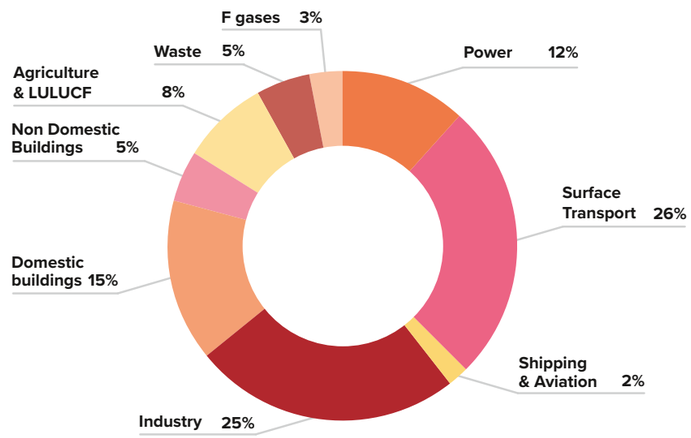
In June 2019 the UK became the first major economy in the world to legislate to end its contribution to global warming by 2050, in line with the UK's commitment to global climate action under the Paris Agreement.

The UK's commitment to achieving net zero emissions by 2050 will require profound changes that will provide huge opportunities for the UK to build back better from COVID-19. The UK will need strong, consistent and deliberate policy action to support the technologies that will reduce emissions.[25]

These changes will be economy-wide, and HM Treasury is currently undertaking a review into how the transition could be funded and where the costs could fall. An interim report will be published shortly and the final report in spring 2021.

The majority (over 80%) of the UK's emissions come from infrastructure sectors, and so action on infrastructure will be crucial for meeting the UK's Carbon Budgets and continuing progress towards the net zero target.[26]

UK production emissions by sector (2019)



Source: Department for Business, Energy & Industrial Strategy provisional UK emissions 2019, on a by source basis - mapped to Climate Change Committee sectors

The UK has already made considerable progress, reducing emissions by 45% since 1990 while growing the economy by almost 80% (as of 2019).[27] This has been achieved while minimising costs, causing a net reduction in household bills.[28]

The majority of contributions and investment so far has come from the power sector, where emissions have fallen almost 70% since 2008.[29] This has been driven through coordinated action by the private sector working closely with the government: regulated efficiency measures have reduced electricity consumption by 14%;[30] coal power generation has fallen from 30% to below 1% since 2014,[31] and the price of off-shore wind has fallen by 55%.[32]

To go further, the UK will need to improve other aspects of its infrastructure in a way that more visibly alters people's lives, including how people heat their homes and travel around the country. **This Strategy sets out early actions that the government will take to build the infrastructure needed to achieve net zero, improve air quality, create a greener urban environment, and minimise the impact of flooding**. This includes significant progress on: carbon capture and storage, low-carbon hydrogen production, charging infrastructure for electric vehicles, offshore wind, and energy performance improvements in buildings.

In many cases the solutions needed are known and action needs to be taken immediately. Further progress will be made by accelerating the deployment of existing technology in the near-term, such as increasing wind generation or driving retrofit in the UK's building stock. These tasks will enable rapidly growing industries, creating jobs across the economy and boosting productivity.

For other areas, **new technologies and skills will need to be developed to continue decarbonising**. Since 2016, the government has made historic increases to public support for science. The UK's world-class institutions are already amplifying this scientific progress through curiosity-driven research and support for technologies. Looking ahead, the government will need to build on these strengths to drive both the development and deployment of new technologies, including:

- Low carbon hydrogen as a potential alternative to fossil fuel heating in industry and buildings, to store energy, a source of power, and for some modes of transport;
- Carbon Capture and Storage to remove up to 90% of the carbon dioxide emissions from gas-fired power stations and industrial factories, including those making hydrogen, as well as to support greenhouse gas removal technologies to offset some emissions from the hardest to decarbonise sectors;
- Technologies to remove carbon dioxide from the air, using 'direct air capture' or biomass, so that it can be used as an input to other processes, or stored; and
- Floating offshore wind to allow the harnessing of wind power across a greater proportion of the seabed.

Investment in these areas, where the UK has competitive advantage, can create the knowledge and skills needed for a green industrial revolution, driving leadership in the industries of the future, reducing national and global emissions, as well as providing the platform for significant economic growth. Where these investments are brought together to create place-based industrial clusters they can transform local economies, creating productive jobs, developing specialist skillsets, and attracting private investment. For example, the North East of England could become a home of choice for companies delivering carbon capture and storage; making hydrogen power a part of daily life; and designing, building and maintaining offshore wind turbines.

At the same time, **the country must adapt to the risks posed by climate change**. National infrastructure will be made resilient to future climate change by ensuring that its expected effects are fully considered at the design stage. This means addressing the likely impacts of higher temperatures, more extreme weather, and increased incidence of droughts, floods, and disease, and building in cost-effective mitigations over the whole life cycle of the asset now

The government's approach

Reducing emissions across whole sectors of the economy must be done in a sustainable way that minimises cost. The benefits, opportunities and costs need to be shared across society and the economy must grow to enable the transition to be sustained, particularly as it recovers from the COVID-19 pandemic. **In November 2020, the Prime Minister laid out his *Ten Point Plan for a Green Industrial Revolution*. This strategy sets out how it will be delivered.**

The government cannot tackle this challenge alone. **Instead, the government will look to work closely with investors, industry and households**. This strategy sets out clear objectives and ambitions, to provide policy and regulatory certainty for project sponsors and investors to harness the transformational benefits that can be delivered by long-term private capital investment. The energy transition will be underpinned by harnessing private investment and innovation as new technologies become available, new markets are established and opportunities are created across the economy.

However, the full suite of policy levers will need to be deployed to encourage this private sector investment and create the appropriate market incentives to encourage competition and drive down costs, and to ensure that decarbonisation is achieved at the best possible value for money, with the right distributional balance of costs across consumers, taxpayers and the private sector.

In the short-term, public financing will help to overcome barriers to investment in new technologies and ensure the costs are borne fairly across society, for example:

- By using the government's unique position to support those risks where the private sector simply cannot, including in the development of financing and delivery models for complex and novel major infrastructure;
- By supporting trade exposed industries at risk of offshoring due to higher operational costs associated with decarbonisation technologies;
- By investing in fuel poor households and social housing to reduce bills for the poorest in society and protect the less able to pay; and
- By supporting the transition from R&D to deployment, driving forward innovation and encouraging UK companies to stay at the cutting edge.

Now and in the longer term, creating the right regulation and tax measures will be imperative in driving competition and opening up new markets. This will influence behaviour to address market failures, with a view to any government subsidies reducing over time as risks which once could not be borne by the private sector are mitigated. The Net Zero Review will analyse the range of choices for how households, businesses and the taxpayer could contribute towards the transition and evaluate the trade-offs between cost, competitiveness, effects on consumers and impacts on the taxpayer.

This chapter sets out the government's progress on this vision to date, across low carbon energy, industry, transport, buildings, resilience to climate change, and developing new and innovative technologies, as well as the strategy for moving forward.

Power

The decarbonisation of the power sector is a major success story from the past decade. It accounted for just 12% of emissions in 2019, down from 27% in 2008, mainly due to the growth of renewables and reductions in the use of coal in power stations.[33] Throughout this period, private investment has also underpinned substantial progress in reducing the cost of clean electricity and maintaining secure supplies.

The steady increase in renewable investments has been driven through a number of successful subsidy schemes and market reforms. Competitive auctions through the Contracts for Difference scheme have led to a dramatic reduction in the costs of offshore wind from £120/MWh in the first auction in 2015 to just £40/MWh in 2019.

While the total cost to consumers from low carbon levies has been significant, rising to around £10 billion a year in 2020, these have secured significant reductions in the cost of clean electricity and also put downward pressure on wholesale prices. Further deployment of renewables can be done in a more sustainable fashion without significantly higher costs to consumers.

Progress on decarbonisation in the power sector has also been driven by a consistent carbon price signal that has reduced the UK's reliance on coal generation from 30% to below 1% since 2014.[34] **The UK has committed to ending coal electricity generation no later than 2025** and is encouraging other countries to follow suit. The carbon price remains one of several efficient tools in driving decarbonisation.

The government has also ensured that security of electricity supplies remains paramount as the country decarbonises. Since it was established in 2014, the Capacity Market has helped maintain sufficient supply of electricity generation, providing generators with competitively auctioned contracts to be available at periods of peak demand. The UK is also building the first nuclear power station in a generation, at Hinkley Point, which will provide reliable low carbon electricity to power the equivalent of around six million homes a year once it is operational later this decade.

The 2050 net zero goal provides the trajectory within which the government will continue to decarbonise the power sector, while ensuring that the right balance is struck between reducing power sector emissions, maintaining the security of the system and ensuring electricity remains affordable for households and businesses.

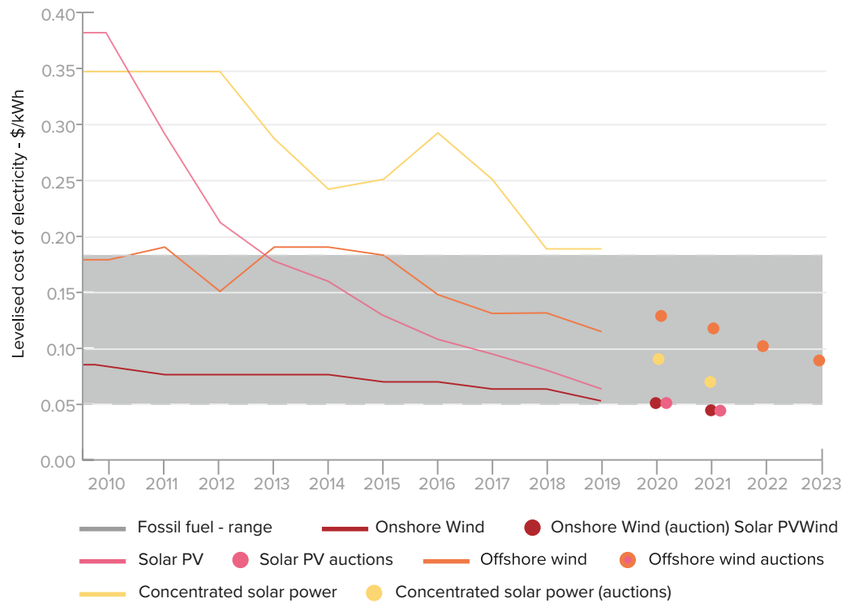
To achieve net zero by 2050, the power system will need to be virtually carbon free and significantly larger to cope with the additional demand from electrification in transport, heating and some industrial processes. This expanded system will require increased investments in network infrastructure, sources of flexibility, such as interconnection, demand response and storage and enough low carbon generation capacity to provide the vast majority of the UK's electricity needs.[35]

The bulk of this generation needed by 2050 will likely be provided by low cost renewables. However, given their intermittent nature there will also be a requirement for more reliable sources of power in the future energy provision of the UK. In particular, power generated from nuclear or power stations that burn hydrogen, or gas with carbon capture and storage. The government will therefore ensure private capital investment is able to continue to finance the energy transition and allow these technologies and network investments to come forward.

There will be decisions on how quickly capital-intensive energy infrastructure is deployed, where the government will ensure costs are minimised and distributed fairly across different groups. The Net Zero Review will look at these questions in more detail, and in spring 2021 will set out how the government will approach such distributional issues and ensure the UK benefits from the opportunities, as well as who bears the costs of the transition.

Price of renewables globally

Source: Climate Change Committee Progress Report 2020



Around £20 billion a year is invested in the energy sector,[36] and there continues to be strong appetite for investment in sustainable energy projects with good environmental, social and governance credentials. The government has played a critical role in bringing technologies to market and reducing the cost of capital through the Contracts for Difference scheme. This competitive support mechanism is now well established and will help support the deployment of renewables as well as other forms of low carbon power.

Other financing models will also be vital to power sector decarbonisation. The Regulated Asset Base (RAB) model has played an important role in encouraging investment into complex infrastructure projects and the government is considering its replicability for energy projects such as nuclear power and carbon dioxide transport and storage.

Renewables

To deliver net zero, the share of generation from renewables needs to dramatically increase. While the UK leads the world in the deployment of offshore wind, greater generation capacity will need to come from onshore wind and solar as well. As recommended by the National Infrastructure Commission (NIC**), the next auction round for Contracts for Difference in 2021 will include technologies such as onshore wind and solar PV.**

The government has also set out an increased ambition to achieve 40GW of offshore wind by 2030. To begin on this path and to increase the amount of renewable capacity needed to further decarbonise power, the government has announced an ambition for the 2021 Contracts for Difference Auction to support up to double the renewable capacity procured in the 2019 round, subject to maintaining competitive tension in the auction.

The government will continue to support the deployment of renewables through competitive Contracts for Difference auctions every two years, with the next due in 2021. Contracts for Difference have proven successful in reducing the cost of capital for renewable technologies, but this has insulated generators from price signals, potentially failing to incorporate the total system costs of intermittent renewables. As the NIC recommended, **the government will ensure that total system costs are considered in designing future Contracts for Difference rounds as far as possible and will publish a call for evidence on the evolution of the Contracts for Difference regime** to explore these issues further.

As renewables deploy at greater volumes it is likely that investors will look to the post-contract market revenues available and will wish to understand what the power market could look like with increasing zero marginal costs generation on the system. The government will continue to ensure that support mechanisms evolve to consider the total system benefits provided by competing generation technologies and flexibility solutions.

Building the sector has required considerable consumer-funded subsidies, which are forecast to reach over £10 billion annually by the end of the year. Following the 2019 auction, however, the latest offshore wind contracts are expected to deliver clean electricity at very low costs, and could even begin generating at below market prices when they start operating in the mid-2020s, meaning a better deal for consumers.

Consistent with the target of 40GW offshore wind by 2030, the government expects around 65% of electricity generated in Great Britain to come from renewable sources by 2030. However, the need to ensure that generation can be brought forward sustainably and at least cost to consumers, and that the sector contributes appropriately to the UK's overall climate goals, means that this is not a strict renewables target.

In partnership with industry, the government will enable the UK to harness more of the economic benefit from the accelerated deployment of renewables technologies, alongside the clean electricity it produces. The Offshore Wind Sector Deal with the renewables sector continues to support these efforts.

As a greater number of offshore wind farms are deployed off the British Isles, there will be many jobs created across the UK. To harness the potential of this new industry **the government has announced £160 million to upgrade UK ports and manufacturing facilities**. This infrastructure funding could help the sector support up to 60,000 direct and indirect jobs by 2030. The offshore wind industry has set a target in its Sector Deal, to secure 60% UK content for the offshore wind supply chain. The government will consult on the introduction of more stringent supply chain plan requirements in future Contract for Difference, including consequences for non-delivery.

The government has also committed to support the development of floating offshore wind, setting a target of 1GW deployment by 2030 to ensure the UK establishes a leadership position in the next generation of offshore wind technology.

Nuclear

Nuclear power has long played an important role in UK power generation and will continue to do so provided it can be delivered to time and budget. Hinkley Point C will be the UK's first new nuclear plant in a generation, and has continued construction throughout the pandemic by adapting to new working environments.

Nuclear is a proven, value-for-money source of reliable low carbon power which can complement renewables. **The government is pursuing large-scale nuclear projects**, subject to clear value for money for both consumers and taxpayers and all relevant approvals, with further details to follow in the *Energy White Paper*.

As outlined in the *Ten Point Plan for a Green Industrial Revolution*, **the government will provide up to £525 million to bring forward large-scale nuclear and invest in the development of advanced nuclear research and development** (R&D), including up to £385 million in an Advanced Nuclear Fund for small modular reactors and advanced modular reactors. This is alongside £220 million for nuclear fusion.

Last year, the government consulted on a nuclear Regulated Asset Base (RAB). The government is considering the responses to this consultation and expects to publish a response in due course. Alongside considering the RAB model the government will also continue to consider the potential role of government finance during construction, provided there is clear value for money for consumers and taxpayers.

Carbon capture and storage

Carbon capture and storage (CCS) will be essential for net zero. Power stations with CCS technologies could provide valuable low carbon electricity when renewables are not generating by capturing the emissions from biomass or gas-powered power generation. CCS will also be essential to decarbonising large parts of industry, producing low emissions hydrogen and in delivering greenhouse gas removal technologies, permanently locking away carbon dioxide.

However, the technology has not been delivered at scale and significant risks remain. Therefore, the government will play a central role in bringing forward this complex infrastructure in partnership with industry over the next decade. The CCS Action Plan sets out the ambition to deploy CCS at scale in the 2030s.[37]

To help deliver on the government's ambitions, Budget 2020 announced that the government will establish CCS in at least two UK sites, along with at least one CCS power station, using consumer subsidies.

The government is now increasing that ambition, and will:

- **Invest £1 billion to bring forward four CCS clusters by the end of the decade, with two to begin construction by the mid 2020s;**
- **Set an ambition to capture 10 megatons of carbon dioxide per year by 2030**; and
- **Outline further details in 2021 on a revenue mechanism to bring through private sector investment** into transport and storage, power and industry CCS and hydrogen projects via new business models to support these projects.

Hydrogen

Hydrogen is a flexible energy carrier that can be burnt as a gas or used in a fuel cell to generate heat or power. It is a leading technology option for decarbonising heavy industry, and could be used to reduce emissions in hard-to-abate modes of transportation, such as heavy goods vehicles or shipping. Almost none of the hydrogen used in the UK today is low carbon, and it is mostly used in the petrochemical sector.

In order to realise the potential of hydrogen the **government is establishing a £240 million Net Zero Hydrogen Fund**. This will provide capital funding to support deployment of low-carbon hydrogen production in the UK, and will support both methane reformation with CCS ('blue' hydrogen), and electrolysis using renewable electricity ('green' hydrogen). Working alongside partners in industry, the government's aim is for the UK to develop 5GW of low carbon hydrogen production capacity by 2030, with a mixture of 'blue' and 'green' hydrogen.

Next year, **the government will set out its approach to growing the hydrogen economy, through a UK Hydrogen Strategy.** The strategy will consider how to continue support for the scale up of low carbon hydrogen production, as well as the interaction with storage, distribution and potential end use demand. It will set out how the UK can capture economic benefits from building a resilient domestic supply chain.

This will include details of hydrogen business models and a revenue mechanism for bringing through private sector investment, to ensure low carbon hydrogen can play a key role in the UK's economic recovery and achieving net zero. It will also set out how the government will support the hydrogen and CCS industries side by side, in conjunction with support for the demand side such as heating trials and support for hydrogen in shipping.

Network reform

As the 2017 Cost of Energy Review and the NIC have pointed out, there is scope for greater competition in delivering the onshore network infrastructure upgrades the UK will require as the energy system decarbonises. Network operators will therefore be required to make investment decisions that are best for the operation of the whole system rather than their own network. The government will outline plans on onshore networks in the forthcoming *Energy White Paper*, including plans to legislate to introduce competition.

The government has already worked with National Grid and Ofgem to give more independence to the transmission system operator for electricity, and expects to see distribution networks take a more active role in system operation. **The government will review the right long-term role and organisational structure for the Electricity System Operator,** in light of the reforms to the System Operator instituted in April 2019. It is possible that there will need to be greater independence from the current ownership structure, should it be appropriate to confer additional roles on the System Operator.

As the power system evolves, the government will need to consider how its own role, as well as the roles of the regulator, the Electricity System Operator, network operators and other energy market participants will change over time. **The *Energy White Paper* will set out the government's approach on the overall governance of the system.**

The evolution of the power system will also require the evolution of the networks to deliver power to people's homes and businesses and to ensure this infrastructure does not hold back the transition to electric vehicles, cleaner sources of heat or greater renewables on the grid. To enable this, government and the regulator will continue to ensure there is a common understanding of the future strategic direction to align policy objectives while maintaining the regulators' independence. If achieved, this approach could provide investors with greater certainty over longer-term investment decisions and support the transition of the energy network.

Industry

Industry accounted for 25% of emissions in 2019.[38] Since 1990, emissions have more than halved due to reductions across all parts of industry, including manufacturing, construction and fossil fuel supply.[39] In the manufacturing sector, greenhouse gas emissions fell by 25% between 2009 and 2017. Analysis from the Climate Change Committee (CCC) suggests this is due to the changing structure of the UK's manufacturing sector, as well as improved energy efficiency and a shift to low carbon fuels.[40]

A mix of technologies will be needed to fully decarbonise industry, because there is a wide variety of sources of emissions across sectors. Options include CCS, electrification of heating, and using hydrogen as a low carbon fuel. These will be considered in the context of changes in the energy sector.

Around half of manufacturing sector emissions in the UK come from major industrial clusters, and targeted public investment in shared infrastructure will help turn these areas into world-leading centres of low-carbon manufacturing, creating jobs and export opportunities.[41] Alongside this, firms will also need to make their processes more energy efficient. **The £315 million Industrial Energy Transformation Fund will support early adoption of energy efficiency and deep decarbonisation projects in energy intensive industries**.

Most energy intensive industries currently receive free allowances under the EU Emissions Trading System (ETS). When the UK leaves the EU, the UK will adopt a replacement carbon pricing system, which will include similar mechanisms to free allocation.

Many of the sectors that receive free allowances are particularly exposed to international trade, and bearing all the costs of decarbonising could be a risk to their competitiveness. As part of the *Industrial Decarbonisation Strategy*, to be published in spring 2021, the government will consider what demand-side policies can drive emissions reductions in industry. These could include developing the market for low carbon industrial products, for example through introducing new product standards to drive demand.

The government will also consider what role fiscal measures should play in supporting industry. As well as up-front capital support for CCS and low-carbon hydrogen production, **the government will set out new business models for industry carbon capture and hydrogen to enable private sector capital investment and support firms' longer-term operating costs**. The government's role will evolve over time, with subsidy reducing as technology matures, supported through an increasing carbon price. The government will consider what trade and diplomatic levers could be used to protect the competitiveness of UK industries as they decarbonise.

Transport

Transport is the highest emitting sector of the UK economy, accounting for 28% of domestic emissions in 2019.[42] Reducing emissions from all modes of transport will therefore be key to achieving the UK's net zero target in 2050. The government is committed to going further and faster to tackle climate change, which is why **the Department for Transport is developing a bold and ambitious Transport Decarbonisation Plan to achieve net zero emissions across all modes of transport**. This Plan will be the biggest piece of work the government has ever done to tackle greenhouse gas emissions from transport. The holistic and cross-modal approach to decarbonising the entire transport system will set out a credible and ambitious pathway to deliver transport's contribution to carbon budgets and meet net zero by 2050.

Road transport is responsible for over 90% of domestic transport emissions and is also one of the biggest contributors to poor air quality in the UK's towns and cities.[43] Decarbonising road transport is therefore particularly important for meeting the interim carbon budgets, as well as cleaning up the UK's air.

To help achieve this, **the Prime Minister has announced that new petrol and diesel cars and vans will not be sold after 2030**. Between 2030 and 2035, any new cars and vans sold with tailpipe emissions should be capable of driving a significant distance with no carbon emissions from the tailpipe. All cars and vans sold after 2035 will be fully zero emissions at the tailpipe. The government will increase the uptake of zero emission vehicles with a package of regulation, incentives and investment in electric vehicle (EV) charging infrastructure, delivered in partnership with the auto sector, consumers and the growing chargepoint industry. As set out by the Prime Minister, in moving forward with this transition the tax system will need to encourage the uptake of EVs and that revenue from motoring taxes keeps pace with this change, to ensure the government can continue to fund first-class public services and infrastructure.

The EV charging ecosystem will be one of the UK's green industries of the future, and the government wants to maximise private sector investment in the delivery of charging infrastructure. However, recognising that it is a new market and that availability of charging infrastructure is a barrier for two thirds of drivers considering the switch to EVs, **the government will kickstart the delivery of a core rapid charging network across motorway and key A road service stations**. By 2023 the government expects to see a high-powered charging hub at every motorway service area, installed by the private sector.

To ensure the private sector can continue to expand the charging network at pace in the 2020s, **the government will invest £950 million in future proofing grid capacity along motorways and key A roads** to prepare for 100% uptake of zero emission cars and vans ahead of need.

The government will also extend support for chargepoint installation at homes, workplaces and on-street locations, but reform these schemes so that they target difficult parts of the market such as leaseholders and Small and Medium Enterprises (SMEs). **Finally, the government has committed £90 million to fund local EV charging infrastructure** to support the roll out of larger, on-street-charging schemes and rapid hubs in England.

Alongside this investment, the government will be consulting on regulations to improve the consumer experience at public chargepoints later in 2020. There are four core areas in the consultation, including payment methods and payment roaming, opening up chargepoint data, increasing the reliability of the charging infrastructure and ensuring pricing transparency. In 2019 the government consulted on proposals to require all newbuild residential properties with associated parking (including a block of flats with an associated car park) to have an EV chargepoint. The government also consulted on requiring all new non-residential properties, with more than 10 parking spaces, to have at least one chargepoint and cable routes for a further one in five spaces. The government will respond to the consultation soon, with regulations being laid in 2021.

At the start of this year, before the COVID-19 pandemic, EV market share had tripled compared to last year, and has held up through the course of the year. To further incentivise drivers to make the switch to an EV, the government uses the tax system to encourage the uptake of cars with low carbon dioxide emissions, which is why users of zero and ultra-low emission cars have beneficial Vehicle Excise Duty (VED) and company car tax rates (CCT) in comparison to conventionally fuelled vehicles. Following Budget, from April 2020, zero emission cars pay no VED at first registration or subsequently. **The Spending Review confirms the government will continue the Plug-in Car, Van, Taxi and Motorcycle Grants until 2022-23**, increasing funding by over £200 million compared to budget 2020, to £582 million in total.

As well as decarbonising private vehicles, the government wants to increase the share of journeys taken by public transport, cycling and walking, and decarbonise buses and trains. Supporting greener buses is another key part of the government's agenda for achieving net zero and tackling air pollution. London now has the largest fleet of electric buses in Europe,[44] and the UK is one of the world's leading designers and exporters of buses. The Prime Minister announced in February that the government would deliver a further 4,000 zero emission buses. **The Spending Review confirms £120 million to deliver an additional 500 zero emission buses in 2021-22**. This builds on up to £50 million investment in the first All Electric Bus Town, which will be announced early next year and is expected to deliver around 300 zero emission buses, supporting greener and cleaner journeys.

Where it is less certain what technology will provide the most effective route to decarbonisation or where it is unclear how the technology can be scaled commercially, the government will fund R&D programmes to support innovation.

Innovation will play a crucial role in decarbonising domestic shipping, for which emissions are likely to be reduced mainly through the scale adoption of alternative fuel systems like hydrogen and ammonia. **The government will provide £20 million in 2021-22 to enable a UK network of technology demonstrations in alternative marine fuels and green shipbuilding**, including hydrogen vessels trials in Orkney and groundworks for a hydrogen port in Teesside. In parallel, the government will consider whether and how the Renewable Transport Fuel Obligation could be used to encourage the uptake of low carbon fuels in maritime, taking the availability of sustainable resources, competing uses and the international character of the maritime sector into consideration.

£21 million will also be provided for the decarbonisation of aviation, through supporting sustainable aviation fuels and zero emission flight infrastructure. This work will be overseen by the recently established Jet Zero Council, a partnership between government and industry to drive the delivery of new technologies and innovative ways to cut aviation emissions. This will fund a one-year competition to support the development of a Sustainable Aviation Fuel (SAF) Demonstration and first-of-a-kind commercial plants. This funding will also kickstart the establishment of a clearing house for SAF, the first of its kind in Europe, to certify new fuels and develop UK expertise. The government will also consult on introducing a SAF mandate. Funding for the Aerospace Technology Institute, which provides match-funding to stimulate the development of innovative and more efficient aircraft technologies, has also been extended.

The UK's airspace is an essential, but invisible, part of its national transport infrastructure. **The government is therefore committed to modernising UK airspace, which will deliver quicker, quieter and cleaner journeys and more capacity** for the benefit of those who use and are affected by UK airspace. The government will continue to co-sponsor the airspace modernisation programme with the Civil Aviation Authority. This will ensure that carbon savings for aviation can be realised though proven technology this decade.

Freight also contributes to pollution and congestion in the UK's urban areas which, left unchecked, will only get worse. The government supports the NIC's recommendations in this area, and believes that through the adoption of new technologies and better recognition of freight's needs in the planning system, it is possible to decarbonise freight by 2050 and manage its contribution to congestion.

Unlike lighter goods vehicles, such as passenger cars and vans, there is currently not a commercially viable path to decarbonise heavy goods vehicles (HGVs) which contribute 17% of UK transport emissions.[45] To support the sector to make the transition to zero emission vehicles, the government will invest £20 million in 2021-22 to establish zero emission road freight trials. These will assess the most effective and commercial path to decarbonising HGVs. The government will also consult on a phase out date for the sale of diesel HGVs.

The government has announced that it will provide a full response to the NIC's Better Delivery: *The Challenge for Freight report*, through the publication of a comprehensive cross-modal freight strategy. This strategy will be published in 2021 and will consider the impacts on the freight system of the end of the transition period as the UK leaves the European Union and the COVID-19 pandemic. Since the publication of *Better Delivery* in April 2019, progress has been made against the recommendations in the report, including on:

- **Better land use planning**: through provision of guidance on how local authorities can assess need and allocate space for logistics in the *Housing and economic needs asssessmen*t, July 2019; and and
- **Data and analysis**: through the ongoing development of a freight mapping tool to enable the UK's freight networks to meet growing demands for faster deliveries while reducing its impact on congestion and the environment. The discovery phase of this project will conclude in December, with further work planned for 2021.

The government has also recently established a Freight Council to provide a forum for discussion with industry stakeholders from all parts of the freight sector. The forum met frequently in the first half of 2020 and will meet quarterly going forward, with a focus on long-term strategic issues for the freight sector.

Buildings

Emissions from UK buildings have declined steadily over the past 20 years, falling 25% since their peak in 2001 due to a range of government interventions and actions by the private sector, many of which have also reduced energy bills.[46]

These include:

- Improving the energy performance of homes through the Energy Company Obligation and public sector buildings through the Public Sector Energy Efficiency Scheme;
- Supporting the roll-out of low carbon heat through the Renewable Heat Incentive;
- Kickstarting the heat networks market through the £320 million Heat Networks Investment Project;
- Setting stretching efficiency standards for new gas boilers;
- Raising minimum standards for both new and existing buildings, and energy related products;
- Introducing minimum energy performance standards for domestic and non-domestic private rented properties and;

- Requiring large businesses to carry out audits every 4 years under the Energy Saving Opportunity Scheme (ESOS), covering buildings, industrial processes and transport, to identify cost-effective energy saving measures.

This year so far, the government has announced further measures to continue this progress, including:

- **Over £3 billion to make homes and buildings greener and more energy efficient** through the Green Homes Grant, Public Sector Decarbonisation Scheme and Social Housing Decarbonisation Fund demonstrator;
- **The introduction of a Future Homes Standard**, in the shortest possible timeframe before 2025, which will ensure new build homes are future proofed with low carbon heat and world leading levels of energy efficiency and consult shortly on increased standards for non-domestic buildings;
- **A new Green Gas Support Scheme** to support the production and injection of green gas (biomethane) into the grid, funded through a Green Gas Levy, and a £270 million Green Heat Networks Scheme, enabling new and existing heat networks to be low carbon and connect to waste heat that would otherwise be released into the atmosphere; and
- **Support for households and small businesses to invest in heat pumps** through a Clean Heat Grant scheme, backed by £100 million of funding.

These policies are driving growth in the energy efficient and low carbon heat sector, with the Office for National Statistics (ONS) estimating 114,000 were employed in the sector in 2018, an increase of 59% since 2015 with a turnover of £16.7 billion[47]

However, the UK continues to have some of the oldest and least energy efficient homes in Europe, and the sector continues to make up 23% of total UK emissions meaning that more ambitious and urgent action is required in this Parliament.[48]

To meet the UK's climate goals, the pace of heat decarbonisation and energy efficiency improvement needs to accelerate. 85% of homes are currently on the gas grid, but to get to net zero, the vast majority will need to stop burning natural gas.[49] This will require further improvements in the energy efficiency of buildings, repurposing the grid to green gases (biomethane or hydrogen), moving to non-grid low carbon heat sources (primarily heat pumps), or to hybrid systems that combine the two. It is not yet clear which of these routes will be best, and it is possible that a variety of solutions will be required for different properties, or in different areas of the country. Making the decision too quickly may lead to inefficient investments and sub-optimal path dependency while uncertainty remains high.

However, with boilers lasting roughly 15 years on average, 2050 is only two heating system replacements away. **Therefore, by the early 2030s the UK needs to be in a position to ensure that the estimated 1.7 million new heating systems being installed each year are ready for net zero. Today, that number is nearer 30,000**. It is therefore necessary to take the steps now to inform decisions about what kind of installation must be made.

In relation to hydrogen, that means supporting activity to determine its safety and feasibility. This includes delivering hydrogen heating trials, where the government is investing £81 million with the goal of beginning a neighbourhood trial by 2023 and a large village trial by 2025. For heat pumps, it means taking large scale 'no regrets' actions which are necessary in all scenarios and can lead to lower consumer bills, reduced fuel poverty and a thriving industry. This includes ramping up the domestic heat pump market to 600,000 installations by 2028, growing heat networks, and improving the energy efficiency of the UK building stock. This will require strong regulation to drive behaviour change and investment from those able to pay, while ensuring that the government supports those who need it.

Action will also be required in the non-domestic sectors. Through the Public Sector Decarbonisation Fund, **the government will continue to take the necessary steps to improve schools, hospitals, prisons and other public buildings**. The government will consult on future building standards and in-use energy performance requirements for non-domestic buildings, and publish a response on non-domestic private rental sector buildings regulation.

More detail on how the government plans to use a combination of regulation and targeted spending to stimulate the energy efficiency market over the next decade, and encourage greater use of clean heat, will be set out in the forthcoming *Energy White Paper, Hydrogen Strategy,* and *Heat and Building Strategy.*

Climate change adaptation

Infrastructure for energy, water, transport and communications underpins activities across society and the economy, yet may be directly or indirectly vulnerable to climate change risks. The second *Climate Change Risk Assessment* (CCRA), published in 2017 identifies the key climate risks to infrastructure, including from groundwater flooding, coastal flooding and erosion, embankment failure, high winds, lightning as well as cascading failures from infrastructure interdependencies.

In the second National Adaptation Programme, the government set out a vision to develop an infrastructure network that is resilient to today's natural hazards and prepared for the future changing climate. The government engages with the Infrastructure Operators Adaptation Forum, a network coordinated by the Environment Agency, Climate Change Committee and National Infrastructure Commission. The Forum enables learning and the sharing of best practice on actions to reduce vulnerability and realise opportunities around interdependencies between infrastructure systems. In addition the government supports and builds capability of organisations reporting under the third cycle of the Adaptation Reporting Power, which opened in January 2019 and runs until Jan 2021. Over 90 organisations have confirmed their participation in this reporting round, including infrastructure operators responsible for energy, water, telecoms, road, rail and ports.

In the 25 Year Environment Plan, the government committed to ensure that all policies, programmes and investment decisions consider the possible extent of climate change this century. As part of ensuring this approach is embedded in policy and programme decisions, the government has revised the *Green Book Supplementary Guidance on Accounting for the Effects of Climate Change* to include updated information on climate evidence and assessments.[50] This guidance is an important tool in supporting departments to meet the Green Book requirement to consider climate risks in policy, programme and investment decisions where appropriate.

The increasingly interdependent nature of the UK's critical infrastructure means that the need to identify and limit cascading risks is only becoming more important. Climate change impacts may result in risks within and between critical national infrastructure sectors.

Nature-based solutions and waste

Climate change has severe implications for natural habitats and biodiversity loss, and it is essential that these twin threats are tackled in parallel. The Review into the Economics of Biodiversity is considering the question of how economic prosperity can go hand in hand with addressing biodiversity loss in a global context. Domestically, nature-based solutions have an essential role to play both in climate mitigation and adaptation. Healthy and restored ecosystems lock away more carbon in plants and soils than degraded ones, while also supporting a more diverse and abundant range of flora and fauna.

The government's Nature for Climate Fund (NCF) will help England to meet its share of the CCC's recommendations to plant 30,000 hectares of trees a year in the UK. Woodlands and urban trees are vital green infrastructure which offer carbon capture as well as a wide range of natural capital and public amenity benefits such as clean water, natural flood alleviation, biodiversity, and urban cooling. **The government will extend the Urban Trees Challenge Fund and invest in Community Forests**. The NCF will also help to restore more peatlands, locking in carbon while providing wider benefits for biodiversity and water. Further detail will be set out in the England Tree Strategy and England Peat Strategy next year.

The UK also needs to go further in increasing its resource-use efficiency, to reduce the burden placed on the natural world through the supply of raw materials and absorbing waste. **The Environment Bill is legislating wide-reaching waste reforms** – including extended producer responsibility (EPR), a deposit return scheme, and consistent collection of food waste and recycling - which will increase resource-use efficiency and cut greenhouse gas emissions from their implementation in 2024. EPR will ensure that the costs of processing packaging waste are transferred from local authorities to manufacturers and sellers. This will encourage innovation in packaging design, leading to a more sustainable use of resources.

In order to prevent the build-up of waste, it is important to be able to follow its journey through supply chains. New waste tracking technology in the UK is the future of a high-tech circular economy underpinned by world class digital infrastructure, and will ensure that all waste movements across the economy can be tracked, supporting resource efficiency as well as informing sustainable future infrastructure investment.

Water and flood risk management

Climate change will continue to increase the risk that there is too much or too little water in the environment – leading to a higher frequency of flooding and drought. Both extremes in weather can cause significant damage and disruption to communities, homes, land and infrastructure.

While it will never be possible to prevent all flooding, taking clear action now to boost nationwide resilience will ensure the impacts from flood events can be minimised and communities can recover more quickly when they do happen. In July 2020, the Secretary of State for the Environment published the government's long-term Policy Statement on flood and coastal erosion risk management.[51] The Policy Statement outlines five ambitious policies and over 40 supporting actions to better protect and prepare the country against flooding and coastal erosion. Alongside the government's policy statement, the Environment Agency published their updated National Flood and Coastal Erosion Risk Management Strategy for England.

At the heart of the government's strategy is its flood and coastal defence investment programme, which provides longer-term certainty of funding, unlocking even greater efficiency in infrastructure investment. Devolved administrations receive funding in-line with the investment. T**he March 2020 Budget announced that, from 2021, the amount invested in the flood and coastal defence programme in England will double to £5.2 billion, delivering 2,000 new defence schemes to better protect 336,000 properties over six years**. This investment will reduce national flood risk by up to 11% by 2027 helping to avoid £32 billion of wider economic damages – benefitting every region of the country. This exceeds the level of investment recommended by the NIC, underlining this government's commitment to ensuring homes and businesses across the country are better protected from the devastating impacts of flooding.

Alongside this commitment, **the government announced a transformative £200 million Flood and Coastal Resilience Innovation Programme**. Through this new programme, managed by the Environment Agency, over 25 local areas in England – urban, rural and coastal, from the North, the Midlands and the South – will be selected to take forward wider innovative actions that improve their resilience to flooding and coastal erosion.

The government agrees with the NIC that there must be a twin track approach to delivering additional water supply and demand reduction to increase the resilience of water supplies. Water companies are responsible for planning to meet future supply requirements through the production of water resource management plans. For the next round of plans due in 2024, **the government will require the water industry to plan to deliver resilience to a one in 500-year drought.**

The Environment Agency published a National Framework for water resources in March 2020, and will support water companies to plan regionally and with other sectors to achieve the right balance of measures to increase resilience. At Price Review 2019, Ofwat agreed up to £469 million of funding for water companies between 2020 and 2025 to progress work on new strategic water resource and transfer infrastructure, as identified in company Water Resources Management Plans. Ofwat has established the Regulators' Alliance for Progressing Infrastructure Development (RAPID) to support this process and overcome barriers which might hamper the development of these strategic schemes.

As well as new infrastructure, the government recognises that demand on water supply must be tackled through reducing the amount of water lost through leaks and reducing the volume consumed by customers. **The government is exploring the possibility of a statutory target to reduce water demand using powers in the Environment Bill**. This would be on the volume of water distributed or abstracted by water companies, encompassing household use, non-household use and leakage. In line with the NIC's recommendations, the water industry has also committed to reduce leaks by 50% by 2050.

Innovative technologies

Since 2016 the government has increased public investment in science and innovation to historic levels. These investments have enhanced understanding of the social, environmental and economic implications of future energy options, helping to create a whole system approach to net zero. This support is helping to bring new innovations to the market. For example, cheaper and more efficient fuel cells and new sustainable biofuels, underpinning the net zero transformation.

At the Spring Budget, the government committed to at least doubling the size of the Energy Innovation Programme. The Energy Innovation Portfolio (now the Net Zero Innovation Portfolio) is designed to reduce the costs of decarbonisation by developing and accelerating near-to market low-carbon energy technologies that will be necessary to achieve net zero emissions by 2050. The portfolio is targeted at the development and demonstration end of the R&D spectrum to bolster technologies such as floating offshore wind, hydrogen and advanced modular nuclear reactors and stimulate private sector investment.

The government is making £200 million of this funding available in 2020-21. Through this programme the government expects to bring down the costs of deploying innovative near-to-market technologies, such as hydrogen. It will also support the commercialisation of new types of firm low carbon power to become available in the 2030s and 2040s, such as inter-seasonal storage, and less intermittent forms of renewables, such as floating offshore wind.

This investment will support leading researchers and innovators from all four nations to discover and create the industries of the future. This funding will boost R&D activity from discovery research to demonstration. Supporting the UK to seize the opportunity of scientific progress to deliver new transformative technologies, enhance the efficiency of existing approaches and support the adoption of emerging technologies across the country.

At the Summer Economic Update the government dedicated £100 million towards Direct Air Capture technologies – as a type of Greenhouse Gas Removal technologies – in order to help achieve net zero by 2050. In October, the Prime Minister also committed to support the development of floating offshore wind, setting a deployment target of 1GW by 2030.

The government is also commissioning the NIC to undertake a new study looking at Greenhouse Gas Removal technologies. This study will report in summer 2021, and the Terms of Reference have been published alongside this Strategy.

Looking to the future

The government will continue to report reductions in the UK's carbon emissions in line with carbon budgets. The government will also monitor air quality, efforts to reduce the impact of climate change (including drought and flooding), progress against statutory fuel poverty targets, progress against the ambition for two million green jobs by 2030 across the UK, and steps to deliver an average building EPC rating of C. And, as the key pathways towards net zero become more well established, the government will track and use real time data, such as EV uptake and heat pump installation, to ensure the fundamental changes in the economy needed to deliver net zero are being delivered.

This Strategy is central to the UK's efforts to achieve net zero emissions by 2050 and delivering the Prime Minister's *Ten Point Plan for a Green Industrial Revolution*. By unlocking private sector investment, the government will accelerate the deployment of existing technologies, and advance innovation in new ones. In doing so, the government will lead the UK through a just transition to net zero, that supports the short-term recovery from COVID-19, andlevels up and unites the nations, by providing long-term sustainable jobs in the future net zero economy.

Supporting private investment

At a glance

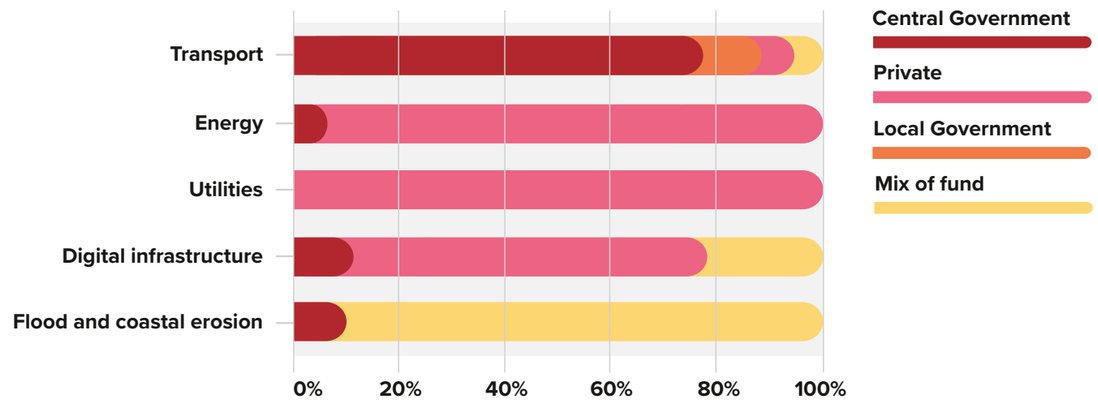
Private investment has delivered major benefits for UK infrastructure and will be vital over the coming decades as the UK moves towards meeting net zero in 2050. The government is committed to supporting private investment and is taking action across the following areas:

- **The government is setting up a UK infrastructure bank**, to co-invest alongside the private sector in infrastructure projects;
- The bank will operate UK-wide, be based in the north of England, and support the government's ambitions on levelling up and net zero;
- The bank will also be able to lend to local and mayoral authorities for key infrastructure projects, and provide them with advice on developing and financing infrastructure;
- **The government is** committed to the model of independent economic regulation, but will refine it to ensure it provides a clear and enduring framework for investors and businesses and delivers the major investment needed in decades to come, while continuing to deliver fair outcomes for consumers;
- **The government will produce an overarching policy paper on economic regulation in 2021**, which will consider regulator duties, injecting more competition into strategic investments, and the benefits of a cross-sectoral Strategic Policy statement; and
- **The government will** continue to develop new revenue support models and consider how existing models - such as the Regulated Asset Base model and Contracts for Difference - can be applied in new areas and remains open to new ideas from the market. **The government will not reintroduce the private finance initiative model** (PFI/PF2).

The private sector plays a vital role in achieving the UK's infrastructure ambitions. Much of UK's economic infrastructure is privately owned, with almost half of the UK's future infrastructure pipeline forecast to be privately financed.[53]

The UK has long been an attractive destination for private investment, underpinned by a sophisticated system of independent regulation, strong legal framework and expertise, and leading professional and financial services sectors. This has drawn investment from both UK and international investors across various sectors including transport, digital infrastructure, and utilities.

Funding mix of UK investment between 2018/19 and 2020/21 by sector



Source: 2018 National Infrastructure and Construction Pipeline

Private investment has delivered major benefits for UK infrastructure. Over the past decade alone, over £200 billion has been invested in the water and energy sectors.[53]

Over the past three decades, this investment has delivered significantly higher service quality for consumers. The number and length of power cuts has more than halved since 2002.[54] From 1990 to 2019, emissions fell 41% while the economy grew 78%,[55] water leaks are down by a third since the mid-1990s[56] and over 96% of premises in the UK have access to superfast broadband (speeds of 24Mbps or more).[57]

Historic levels of investment will be required in UK infrastructure in the coming years, to maintain and upgrade networks to meet the government's objectives for economic growth and decarbonisation. For example:

- Water companies in England and Wales will be investing at least £51 billion between 2020 and 2025;[58]
- The total level of investment required to upgrade the nation's broadband networks to be gigabit-capable speeds is in the region of £30 billion; the vast majority of this is expected to come from the private sector;[59]
- Total annual investment in the energy sector was £19 billion in 2019 and this is expected to increase in the years to come in order to transform energy networks to achieve net zero;[60]
- The Prime Minister's '*10 Point Plan for a Green Industrial Revolution*' will mobilise £12 billion of public investment and potentially three times more from the private sector.

The government remains strongly committed to supporting private investment and maintaining the UK's status as a leading global destination for private investment. That is why the government conducted an in-depth review – the '*Infrastructure Finance Review*' (IFR) – of private investment in infrastructure and asked the National Infrastructure Commission (NIC) to undertake a review of UK's system of economic regulation. **This Strategy marks the government's conclusion to the IFR and response to the NIC study.**

The IFR was launched in Spring 2019, and consulted a broad range of financial and infrastructure experts on: the current state of the UK's infrastructure finance market and the role of the European Investment Bank; the ways in which the government and independent regulators can help facilitate investment; the potential future challenges for infrastructure financing; and the performance and possible improvements to the UK's institutional framework to support infrastructure finance. Further information on the IFR is set out in the government's formal response to the consultation, published alongside this strategy.

The government has heard from the market on the challenges facing UK infrastructure in the coming decades. The IFR found that the UK continues to have fundamental strengths, and the market appetite for investing in UK infrastructure is strong, especially for long-term investments with well-understood risk profiles. But the UK will face new challenges as it seeks to decarbonise the economy and ensure access to high-quality infrastructure across the country. The government needs to do more to attract private investment to deliver the investment needed in this period.

Following the IFR, the government's approach to private investment is built on three key principles:

- **The government will provide investors with long term policy certainty** including where appropriate, directly coinvesting alongside the private sector and acting as a cornerstone investor on key projects through a national infrastructure bank;
- **The government will maintain a strong and enduring system of independent economic regulation,** helping deliver the investment levels the country needs and fair outcomes for consumers of today and the future; and
- **The government will continue to use a range of policy tools and innovative funding mechanisms to embrace opportunities** from new technologies and decarbonise and level up the economy.

A new infrastructure bank for the UK

To underpin this infrastructure revolution and catalyse the private investment the UK needs, **the government is setting up a new infrastructure bank for the UK**. The bank will play a leadership role in supporting private infrastructure projects to help meet the government's objectives on economic growth, levelling up, and transitioning to net zero.

The bank will be headquartered in the north of England, and will operate UK-wide, supporting investment in projects and programmes across the whole of the UK.

In line with the NIC's recommendation, the new bank will operate within a mandate set by government and have a high degree of operational independence. It will be a world-class, expert institution. The bank will play an important role in supporting new infrastructure technologies.

The bank will co-invest alongside private sector investors including banks, institutional investors, sovereign wealth funds, pension funds and global infrastructure investors. It will use a range of tools to support private projects: as well as offering guarantees through the existing UK Guarantees scheme, it will be able to offer debt, equity, and hybrid products.

The bank will be able to lend to local and mayoral authorities for key regional infrastructure projects. It will also be able to provide advice and support to these authorities on developing and financing projects.

The new bank will replace some of the activities of the European Investment Bank (EIB), following the UK's departure from the European Union. However, the bank will provide more targeted support than the EIB, and will be better aligned with the UK government's objectives.

At Budget 2021, the Chancellor will set out comprehensive details regarding the operations, mandate and scale of the bank. The government intends for the bank to be operational in an interim form, from spring 2021, so it can play a role in supporting the UK's economic recovery from the COVID-19 pandemic. The government will legislate for the bank at the earliest opportunity, to put it on a statutory footing.

The role of pension funds

There is a huge opportunity for pension funds to support the UK's infrastructure investment ambitions. The industry anticipates that pension funds and insurers will be able to invest between £150 billion and £190 billion in infrastructure over the next ten years.[61]

Pension funds invest for the long-term and their objectives and investment profiles are well matched to infrastructure investment, particularly in regulated sectors.

The government wants the National Infrastructure Bank to work closely with pension fund and institutional investor market to explore opportunities for a further expansion of pension fund investment in UK infrastructure.

Already this year the government has made changes to make it easier for pension funds to invest in infrastructure. In March this year the Financial Conduct Authority (FCA) made changes to their 'permitted links' rules to allow unit linked pension funds, which are widely used for contract-based pensions investments, to invest in a wider range of illiquid assets.[62]

Furthermore, the recently published Solvency II Review Call for Evidence seeks views from stakeholders on potential areas in which Solvency II could be reformed to better incentivise insurers, who run contract-based schemes, to invest in infrastructure and other long-term productive assets.

The Department for Work and Pensions are considering a number of changes to remove barriers to infrastructure investment including:

- A consultation on changes to the calculation of the default fund charge cap for automatic enrolment schemes to allow greater flexibility for performance-based fee structures and thereby remove a barrier to investment in longer term assets like infrastructure.
- Changes to allow consolidation of smaller pension funds so they may more easily invest in infrastructure.

Economic regulation

The economic regulatory framework is central to the provision of infrastructure, with Ofcom, Ofgem and Ofwat monitoring and refereeing how infrastructure is funded, delivered and operated within their respective sectors.

The UK's framework of strong, independent economic regulation has delivered significant benefits in the utilities sectors. The regulatory model has been integral to attracting over £200 billion of private sector investment in the UK's infrastructure networks and driving higher standards for consumers. The system has also played an important role during the COVID-19 pandemic, helping to ensure that financial assistance has been provided to vulnerable customers and enabling the continuity of vital services.

The government is committed to maintaining this system of independent economic regulation. But it is vital the system can rise challenges of the 21st century, notably the need to decarbonise infrastructure across all networks, adapt to climate change, capitalise on new innovative technologies and take advantage of opportunities arising from leaving the EU.

That is why, in 2018, the government asked the NIC to carry out a study on the regulatory model for water, energy and telecoms sectors. The aim of this study was to assess what changes might be necessary to the existing regulatory framework to facilitate future investment needs, promote greater competition and increase innovation, and meet the needs of both current and future consumers.

The NIC published their report – '*Strategic Investment and public confidence*' – in October 2019, setting recommendations for updating the regulatory model to incentivise long term investment and rebuild public confidence. The government thanks the NIC for their work, and at Budget 2020 the Government announced that it **agrees with the NIC's primary finding that the UK's system of economic regulation is working well but needs updating in some areas to address 21st century challenges**.

The government is committed to taking a long-term approach to investment to provide predictability and the required stability, as well as appropriate incentives to investors. This should also balance the needs of current consumers with those of future consumers. A detailed response to each of the NIC recommendations on economic regulation is set out in '*Response to the Regulation Study - Strategic investment and public confidence*'. The government's position will be expanded further in an overarching policy statement in 2021.

Clear strategic direction

The government is mindful of the uncertainties currently faced by investors in a rapidly changing domestic and international context, and recognises the importance of integrity and consistency within the system to help provide certainty to investors and build consumer confidence.

The NIC stressed the importance of a more transparent strategic framework to help regulators support investments, balancing the long-term priorities with the current needs of consumers.

The government uses strategic policy statements as a formal mechanism to set long-term priorities for the regulated sectors, such as those already issued for Ofwat and Ofcom.

At Budget 2018 HM Treasury and the Department for Business, Energy and Industrial Strategy (BEIS) launched a review of strategic policy statements, concluding in 2019. The government considers that strategic statements have been successful in setting long-term priorities, but also recognises the benefits of having an additional overarching set of strategic priorities to complement and bring focus to sectoral specific strategic policy statements and reflect common challenges faced by regulators, such as data sharing and protection, as well as broader investment priorities such as the net zero and levelling up agendas.

The government supports the NIC's recommendation to create a more transparent strategic framework and commits to producing an overarching policy paper in 2021. This will set out further details on key areas, including commitments to consider regulator duties, inject more competition into strategic investments, and explore the benefits of cross-sectoral strategic policy statements in order to provide greater clarity for regulators, investors and consumers.

Coherent duties to reflect new challenges

Regulators currently have a number of additional duties, beyond their primary duties, which they must consider in carrying out their core functions. For instance, Ofwat has a duty to contribute to the achievement of sustainable development, whilst Ofcom has a duty to consider innovation.

While existing duties vary between regulators, and further consideration should be given to how these are prioritised, the government supports the adoption of a coherent approach to price, quality, resilience and environment in order to meet 21st century challenges and promote innovation and growth. In particular, the government supports the NIC's recommendation that, where relevant, regulators should have duties to support net zero targets. **The government will continue to review the most appropriate measures, including a net zero duty, to ensure that regulators make the necessary contributions to achieve these targets.**

The government also recognises the opportunity for greater collaboration between regulators approaching similar challenges, building on the work of recent years. **The government supports the NIC's recommendation for the UK Regulators Network to have a stronger role, and commits to increasing collaboration, including by reviewing data sharing powers between regulators, with a view to considering how best to encourage regulators to develop joint data sets for 'whole customer' analysis.**

Greater use of competition

To ensure that new infrastructure is delivered in the most efficient and appropriate way, the government supports the NIC's assessment that the use of competition should be harnessed as the most reliable means of supporting innovation and providing enhancements to economic infrastructure.

Competition in investment is already used successfully in economic infrastructure to drive transformational change. For example, competition has driven rapid innovation in mobile networks, seeing mobile data per connection being over six times higher than five years ago. The government will outline plans on electricity onshore networks, including introducing competition, in the forthcoming *Energy White Paper*. The government will also review whether regulators need further powers to promote competition as part of the forthcoming policy paper.

Building public confidence

The government recognises the importance of building public confidence in companies, regulators and investors, to the long-term success of utility provision.

This includes ensuring companies take the needs of the communities they serve into account. To this end, the regulatory framework should be updated to reflect the government's priorities for levelling up and devolution of powers within the UK. **The government agrees with the NIC's proposals for regulators to ensure that devolved administrations, local authorities and metro mayors have sufficient opportunity to contribute to consultations as part of the price control process**.

The government also agrees with the NIC that regulators should be proactive in ensuring that rewards for investors reflect performance. Above all, customers must be confident that companies are well run and governed. Regulators need to deliver this confidence whilst also enabling sectors to be adequately financed so they may perform well for present and future generations. Regulators currently have a range of powers and tools to ensure that the rewards for investors reflect performance, and the government supports their role in driving improvements in this area.

Overall, as the NIC's report demonstrates, updating the UK's regulatory model to further long-term investment and build public confidence will be a vital task over the next few years. These efforts take on even greater significance in the context of the COVID-19 pandemic, where an effective and updated system of independent economic regulation will be crucial to efforts to build back better.

Funding support mechanisms

The UK has a long history of harnessing the innovation and capacity of the private sector to help deliver infrastructure. Meeting the challenge of net zero will require a host of new technologies and a partnership in different forms between the private sector and government to pull them through into commercialisation.

The government has already developed a range of tools to attract investment and will continue to apply these in new areas and develop further innovative models to meet specific challenges. This includes setting revenues and prices on a competitive basis, for example through Contracts for Difference (CfD) in renewable energy; subsidising delivery in uncommercial areas like gigabit broadband rollout; or bespoke mechanisms for new investments such as the Regulated Asset Base (RAB) model for Thames Tideway Tunnel.

The government continues to consider new models and how existing models can be applied in new areas and is open to ideas from the market. Examples include:

- **New support mechanisms:** In 2019, the government consulted on using the RAB model for new nuclear power stations and other energy sources. It has also published a response on business models for carbon capture, and storage (CCS), where it is developing new support mechanisms and markets for industrial emissions technologies, hydrogen production and power plants with CCS technology in order to create innovative solutions to a complex set of incentives. These business models will require careful design to ensure new markets can be established and private investment can be sustained;
- **Opening up existing mechanisms to new areas:** In March 2020, the Government announced that onshore wind and solar PV would be included in the next round of CfD auctions. Since 2009, awarding the ownership and operation of offshore wind network connections through a competitive tender process is estimated to have saved consumers in excess of £700 million.[63] The government will outline onshore network in the forthcoming *Energy White Paper*, including plans to legislate to introduce competition; and
- **Incubating new ideas:** Since 2016, the Government has made the largest increases to public support for research and development (R&D) on record. This investment will support a range of sectors including new opportunities and emerging technologies for infrastructure, construction and manufacture, for example digital manufacturing, robotics and modular methods of construction.

In 2018, the government retired PFI/PF2 for new schemes because of their fiscal risk, inflexibility and complexity. As part of the IFR, alternatives to the PFI and PF2 model were explored and assessed against the government's test for any new private finance model: its benefits must outweigh the additional costs of private finance. No new models were found through this process, and so **the government** will not reintroduce PFI, PF2 or similar models of private finance.

The government still makes payments of nearly £10 billion a year on existing PFI, PF2 and other associated contracts which were entered into by previous administrations. **The government is funding a programme of work to review PFI contracts, to ensure they are well managed.** This includes providing support for authorities taking back PFI assets as contracts expire and delivering extensive contract management training across the public sector.

Accelerating and improving delivery

At a glance

The government wants to deliver infrastructure projects better, greener and faster. That means addressing longstanding challenges such as complex planning processes, slow decision-making, and low productivity in the construction sector. It also means learning lessons from the COVID-19 pandemic, for instance from the approaches that built Nightingale Hospitals in record time, and saw the UK move swiftly to secure access to a range of promising vaccines. Further, there is a clear opportunity with EU exit to change how this government delivers projects, using the flexibility the UK has as a sovereign country to do things differently.

The government set up Project Speed in the summer, to review every part of the infrastructure project life cycle and identify where improvements could be made. Project Speed has developed a comprehensive package of reforms, including:

- **Reform of environmental regulations** to deliver a quicker and simpler framework for assessing environmental impacts and secure better outcomes for the environment;
- **Landmark reform of the planning system including** consulting on amending permitted development rights, to let schools and hospitals be expanded quickly;
- **Transforming the construction sector** to enable it to become more productive, more sustainable and more internationally competitive, with better use of data and modern methods of construction;
- **Ensuring more effective decision making** with streamlined approval processes, more emphasis on quality design, and better monitoring and evaluation;
- **Embedding good design in all infrastructure projects through** planning reforms; and
- **Bringing about a step change in capability and leadership,** accelerating investment in major project expertise and delivery skills and improving the skills base across the country to ensure every area can deliver the infrastructure it needs.

These reforms have already driven substantial progress, and in future mean the UK's vital infrastructure like schools, hospitals, transport and other networks will be delivered better, greener and faster:

- **Better**, because the process of assessing infrastructure projects under the revised methodology will ensure the government is valuing the wider economic, social and environmental benefits of a project. The government will set projects up to succeed by strengthening the assurance and decision-making regime;
- **Greener**, because the requirements of the net zero commitment will be embedded in every stage of the project life cycle and underpin decisions on the technical solutions chosen to achieve the required outcomes; and
- **Faster**, by simplifying and shortening the processes through which projects secure the consents they need to proceed, procure contracts and deliver; while using modern methods of construction, new skills and a strategic relationship with industry which will improve productivity.

The effective delivery of infrastructure is critical to the success of this Strategy. The government and industry must work together in new ways to accelerate the delivery of the government's ambitious infrastructure portfolio, whilst delivering better environmental and biodiversity outcomes in line with the UK's 25 year Environmental Plan.

The UK has proved that it can deliver safe, world-class and innovative infrastructure, such as the A14 upgrade which was delivered eight months early and on budget using innovative procurement and construction methods. However, the project took years to enter construction, and illustrates the well-known and longstanding challenges that government and industry face. The end-to-end delivery process is complex and takes a long time, with some of the most critical projects taking over a decade to move from conception to reality.

Government decision making can be slow and duplicative, as can planning and development regimes. Productivity growth in the UK construction sector remains one of the lowest of all sectors of the economy, in part because the industry has lacked the confidence to invest in innovation and developing capability. The government has too few project delivery professionals equipped with the right skills, and projects are often not set up and managed well enough to anticipate and prevent delays and cost increases.

The COVID-19 pandemic has shown that this does not need to be the case. The government has assembled Nightingale hospitals in lightning quick time. Through the ventilator challenge, government and industry worked together to design, build and procure ventilators at record time and scale. It is time to take these learnings and apply them to infrastructure.

Combined with EU exit, **this provides opportunities to build back better by designing planning and procurement regimes that are tailored to the UK, putting outcomes ahead of process whilst protecting the environment and the nation's biodiversity**. It will also allow the UK to prioritise its own interests when procuring and working with industry, ensuring money spent on infrastructure projects delivers transformational economic, social and environmental outcomes for citizens.

The Prime Minister launched the Project Speed taskforce in summer 2020, which aims to accelerate and improve the delivery of the government's infrastructure portfolio. Project Speed has reviewed the end-to-end delivery process working closely with experts - applying learnings across a number of case study projects to test and iterate a comprehensive package of reforms. On some of these projects, the taskforce has already found potentially significant time savings through more efficient and focused decision making, and will be accelerated further over the course of this Parliament.

A66

The A66 is a critical freight and regional transport route, connecting the North East and North West. This major upgrade programme will dual the six remaining sections of single carriageway between Scotch Corner and Penrith.

The project was programmed to take over fifteen years, including four more years of development and ten years of construction.

The Project Speed review identified ways to save up to 50% of time in the planned construction process, cutting this down from 10 to 5 years through innovative solutions such as standardised, modular and offsite design and construction, alongside more intensive and concurrent delivery.

In aggregate, these interventions could accelerate delivery by around one third, enabling users to benefit from the improved road over five years earlier. Through reviewing the end-to-end delivery schedule of the A66, Project Speed was able to identify, test and iterate reform options to the decision making, planning and construction processes. These reforms will now be rolled out across the government's portfolio, dramatically cutting delivery times and providing benefits to users earlier.

five

Project Speed represents a revolution in the government's approach to delivering infrastructure projects better, greener, and faster. Embedding these reforms will require strong drive from government, legislative reform and strengthening working relationships with industry.

This package of reforms cuts across four areas:

- **Reforming infrastructure planning and better environmental regulations:** accelerating planning permission by removing blockers and inefficiencies in current planning regimes, allowing more dynamic project development whilst ensuring better environmental outcomes after EU exit;
- **Simplifying procurement regulations and modernising the construction sector:** designing more streamlined procurement regulations after EU exit, enabling government to use its weight as a customer to support the construction industry in adopting modern, highly productive practices;
- **More effective decision making:** front-loading decision making – stopping or progressing schemes earlier; streamlining and condensing governance, with assurance and approval milestones planned upfront and bringing in functional expertise earlier; and monitoring and evaluating projects using better data to support continuous improvement and policy reform; and
- **A step change in capability and leadership:** accelerating investment in major project expertise and delivery skills; and recruiting expert leadership and improving the skills base across the country to ensure every area can deliver the infrastructure it needs.

This is a major reform package and the prize is substantial - in aggregate, these reforms could accelerate delivery of infrastructure projects by up to a third. Much of the reform package relates to reserved policy and will apply to England. The UK government will work in partnership with the devolved administrations to ensure learnings and benefits are shared across the four nations.

Reforming planning and environmental regulations

The planning system governs the regulation of land use and development. It is central to addressing the UK's infrastructure priorities, unlocking land to deliver new infrastructure whilst ensuring citizens are empowered to shape their local communities and achieving the best environmental outcomes.

Part of the current planning system can be complex and burdensome, slowing project development and adding costs to construction. They need to be refreshed to address 21st century challenges, as the UK builds back better, greener and faster.

Combined with EU exit, this is a historic opportunity to design more nimble frameworks that speed up the delivery of critical infrastructure while protecting and enhancing England's unique ecosystems. Reforming the planning system is not a task this government undertakes lightly, but it is both an overdue and a necessary reform.

ve

Planning regime for infrastructure

Whilst planning for the UK's largest schemes such as HS2 might require an Act of Parliament, or a special consent under the Transport and Works Act, the majority of infrastructure projects that require consents will use one of two main routes. The Town and Country Planning Act 1947 (TCPA), supported by the National Planning Policy Framework, allows local authorities to make planning decisions for development and infrastructure within their local areas. The Nationally Significant Infrastructure Projects (NSIP) regime is used for projects such as large strategic road schemes and power stations. The NSIP regime is well-respected but is currently not being implemented as effectively as possible, leading to slower delivery times and more uncertainty.

In August 2020, the government published its *Planning for the Future***,** which closed for consultation on 29 October 2020, proposing a wide range of reforms to bring England's planning system under the TCPA into the 21st century.[64] The reforms seek to support the redevelopment of town and city centres for housing and local infrastructure through a simpler and more certain system and unlock the growth potential of areas across the country.

In addition to these reforms, **the government is making it easier and faster to build social infrastructure**, responding to the needs of local communities, such as for schools and hospitals, by consulting on:

- **Amending Permitted Development Rights (PDRs)** through secondary legislation, which will allow for the easier expansion of schools, hospitals and prisons. PDRs accelerate specified types of development through the planning system by allowing development to take place without requiring full planning permission from the local planning authority. This change will enable the extension of the footprint of facilities by 25% or 250 square metres, whichever is larger; and
- **Introducing a faster planning application process** for more substantial school, further education college, hospital and prison developments, through secondary legislation to encourage greater prioritisation of applications by local planning authorities, including a shorter timescale of 10 weeks for determination.

School Rebuilding Programme

The School Rebuilding Programme commits to a 10-year pipeline of 50 schools a year. This long-term pipeline will enable industry to invest in itself, building the capacity to deliver high quality, greener buildings that support the government's 2050 net zero target faster through application of modern methods of construction.

The proposed planning reforms in this Strategy will help to increase the use of permitted development rights to replace buildings on existing school sites, where the development is not on playing field land and does not exceed six metres in height. Many schemes are expected to be eligible for the enhanced PDR, potentially taking months off the planning permissions process for each of those projects.

Major energy, transport, water, waste and commercial projects are consented through the NSIP regime. The regime has a strong track record for delivering robust consents. However, Project Speed has identified risks to the timeliness of ministerial decision making, inefficiencies in the ways in which different public bodies interact with the regime, and scope for improvement including through adoption of digital working practices. Therefore, **the government is establishing a National Infrastructure Planning Reform Programme** to refresh how the NSIP regime operates, making it more effective and bringing government departments together to deliver more certainty in the process and better and faster outcomes. This will:

- Set an ambition to cut timescales by up to 50% for some projects entering the system from September 2023;
- Establish a project "acceleration team" of planning experts to accelerate infrastructure projects through the system, identifying innovative ways to deliver faster planning consents; and
- Monitor the performance of the NSIP regime, coordinate with relevant departments on the need for a review of their National Policy Statements and ensure effective engagement with infrastructure departments, statutory consultees and the Planning Inspectorate and industry.

Environmental regulations

Delivering vital infrastructure whilst protecting and improving the environment is a top government priority. EU exit provides a historic opportunity to design a quicker, simpler framework for assessing environmental impacts and enhancement opportunities, that speeds up the process while protecting and enhancing England's unique ecosystems. This new system for environmental assessment will be tailored to the country's needs, outcomes rather than process-focused, respectful of local democratic processes, and support net gains for biodiversity wherever possible. These reforms include:

- **A new system of environmental assessment (including Strategic Environmental Assessments and Environmental Impacts Assessments)** – to deliver a new framework that provides clarity, removes duplication, and ensures environmental considerations are embedded effectively in decision making at an early stage; and
- **Strategic approaches to the protection of habitats and species,** allowing more dynamic and pragmatic planning, including placing schemes like district level licensing on a statutory footing and developing strategic habitat mitigation and compensation schemes like the Solent nitrate trading platform.[65] This will help unlock development and reduce delays now, while respecting and improving the environment, without requiring wider reforms of the planning system to be in place.

Designing high-performing and beautiful infrastructure

The government wants the planning process to stimulate proposals that are well-designed and will enhance the environment, health and character of local areas. As outlined in *Planning for the Futur*e, the government wants to better incentivise good design and high-quality homes and infrastructure, which should be a central tenet of the planning system and planning decisions.

Good design is also an essential element in securing high performance of infrastructure from the start. In line with the design principles set out by the National Infrastructure Commission (NIC), **the government is committed to embedding good design in all infrastructure projects through:**

- Local plans which set clear rules rather than general policies for development, so that quality cannot be negotiated away nor can the lived experience of the consumer be ignored too readily;
- A reformed planning system which brings forward a new focus on design and sustainability in national policy and practice, building on the *National Design Guide* published in October last year, with a consultation on the proposed *National Model Design Code* later in 2020; and
- Requiring all infrastructure projects to have a board level design champion in place by the end of 2021 at either the project, programme or organisational level, supported where appropriate by design panels.

Simplifying procurement and modernising construction

Up to £37 billion of contracts across economic and social infrastructure will be brought to market over the next year.[66] But current procurement regulations are burdensome, slow and do not do enough to ensure public money delivers high-quality, innovative outcomes.

The COVID-19 pandemic has required a step change in the scale of public procurement, whether it be designing and manufacturing ventilators or building Nightingale hospitals in record time. Combined with EU exit, this is a historic opportunity to improve the UK's regulatory model, building on the lessons from COVID-19 and ensuring greater transparency, fair and open competition. **With a more effective procurement regime in place, government can use its weight as a major buyer to modernise the construction industry and drive better outcomes across the country.**

A simplified procurement regime

Exiting the EU provides the opportunity to streamline regulations, reduce waste and create a simpler, fairer, more flexible and innovative regime for public procurers and for suppliers to government. The government will publish a green paper in due course which will propose radical reform of the procurement rules. These reforms include:

- **Reducing and simplifying the current procurement procedures** which cause unnecessary bureaucracy and confusion for suppliers;
- **Embedding transparency** by default throughout the commercial life cycle so that procurement and contract data can be more easily scrutinised; and
- **Improving the way commercial tools operate,** such as framework agreements, to improve open competition and avoid a situation where potential suppliers are locked out of government business; and
- **Improving the way in which procurement challenges operate** to reduce costs for both the public and private sectors, deterring spurious challenges whilst ensuring that genuine grievances are dealt with efficiently.

With a simpler, fairer and more effective regime in place, the government can use public procurement to drive better economic outcomes across the country – including supporting a more productive, modern construction industry.

Transforming the construction sector

Currently, the UK's construction industry is not living up to its full potential. It contributed £117 billion to the UK economy in 2018 and supports over two million jobs, but is one of the nation's least productive industries, and the built environment is a major contributor to greenhouse gas emissions.[67 68]

The government can use its weight as a major construction client to transform and modernise the industry. The publication of The *Construction Playbook* in winter 2020 will improve how government assesses procures and delivers public works. The *Construction Playbook* will set out policies and principles developed with the private sector and drawing on best practice across the public sector. A multi-year implementation programme will embed The *Construction Playbook* to:

- **Incentivise industry to innovate** by setting clear and appropriate outcome-based contract specifications, rather than defining upfront how infrastructure should be delivered;
- **Support industry to invest in itself** by providing greater certainty of demand with longer term contracting across portfolios. This includes continuing to publish a comprehensive National Infrastructure and Construction Pipeline with the next update in Spring 2021;
- **Facilitate the adoption of Modern Methods of Construction (MMC),** off-site manufacturing by standardising components, designs and interfaces;
- **Further embed digital technologies** to standardise the approach to generating and classifying data, data security and data exchange, and to support the adoption of the Information Management Framework and the creation of the National Digital Twin; and
- **Develop a consistent and mutually beneficial relationship with industry** to move away from a confrontational approach, towards stronger relationship and contract management which will deliver continuous improvement over time.

The Infrastructure and Projects Authority (IPA) will publish *Transforming Infrastructure Performance 2021* next year, providing more detail to industry and partners on the government's shared vision for the future of infrastructure and the roadmap for delivering it, building upon the measures outlined in this Strategy and the *Construction Playbook*.

Health Infrastructure Plan

The Health Infrastructure Plan sets out the Department of Health and Social Care's strategy for investment in NHS Infrastructure, and was taken further in the manifesto commitment to have 40 hospitals built by 2030. Application of the Construction Playbook principles, including a pipeline approach and commercial and procurement strategy which generates market appetite, will incentivise performance improvements over the life of the programme. This will involve the application of MMC and new technologies to facilitate, drive and enable the delivery of this investment in capital infrastructure within the challenging timeframe.

Building a stronger, more diverse and sustainable construction industry will require long-term investment in skills to increase recruitment, improve retention rates and support the industry to adopt new technologies and techniques – particularly in green and digital construction. The government has recognised the importance of investing in skills and training as part of its economic response to COVID-19, and the Prime Minister recently set out his commitment to skills and lifelong learning. Government is taking forward reforms to:

- **Support industry through sustained public investment,** by bringing forward £8.6 billion of decarbonisation, infrastructure and maintenance projects in the summer, and by increasing capital spending next year;
- **Leverage public contracts to boost opportunities** for construction apprentices, traineeships and T levels in the construction sector, and to recruit a more diverse workforce;
- **Improve apprenticeships for employers** across the economy, which the construction industry will especially benefit from, allowing them to transfer more of their unspent levy funds before they expire and use more intensive apprenticeships training options;
- **Introduce construction sector traineeships** to bridge the gap between further education courses and entry to employment; and
- **Allocate funding for adult learners** to access short training modules (4-16 weeks) for upskilling and reskilling via the National Skills Fund investment.

More effective decision making

The government has a long-standing and robust decision-making process in place, supported by the frameworks of the *Green Book* and *Managing Public Money* guidance, HM Treasury and Cabinet Office approvals processes, and internal departmental investment committees. The UK is a world leader in its frameworks for decision making, and models such as the Green Book are followed by many other countries.

However, UK decision making could be faster and more effective. Low investment in regional infrastructure projects has left some parts of the UK behind, and decisions do not always fully capture the government's priority outcomes. Decision making is not always driven by the best data and the process can often be slow and duplicative. Finally, projects don't focus enough on monitoring and evaluation processes that would identify best practice for future decision making.

Reflecting priority outcomes

If the government is to deliver on its ambitions to level up and decarbonise the economy, decision making will need to be more focused on supporting the government's priority outcomes. This means that, for example, projects which significantly reduce regional disparities and carbon emissions should be given greater consideration. **The government is taking forward work in a number of areas to ensure that decision making reflects priority outcomes,** including:

- **The 2020 Spending Review has already started the process,** introducing the new Public Value Framework which establishes a clear link between departments' spending proposals and intended outcomes, thereby supporting the selection of the most effective and impactful projects;
- **The government has launched the trial of a new Project Scorecard** to identify from the outset how projects will contribute to government's priority outcomes. This will give decision-makers better information about the extent to which different investment options deliver their objectives; and
- **The government has also published an updated *Green Book*** following a comprehensive review process. This seeks to rebalance an appraisal process that has frequently relied too heavily on the benefit-cost ratio, to the exclusion of the development of a robust and well-evidenced strategic case. It will also introduce new guidance on analysing place-based and transformational impacts. Together this will support and enable the levelling up agenda.

Better use of data

Good decision making is underpinned by clear and accessible data – both on the nature of the problems that infrastructure is trying to solve, and on the performance of existing infrastructure systems. The NIC's 2018 study *Data for the Public Good* identified that there is currently limited understanding of how the UK's infrastructure works as a system and that use of new technology like sensors, digitalisation, digital twins, the internet of things, big data, and artificial intelligence is piecemeal and not done in a coordinated way. The government will address this by:

- **Launching a new cost benchmarking hub and data platform,** supported by cost estimating best practice guidance to ensure project assumptions are realistic and achievable at the outset, enabling more robust decisions at an earlier stage;
- **Developing a "national digital twin" of the UK's infrastructure systems and built environment.** Smart infrastructure is capable of collecting data about itself as it operates, which can then be used to inform real-world decisions. This is known as a "digital twin". Although many infrastructure owners across energy, waste, transport and water have "digital twins" of their assets, the exchange of data between these systems is often ineffective, making it harder to tackle cross-cutting infrastructure issues such as climate change; and
- **Developing a National Underground Assets Register.** The UK does not have an efficient process for utility asset owners to share their data. This means in order to plan or carry out infrastructure works, planners and excavators must contact all asset-owning organisations in the area, wait for each to respond, then compile information so it can be read and understood by workers. This process is slow, inefficient and limits the speed at which works can be carried out; a comprehensive register of underground assets would help address this. It will also help prevent accidental damage to underground pipes and cables which currently costs the UK economy £1.2 billion per annum and will improve worker safety.[69]

Streamlining processes

The government can further improve the quality and the speed of those decisions, making them well and only once, rather than regularly re-opening and prolonging the process. Project Speed has developed the following reforms to do this:

- **Streamlining and condensing governance** – seeking to remove duplication and speeding up investment approvals at the centre of government by combining HM Treasury and Cabinet Office approvals processes for priority projects;
- **Bringing in specialists and ministers into the process earlier** – to offer expertise, support and provide key decisions early on - progressing or stopping projects at the right time; and
- **Front-end loading planning and decision making** – ensuring all major projects that are complex or novel use the Routemap methodology, a project initiation tool developed by industry and the IPA. A new Project Delivery Framework will be introduced in early 2021, including setting clear standards that must be met at each stage for a project to proceed.

Monitoring and evaluation

Good decision making does not stop with project approval. To ensure the UK is getting the maximum value out of reforms and taxpayer money, the government needs to robustly monitor and evaluate projects during and after delivery. Changes to how the government monitors and evaluates project outcomes will improve how institutions like the NIC and National Audit Office (NAO) hold the government to account.

At the heart of the government's monitoring and evaluation framework is the IPA's oversight of the Government Major Projects Portfolio (GMPP). This ensures robust oversight of government's most complex and strategically significant projects and programmes. **The government is taking action by updating the GMPP to ensure the most critical and complex projects receive robust scrutiny and oversight.** The portfolio has recently been updated, increasing in size by 50% to reflect the full range of major projects delivering government priorities. Further, from April 2021 government departments will be required to collect and report improved project performance data including on; productivity, sustainability, levelling up and innovation to the IPA.

From April 2021, all major infrastructure projects on the GMPP will be required to publish a summary business case following final approval, a close out report following completion and a long-term evaluation five to ten years into operation. Over time this will create an evidence base to support continuous improvement and further policy reform.

A step change in capability and leadership

Strong and accountable leadership is vital to the success of the government's infrastructure agenda and essential for successful delivery across every stage of the infrastructure lifecycle. The government is already investing in building the capability of its leaders through the Major Projects Leadership Academy and associated programmes.

But to build better, greener and faster, the government needs to drive a step change in capability, culture and behaviour. The government needs to equip those accountable for the success of projects – Senior Responsible Owners (SROs), Accounting Officers and Ministers – with the skills and tools they need, and ensure clear accountability, both for project delivery and successful outcomes.

The government is accelerating investment in major project expertise and leadership skills by:

- **Recruiting a pool of major projects experts,** deployed directly into departments, to boost leadership capacity and capability in government major projects, and filling critical gaps in professional delivery roles across the government's major project portfolio;
- **Creating a better deal for major project SROs** to boost capability and capacity across government, by taking forward work to reform selection, remuneration arrangements, grade structures and support, which will attract and retain top talent; and
- **Setting a requirement for projects to demonstrate SRO capability and capacity** through approvals gates, to ensure projects are resourced with leaders with the right level of experience and time to focus on effective delivery.

To complement these reforms, the government is putting in place a new rigorous approach to standards and professional accreditation to build a sustainable skills base by:

- **Establishing a new Government Projects Academy** to set professional standards and equip people across government with the expert skills needed to deliver major projects successfully, putting world class delivery, modern methods and sustainable practices at the heart of training practices. This would be open to project leaders from across the public sector and local government including **making new scholarships available to project leaders in local government;**

- **Introducing a rigorous new approach to developing and accrediting project professionals at all levels,** from foundation to mastery, starting in 2021, with standards set by the new Government Projects Academy; and
- **Establishing training on major project delivery as a core expectation for Ministers and senior officials** as senior sponsors of infrastructure projects, to build understanding of how best to support and challenge major projects to help them succeed.

Looking to the future

This package of reforms will revolutionise the way government operates and transform the way infrastructure projects are delivered, leading to a step-change in delivery speed and quality.

Project Speed has been an effective tool for galvanising Whitehall and industry, challenging the status quo and driving change. However, the job is not yet complete. The taskforce will continue to remove obstacles in the process of delivering infrastructure, challenge assumptions, and develop, test and iterate reforms on case study projects. The reforms will be rolled out across the breadth of the government's infrastructure portfolio through the settlements agreed at Spending Review 2020 and future events.

The government will remain committed to effective infrastructure delivery, implementing reforms at pace, removing barriers to delivery and continuing to test current assumptions. This will ensure that the government's ambitious infrastructure pipeline is delivered better, greener and faster.

Conclusion and next steps

This Strategy sets out the government's plans to transform its approach to infrastructure policy and delivery, to meet both the short- and long-term challenges facing the UK. This Strategy:

- **Provides a long-term perspective without ignoring shorter-term imperatives:** the Strategy puts recent spending announcements in context, emphasises the value of infrastructure investment to support the economic recovery, but also looks beyond the Spending Review to the government's longer-term ambitions.
- **Sets out clear goals and plans to achieve them:** the government has set out clear ambitions across all economic infrastructure sectors, focused on recovery, levelling up and decarbonisation. These ambitions are underpinned by clear actions, with more detail to come in some areas over the coming weeks and months, with more detail to come in some areas over the coming weeks and months.
- **Announces, multi-year funding commitments for key infrastructure programmes** to back up its ambitions, with more details to come at the next Spending Review in 2021. It makes clear that where policy is devolved, the devolved administrations benefit from funding, through the Barnett formula, enabling their investment to support people and business in Scotland, Wales and Northern Ireland. The Strategy also sets out the government's plans to review the National Infrastructure Commission's (NIC's) fiscal remit.
- **Confirms the government's commitment to fundamentally change the way it considers and delivers infrastructure** across the whole of the UK. It matches the spirit and ambition of the NIC's *National Infrastructure Assessment*, in many places exceeding their recommendations.

However, this Strategy isn't the final word on the government's infrastructure plans – it instead represents the first step of a multi-year process to transform the UK's infrastructure networks. The ambitions set out here will be further strengthened by the next Spending Review in 2021. This Strategy will also be enhanced by a series of related publications over the next 12 months, setting out further details on key areas of infrastructure policy, including:

In the next three months:

- The *Union Connectivity Review*
- The *Construction Playbook*
- The *Integrated Rail Plan*
- The *Energy White Paper*

In the next six months:

- The *Net Zero Review* final report
- The *National Infrastructure and Construction Pipeline*
- *Transforming Infrastructure Performance 2021*
- A transport decarbonisation plan

In the next twelve months:

- The *English Devolution and Local Recovery White Paper*
- An electric vehicle charging infrastructure strategy
- A heat and buildings strategy
- A hydrogen strategy
- An industrial decarbonisation strategy
- A refreshed *Industrial Strategy*

Taken together, these documents will set out the full scope and scale of the government's ambitions to level up and unite the country, decarbonise the economy, and revolutionise how the UK funds and delivers infrastructure.

Inclusive infrastructure

Much of the UK's infrastructure was built at a time when the needs of disabled people were not sufficiently prioritised. The consequence has been decades of retrofitted solutions – often expensive, unattractive, and achieving only 'accessibility'. It is vital that the UK's future infrastructure is fully inclusive of everyone, including Britain's 14.1 million disabled people.

The government is determined to transform the lives of disabled people, who for far too long have encountered barriers to enjoying the day to day activities and opportunities that others can take for granted. Infrastructure is a key part of this, and **in Spring 2021 the government will publish a** *National Strategy for Disabled People*, expanding on the ways that the government will pursue inclusion and extend opportunities for disabled people across all aspects of life.

The future of the National Infrastructure Commission

The NIC's exceptional analysis underpins many of the measures announced in this Strategy, and their National Infrastructure Assessment has influenced government decision making since its publication in 2018.

Looking forward, the NIC will now begin preparations for the second 'National Infrastructure Assessment' due for publication in 2023. This new, comprehensive review of the UK's evolving infrastructure priorities will have to take the ambitions and plans set out in this Strategy into account. It will also have to assess the longer-term impact of COVID-19 on economic infrastructure sectors, including any behaviour and technological changes catalysed by the pandemic.

In the meantime, the government has identified new priorities for the NIC for 2021, and is commissioning a new study on greenhouse gas removal technologies which will report next summer. The NIC will provide recommendations to government on:

- the technologies that should be deployed to deliver negative emissions;
- the policies needed to incentivise the rollout of these technologies; and
- the timeline of decisions needed by government to enable the UK to use negative emission technologies to achieve net zero.

The term of reference for this work have been published alongside this Strategy.

The government is also committed to ensuring the NIC maintains its reputation as an impartial, expert body. Building on the new and re-appointments announced earlier this year,[70] the government will shortly launch a competition to appoint several additional Commissioners. This will help strengthen the NIC's expertise in key areas – including local government and environmental issues – and increase the diversity of the Commission.

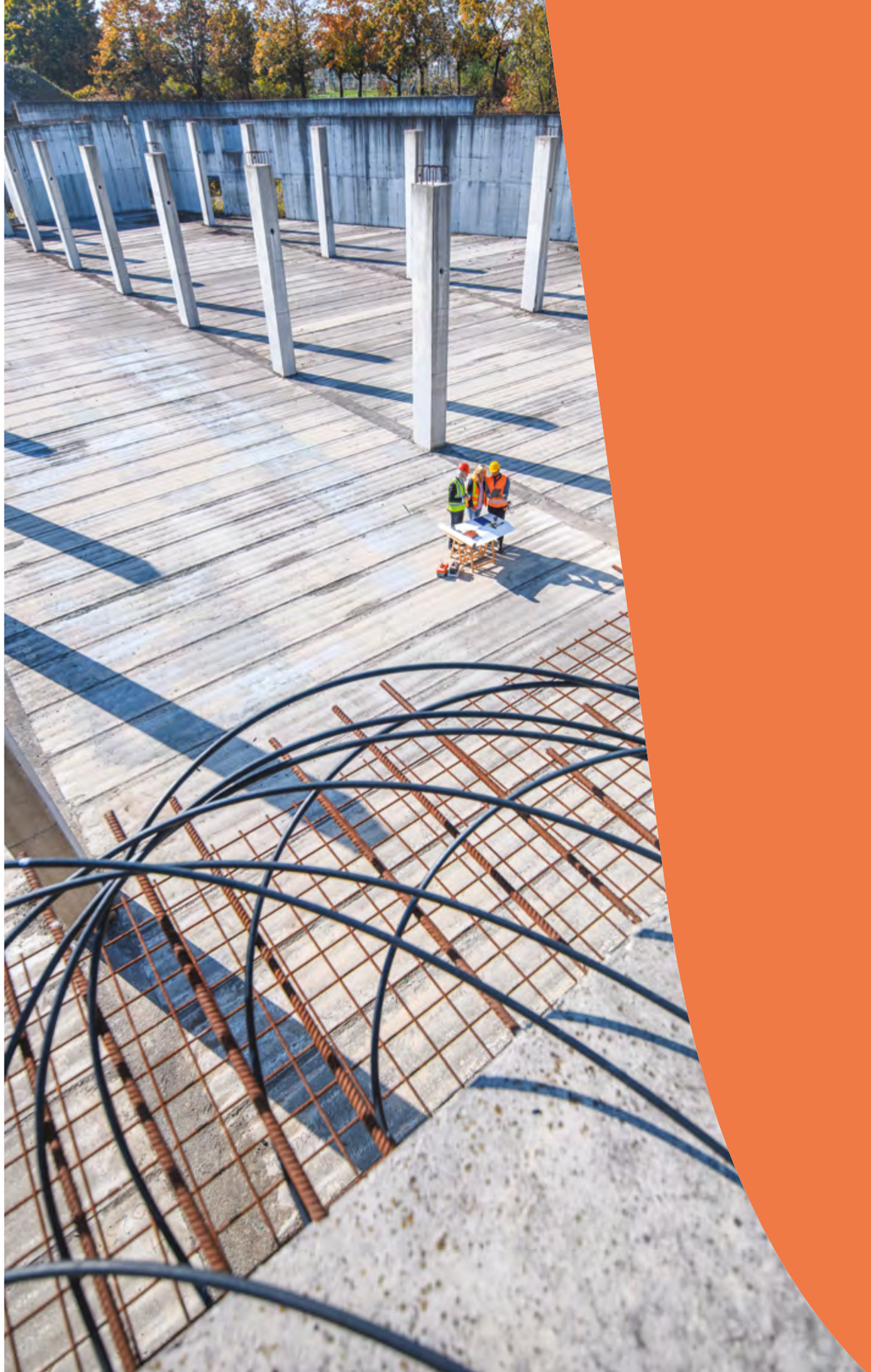
The government will also review the NIC's role and responsibilities in 2021, including updating their Charter and Framework documents if necessary, to ensure the Commission can continue to shape and support this government's infrastructure ambitions. This work will be carried out alongside a review of the NIC's fiscal remit.

Responding to NIC studies

Since the National Infrastructure Assessment was published in 2018, the NIC has also produced three separate studies: on freight, economic regulation and resilience. The response to the NIC's regulation recommendations has been provided in 'Government response to NIC regulation study – Strategic investment and public confidence.' The Department for Transport will also provide a formal response to the Freight Study in 2021.

The NIC resilience report, 'Anticipate, React, Recover: Resilient infrastructure systems', published in May 2020, proposes a new framework for resilience and makes a series of recommendations to government to help ensure infrastructure operators can deliver and maintain truly resilient infrastructure. The current public health situation has shown that unpredictable 'black swan' events can and do happen, and that preparedness for these shocks is vital.

In light of COVID-19, and given the ever-present threat of climate change, there is a stronger case to talk about resilience of infrastructure – both in the context of the current pandemic and also the increasing risks from climate change and other threats. The government will therefore respond in full to the NIC report in early 2021.



Footnotes

[1] Provisional Emissions, on a source basis, mapped to CCC sectors, Department for Business, Energy & Industrial Strategy, 2019

[2] 'Experimental comparisons of infrastructure across Europe', ONS, May 2019. 'The effect of the size and the mix of public spending on growth and inequality', J Fournier and Å. Johansson, OECD Economics Department Working Papers No.1344, November 2016.

[3] 'The Global Competitiveness Report 2019', World Economic Forum, October 2019

[4] 'Hours spent in road congestion annually', JRC using TomTom data, 2017

[5] 'Digital Economy and Society Index 2020 (DESI)', European Commission, October 2020

[6] See 1, J Fournier and Å Johansson

[7] 'National Infrastructure Assessment', National Infrastructure Commission, July 2018.

[8] Excluding Barnett consequentials

[9] 'Why does birthplace matter so much?', Journal of Urban Economics, March 2019

[10] 'Action for Roads: A network for the 21st Century', Department for Transport, July 2013

[11] 'Statistics on transport use during the coronavirus pandemic', Department for Transport, November 2020

[12] 'Gear Change: a bold vision for cycling and walking', Department for Transport, July 2020

[13] 'Annual bus statistics: England 2018/19', Department for Transport, December 2019

[14] 'Transport Statistics Great Britain 2019: Moving Britain Ahead', Department for Transport, 2019[15] ICE State of the Nation 2020, Infrastructure-and-the-net-zero-target

[15] 'Five largest OECD fixed and mobile broadband markets', OECD, December 2019.

[16] 'Online shopping continues to grow', European Commission: Eurostat, April 2020

[17] HM Treasury calculations based on 'Improving Broadband', National Audit Office, October 2020

[18] HM Treasury calculations based on data from 'Connected Nations', Ofcom, and data from thinkbroadband, www.thinkbroadband.com

[19] 'Connected Nations Update: Summer 2020', Ofcom, September 2020

[20] 'Measuring the Impact of Proximity and Transport Performance', International Transport Forum, 2019

[21] 'Aviation 2050: The Future of UK Aviation', HM Government, December 2018

[22] Department for Transport analysis of UK Civil Aviation Authority data, 2019

[23] 'Population estimates for the UK, England and Wales, Scotland and Northern Ireland: mid-2019', Office for National Statistics,June 2020.

[24] 'The Low Carbon Economy Index', PWC, 2019

[25] 'The Economics of Climate Change: The Stern Review', Cambridge University, 2007

[26] 'State of the Nation 2020: Infrastructure and the Net Zero target', Institute of Civil Engineers, July 2020

[27] 'Reducing UK emissions: 2020 Progress Report', Committee on Climate Change, June 2020.

[28] 'Energy Prices and Bills: 2017', Committee on Climate Change, March 2017

[29] Provisional UK Emissions 2019 – mapped to Committee on Climate Change sectors, Department for Business, Energy & Industrial Strategy

[30] 'Energy consumption in the UK', Department for Business, Energy & Industrial Strategy, October 2020

[31] 'Digest of UK Energy Statistics (DUKES) 2019', Department for Business, Energy & Industrial Strategy, July 2019

[32] See 28

[33] See 28

[34] See 30

[35] 'Net Zero Technical Report', Committee on Climate Change, May 2019

[36] 'Energy in Brief', Department for Business, Energy & Industrial Strategy, July 2020

[37] 'Clean Growth: the UK Carbon Capture Usage and Storage deployment pathway', Department for Business, Energy & Industrial Strategy, November 2018

[38] See 29

[39] See 29

[40] See 27

[41] Analysis of National Atmospheric Emissions Inventory 2017 Data, by Department for Business, Energy & Industrial Strategy

[42] 'Provisional UK greenhouse gas emissions national statistics', Department for Business, Energy & Industrial Strategy, 2019

[43] 'Transport statistics Great Britain', Department for Transport, December 2019

[44] 'London's electric bus fleet becomes the largest in Europe', London Assembly, September 2019.

[45] See 43

[46] See 29

[47] 'Low carbon and renewable energy economy, UK 2018', Office for National Statistics, January 2020

[48] 'Green Deal and Energy Company Obligation', National Audit Office, April 2016

[49] Sub-national Electricity and Gas Consumption', Department for Business, Energy & Industrial Strategy, December 2019

[50] 'Green Book Supplementary Guidance on Accounting for the Effects of Climate Change', HM Treasury, February 2012

[51] 'Floods and coastal erosion risk management – policy statement', Department for Environment, Food & Rural Affairs, July 2020

[52] 'National Infrastructure and Construction Pipeline, 2018', Infrastructure and Projects Authority, November 2018

[53] Strategic Investment and Public Confidence', National Infrastructure Commission, October 2019

[54] 'What do energy networks do for you?', Ofgem, February 2017

[55] 'Reducing UK emissions: 2020 Progress Report', Climate Change Committee, June 2020

[56] 'Third years on, what has privatisation achieved?', Water UK, July 2019

[57] 'Building Digital UK', Department for Culture, Media & Sport, November 2020

[58] '2019 Price Review: Final determinations', Ofwat, December 2019

[59] 'Future Telecoms Infrastructure Review', Department for Culture, Media & Sport, July 2018

[60] 'UK Energy in Brief 2020', Office for National Statistics, July 2020

[61] 'The Power of Pensions', Legal & General, June 2020

[62] 'Amendment of COBS 21.3 permitted link rules – final rules and feedback to CP18/40', Financial Conduct Authority, March 2020

[63] 'Offshore windfarm links tendering regime enters fifth round with projects worth £2 billion', Ofgem, September 2016

[64] 'Planning for the Future', Ministry of Housing, Communities & Local Government, August 2020

[65] 'Environment Bill resumes passage through Parliament', Department for Environment, Food & Rural Affairs, November 2020

[66] 'Analysis of the National Infrastructure and Construction Procurement Pipeline 2020/21', Infrastructure and Projects Authority, June 2020

[67] 'Briefing Paper 01432: Construction Industry: statistics and policy', Chris Rhodes, December 2019

[68] Construction Statistics, Great Britain: 2018, Office for National Statistics, 18 October 2019

[69] 'What do utility strikes really cost?', L. Makana, N. Metje, I. Jefferson, and C. Rogers, University of Birmingham, 2016; and 'Causes, impacts and costs of strikes on buried utility assets', N. Metje, A. Bilal, S. Crossland, Institute of Civil Engineers, 2015

[70] 'National Infrastructure Commission boosted by new appointments', HM Treasury, September 2020

HM Treasury

CCS1120538354

978-1-5286-2259-2