

# ***Building to Grow***

## ***An East Midlands Infrastructure Perspective***

**East Midlands Infrastructure Partnership**

**March 2025**



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## Executive Summary

The East Midlands is a region with 5 million people and 368,000 businesses<sup>1</sup>. Total regional output in 2022 (as measured by GDP) was £146.4bn, equivalent to 5.8% of the UK economy. GDP in the East Midlands has been growing at or around the UK average for much of the last 20 years, but productivity per worker is below the UK average and has been declining<sup>2</sup>.

The population in the East Midlands has been growing rapidly - at the same rate as London and faster than the South East and the West Midlands<sup>3</sup>. The East Midlands has therefore been growing its economy by growing its population; not by becoming more productive.

All sectors covered by the Government's definition of economic infrastructure are important to the East Midlands. However, the following are of particular importance to increasing productivity, delivering growth and supporting the national transition to net-zero:

- **Transport:** The East Midlands is heavily car dependant and has the lowest level of spend per head on transport of any UK region/nation, undermining regional productivity<sup>4</sup>.

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<sup>1</sup> [Regional and National Economic Indicators - House of Commons Library \(parliament.uk\)](#)

<sup>2</sup> <https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/regionaleconomicactivitybygrossdomesticproductuk/1998to2022#gross-domestic-product-by-uk-country-and-region>

<sup>3</sup> [Population and household estimates, England and Wales - Office for National Statistics \(ons.gov.uk\)](#)

- **Flood Risk Management:** The East Midlands has the largest number (and highest proportion of) properties at risk of fluvial and coastal flooding<sup>5</sup>, as well as much of the nation's Grade 1 agricultural land.
- **Energy Supply:** The East Midlands powered the nation's electricity grid in the 20<sup>th</sup> century and is exceptionally well-placed to lead the transition to net zero<sup>6</sup>.
- **Water Supply and Quality:** Rapid housing and population growth along with the impacts of climate change will require significant investment in water resources and treatment<sup>7</sup>.

Based on our analysis, EMIP makes four strategic recommendations for change:

1. **Better Integration:** NISTA should establish mechanisms to bring sectors together to holistically and strategically manage regional infrastructure as a system, to identify potential bottlenecks, reduce harmful emissions, optimize performance and plan for future needs.

<sup>4</sup> [Public Expenditure Statistical Analyses 2024 - GOV.UK \(www.gov.uk\)](#)

<sup>5</sup> [National assessment of flood and coastal erosion risk in England 2024 - GOV.UK](#)

<sup>6</sup> [Beyond 2030 | National Energy System Operator](#)

<sup>7</sup> [A summary of England's revised draft regional and water resources management plans - GOV.UK](#)

2. **Regional Granularity:** Improved regional granularity is needed within the 10 Year National Infrastructure Strategy and pipeline, so that demand can be anticipated, supply chains can build capacity, and the higher education and skills sector can plan the courses needed to train young people.
3. **A Focus on Existing Assets:** The maintenance of existing assets should have greater priority in infrastructure spending programmes, nationally and locally.
4. **Improved Communication and Engagement:** Better, meaningful communication with the public and local politicians is needed to demonstrate the benefit of nationally significant infrastructure projects, and to address local concerns transparently.

# 1. Introduction

## About East Midlands Infrastructure Partnership (EMIP)

- 1.1 The East Midlands Infrastructure Partnership brings together East Midlands Councils, which is the region’s representative body for local government, and the Institution of Civil Engineers in the East Midlands, as well as other sector specific stakeholders.
- 1.2 The principal purpose of the partnership is to provide informed, strategic and objective advice on behalf of the East Midlands in respect of the critical infrastructure that underpins communities and services. EMIP facilitates discussion and debate, brings together evidence and analysis and makes representations to Government and national bodies as necessary.

## The Institutional Landscape of the East Midlands

- 1.3 Currently there are 39 local authorities in the East Midlands:
- 6 Unitary Authorities
  - 4 County Councils
  - 29 Districts & Boroughs
- 1.4 In addition, the East Midlands Combined County Authority covering Derbyshire and Nottinghamshire was established in

May 2024, and a Greater Lincolnshire Combined County Authority will be fully established in May 2025.

- 1.5 The December 2024 English Devolution White Paper<sup>8</sup> sets out the Government’s intention to extend the mayoral combined authority model throughout the rest of the country by the end of the Parliament.
- 1.6 The White Paper also set out a process for replacing two tier local government with unitary authorities (with a threshold population of 500,000) on a similar timescale. This will have a major impact on the East Midlands and could result in as few as nine councils serving the region by May 2028.
- 1.7 The establishment of unitary local government will also have implications for the region’s two combined county authorities.

## Establishment of NISTA

- 1.8 In October 2024, the Government announced its intention to combine the functions of the National Infrastructure Commission and the Infrastructure and Projects Authority into a new organisation - the National Infrastructure and Service Transformation Authority (NISTA) - to be operational by spring 2025.

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<sup>8</sup> [English Devolution White Paper - GOV.UK](#)

1.9 NISTA will bring oversight of strategy and delivery into one organisation, while driving more effective delivery of infrastructure across the country. In short, it will bridge the gap between what is built and how it is built.

### **10 Year Infrastructure Strategy**

1.10 The Government is committed to publishing a 10 Year Infrastructure Strategy in the spring of 2025. This will set out the Government's long-term plans for infrastructure in the UK and will include social infrastructure and housing, as well as economic infrastructure. The strategy is designed to guide and inform the Government's investment plans and provide the private sector with greater certainty and confidence.

### **The Purpose of this Document**

1.11 The purpose of this document is to:

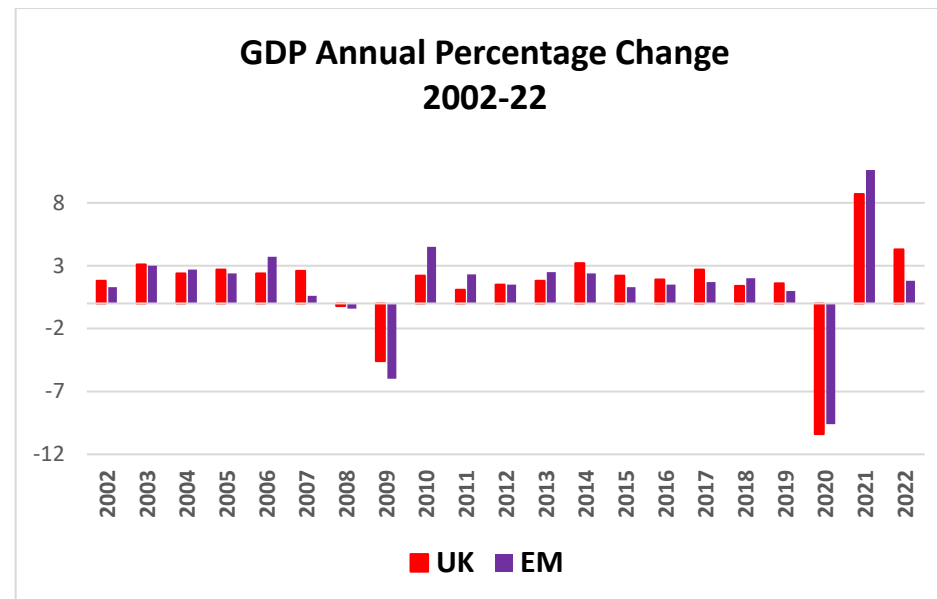
- Inform the work of NISTA and the development of Government's 10 Year Infrastructure Strategy; and
- Provide a resource for regional stakeholders to draw upon which could be updated on a periodic basis.

## 2. Regional Economic & Population Drivers

### Growth & Productivity

2.1 The East Midlands has a population of 5 million people and 368,000 businesses<sup>9</sup>. Total regional output in 2022 (as measured by GDP) was £146.4bn, equivalent to 5.8% of the UK economy. The East Midlands employment rate is just above the UK average at 75.8% (UK=75.0%). Median weekly earnings are below the UK average: £640pw compared to £682pw. 10.6% of the workforce work in manufacturing, compared with 7.0% for the UK – although this percentage has declined significantly in recent years. The region’s unemployment rate has recently increased and is now above the UK average: currently at 4.4% compared to 4.0%.

2.1 GDP growth in the East Midlands over the last 20 years has been better than most other regions/nations and generally close to the UK average. More recently it has fallen<sup>10</sup>.



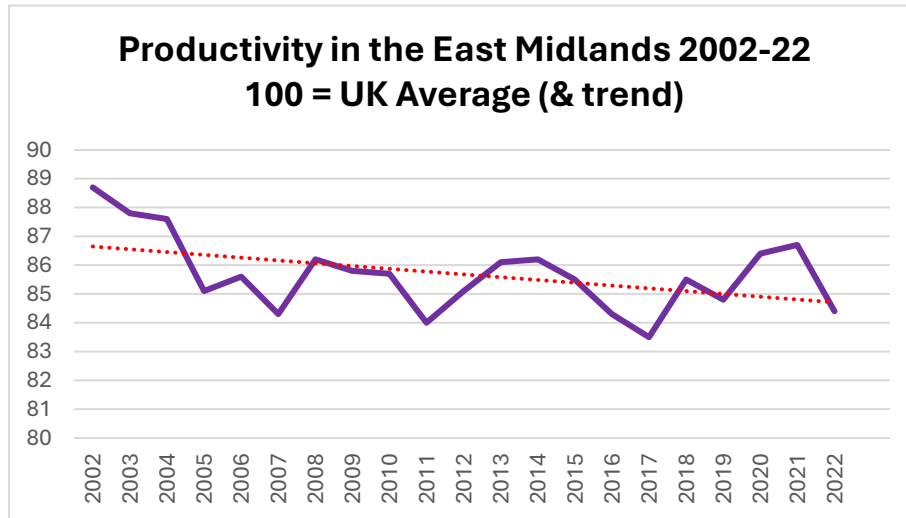
Source: [Regional gross domestic product: all ITL regions - Office for National Statistics](#)

2.2 Productivity has remained below the UK average over the last 20 years and has been declining relative to the UK to 84.4% in 2022<sup>11</sup>.

<sup>9</sup> [Regional and National Economic Indicators - House of Commons Library \(parliament.uk\)](#)

<sup>10</sup> <https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/regionaleconomicactivitybygrossdomesticproductuk/1998to2022#gross-domestic-product-by-uk-country-and-region>

<sup>11</sup> [Annual regional labour productivity - Office for National Statistics \(ons.gov.uk\)](#)

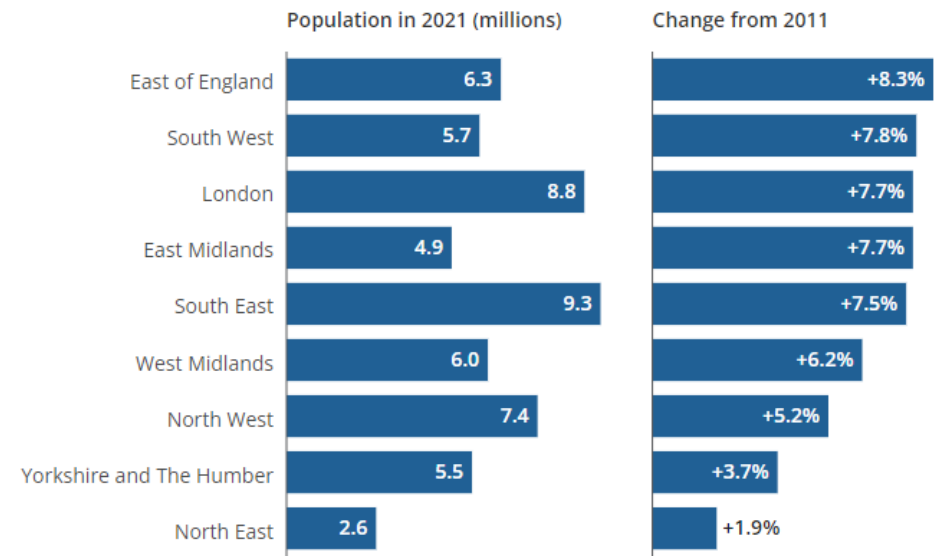


Source: Annual regional labour productivity - Office for National Statistics (ons.gov.uk)

2.3 The East Midlands benefits from a network of excellent universities and some key sector strengths including: high value manufacturing, the nuclear industry, food-processing and logistics - as well the UK's only inland 'Freeport'. But maximising the collective agglomeration impacts of these assets remains a challenge and the region's cities continue to perform poorly on measures of relative UK competitiveness<sup>12</sup>.

### Population Change

2.3 The population of the East Midlands has grown by 7.7% in the period 2011-21: at the same rate as London and faster than the South East and the West Midlands.



Source: [Population and household estimates, England and Wales - Office for National Statistics \(ons.gov.uk\)](https://ons.gov.uk/population-and-household-estimates-england-and-wales)

2.4 The region has therefore been growing its economy by growing its population - not by becoming more productive.

2.5 The East Midlands is not a heavily urbanised region - most people live outside the region's cities. Nottinghamshire and

<sup>12</sup> [UK Competitiveness Index 2023](#)

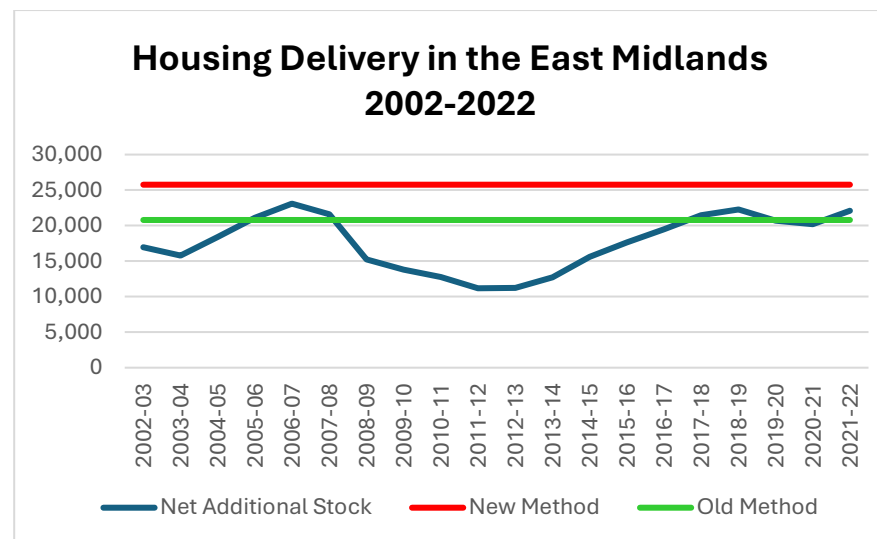
Derbyshire remain the most populous counties, but they are also the slowest growing. Since 2011, population growth has been strongest in Northamptonshire, Leicester City and Leicestershire. The region’s elderly population is increasingly concentrated in more rural areas, where typically 20-25% of people are over 65 years old. In contrast, the median age of Nottingham’s population is just over 30 years old.

2.6 These population trends will have long-term implications for the provision of public services and economic infrastructure in the East Midlands.

### Housing Delivery

2.7 Housing delivery in the East Midlands over the last 20 years is set out below. As elsewhere, the scale of delivery has been largely determined by macro-economic conditions rather than local policies, but in recent years has been at or around the Government’s expectations.

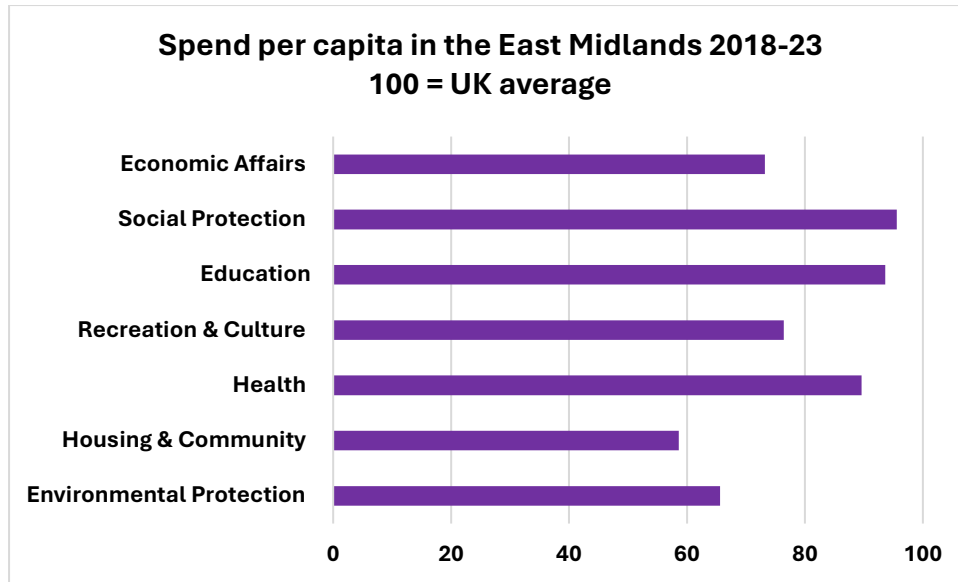
2.8 However, the Government’s new Standard Method for determining housing need implies an uplift from historic levels of delivery, and a generally more dispersed pattern of distribution with the highest increases in rural and suburban areas.



### Public Investment

2.9 The Treasury publishes an annual Public Expenditure Statistical Analysis (PESA) every July on where public money (capital and revenue) is spent and on what, in the previous financial year<sup>13</sup>. The data has the status of ‘National Statistics’ as defined by ONS and has been published on a broadly consistent basis over several decades. Over period 2018-23, total spend per head in the East Midlands on the functions listed below were all well below the UK average – some significantly.

<sup>13</sup> [Public Expenditure Statistical Analyses 2024 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/public-expenditure-statistical-analysis-2024)



Source: [Public Expenditure Statistical Analyses 2024 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/public-expenditure-statistical-analyses-2024)

2.10 Rebalancing national investment so that it more closely relates to population, housing and economic growth is a key strategic objective for the East Midlands.

### 3. Priorities for Economic Infrastructure

#### National Infrastructure Assessment 2

3.1 The NIC's second National Infrastructure Assessment, published in October 2023<sup>14</sup>, set out advice in priorities for investment in economic infrastructure covering: energy, transport, water and wastewater, waste, flood risk management and digital communications.

3.2 Key recommendation to the Government include:

- Adding low carbon, flexible technologies to the electricity system to ensure supply remains reliable and creating a new strategic energy reserve to boost the country's economic security.
- Making a clear decision that electrification is the only viable option for decarbonising buildings at scale, getting the UK back on track to meet its climate targets and lowering energy bills by fully covering the costs of installing heat pumps for lower income households and offering £7,000 support to all others.
- Investing in public transport upgrades in England's largest regional cities to unlock economic growth, improving underperforming parts of the national road network and developing a new, comprehensive and long-term rail plan which will bring productivity benefits to city regions across the North and the Midlands.

- Ensuring gigabit capable broadband is available nationwide by 2030 and supporting the market to roll out new 5G services.
- Preparing for a drier future by putting plans in place to deliver additional water supply infrastructure and reduce leakage, while also reducing water demand.
- Setting long-term measurable targets and ensuring funded plans are in place to significantly reduce the number of properties that are at risk of flooding by 2055.
- Delivering a more sustainable waste system by urgently implementing reforms to meet the 65% recycling target by 2035 and creating stronger incentives for investment in the recycling infrastructure that will be needed in the future.

#### NIC Fiscal Mandate

3.3 The NIC recommendations are made within a fiscal mandate set by Treasury, equivalent to between 1.1 and 1.3 per cent of GDP each year - or on average just over £40bn at 2022 prices. On a per-capita basis, this would be worth around £3bn a year to the East Midlands.

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<sup>14</sup> [Final-NIA-2-Full-Document.pdf](#)

### Sector Priorities for the East Midlands

3.4 All sectors covered by the Government’s definition of economic infrastructure are important to the East Midlands. However, the following are of particular importance and are examined in further detail in this report.

- **Transport:** The East Midlands is heavily car dependant and has the lowest level of spend per head on transport of any UK region/nation, undermining regional productivity<sup>15</sup>.
- **Flood Risk Management:** The East Midlands has the largest number (and highest proportion of) properties at risk of fluvial and coastal flooding<sup>16</sup>, as well as much of the nation’s Grade 1 agricultural land.
- **Energy Supply:** The East Midlands powered the nation’s electricity grid in the 20<sup>th</sup> century and is exceptionally well placed to lead the transition to net zero<sup>17</sup>.
- **Water Supply and Quality:** Rapid housing and population growth, together with the impacts of climate change, will require significant investment in water resources and treatment<sup>18</sup>.

### Sector Interdependencies

There are major interdependencies between sectors that must also be considered. For example:

- Easily accessible EV charging infrastructure is essential to reducing CO2, NOx and particulate pollution from trains, lorries and cars; placing increased demand on green energy infrastructure;
- On-shore infrastructure associated with offshore wind and sub-sea cables requires the security of sustainable coastal flood defences;
- Pollution and surface water run-off from transport infrastructure adds to the challenge of wastewater treatment and cleaning our rivers;
- Accelerating housing delivery whilst achieving net zero will require the rapid deployment of domestic heat pumps and electric vehicle charging points;
- All forms of infrastructure will need to become more resilient to extreme weather events resulting from climate change;
- Skills and training challenges are common across sectors and require a common understanding of demand and collaborative forward planning.

<sup>15</sup> [Public Expenditure Statistical Analyses 2024 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/public-expenditure-statistical-analyses-2024)

<sup>16</sup> [National assessment of flood and coastal erosion risk in England 2024 - GOV.UK](https://www.gov.uk/government/statistics/national-assessment-of-flood-and-coastal-erosion-risk-in-england-2024)

<sup>17</sup> [Beyond 2030 | National Energy System Operator](https://www.gov.uk/government/consultations/beyond-2030-national-energy-system-operator)

<sup>18</sup> [A summary of England’s revised draft regional and water resources management plans - GOV.UK](https://www.gov.uk/government/consultations/a-summary-of-englands-revised-draft-regional-and-water-resources-management-plans)

## 4. Transport

### Institutional Landscape

- 4.1 At a national level, National Highways has responsibility for the Strategic Road Network in the East Midlands including the M1, M42/A42 and M69, the A1, A5, A14, A50, A453 and stretches of the A38, A46 and A52.
- 4.2 Network Rail has responsibility for the rail network and infrastructure. EMR, based in Derby, run most of the train services in the East Midlands under contract to DfT, although a number of other operators also serve parts of the region, including LNER, CrossCountry and Northern.
- 4.3 Following the formal establishment of Great British Railways (GBR) all rail infrastructure and service functions will sit within one organisation at arms-length from the DfT (likely 2027). GBR will have its HQ function located in Derby. The sub-national organisational structure of GBR has yet to be determined.
- 4.4 There are currently ten upper tier authorities in the East Midlands that traditionally have undertaken the statutory roles of Local Transport Authority (LTA) and Local Highway Authority (LHA). These authorities have responsibility for maintaining 98% of the road network and for local public transport, cycling and walking.
- 4.5 In 2024, the new East Midlands Combined County Authority (EMCCA) assumed the role of LTA for Derby, Derbyshire, Nottingham and Nottinghamshire – although the constituent authorities retained their highway functions. The Greater Lincolnshire Combined County Authority will take on the LTA role for Lincolnshire when fully established in 2025.
- 4.6 Transport for the East Midlands (TfEM) brings together the region’s LTAs (and Local Highway Authorities) under the auspices of East Midlands Councils. Birmingham-based Midlands Connect is the designated Sub-National Transport Body covering most of the East Midlands (excluding Northamptonshire which is part of England’s Economic Heartland). TfEM and Midlands Connect have agreed a set of Shared Investment Priorities which are kept under review<sup>19</sup>.
- 4.7 In 2020, TfEM signed a joint funded Collaboration Agreement with DfT to provide local input into the management of rail services run by EMR. This arrangement will formally terminate when EMR is brought into public ownership (likely October 2026) and will not be continued by GBR. Instead, GBR will develop new partnership arrangements with Mayoral Combined Authorities where they exist.

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<sup>19</sup> [Our Shared Vision for the East Midlands](#)

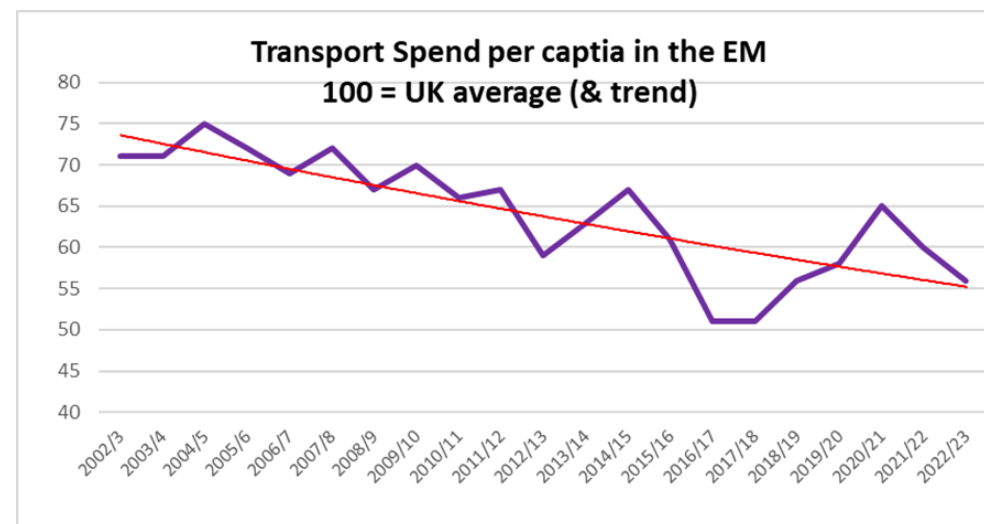
## Overview

- 4.8 The East Midlands plays a crucial role in the UK's economy, acting as a key transport and logistics hub. With the major cities of Nottingham, Derby, Leicester and Lincoln, along with critical freight and logistics networks in the so-called 'golden triangle', the region requires a robust and modern transport infrastructure to fulfil its potential. However, its transport system suffers from persistent underinvestment, outdated systems and inefficiencies that hinder both economic growth and quality of life.
- 4.9 The East Midlands is heavily car dependant with up to 80% of journeys to work made by car<sup>20</sup>. The main strategic routes run on a north-south axis linking London and South East with the major conurbations of the North. East-West connectivity across the region is generally poor.
- 4.10 The 'poly-centric' nature of the region's settlement structure has tended to mitigate against the provision of mass public transport networks outside of Nottingham. Public transport options are therefore generally limited and relatively expensive. As a result, new development has tended to reinforce patterns of car dependency<sup>21</sup>.
- 4.11 The Treasury's PESA analysis demonstrates that transport spend per head in the East Midlands has been significantly below the UK average level for the last 20 years. Transport

<sup>20</sup> [Transport Statistics Great Britain: 2022 Domestic Travel - GOV.UK](#)

spending in the East Midlands has now declined to just 56% of the UK average for 2022/23, the lowest level of any UK region or nation.

- 4.12 These latest figures indicate the disparity in levels of investment spend per head between the East Midlands (£361) and the West Midlands (£694) continue to widen. If the region was funded at a level equivalent to the UK average over the 5 years (2018-19/2022-23), a not unrealistic target, the East Midlands would have received an extra £6bn to spend on transport investment and services.

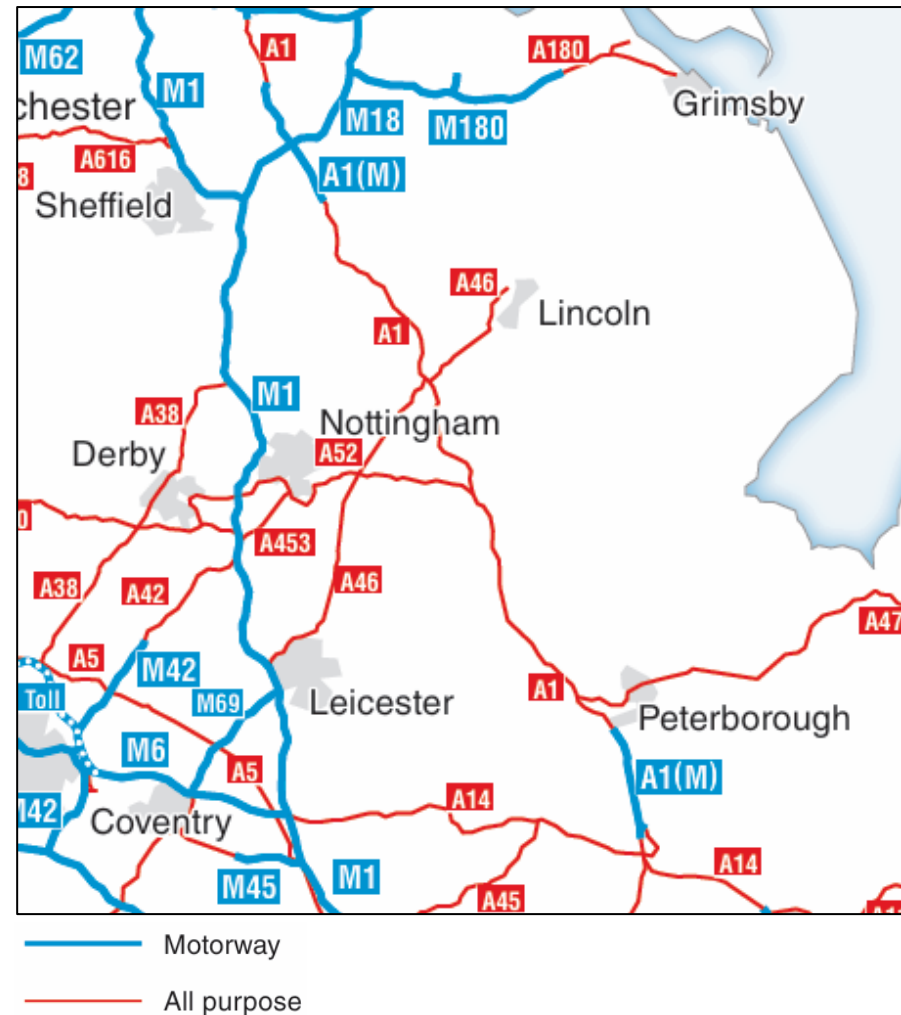


Source: [Public Expenditure Statistical Analyses 2024 - GOV.UK \(www.gov.uk\)](#) & previous releases

<sup>21</sup> [RTPI | The Location of Development 4](#)

### Strategic Roads

- 4.13 Although the Strategic Road Network in the East Midlands is important for both domestic and international connectivity, it suffers from congestion, high traffic volumes and maintenance backlogs. Key corridors, including the M1, A46, and A52, experience significant pressure due to increased demand and developments.
- 4.14 The M1 is one of the busiest motorways in the country, with strategic traffic flows reaching 125,000 vehicles per day in certain sections (e.g., Junctions 24-25). Freight makes up around 15% of this volume, placing additional stress on the network. The high traffic volume results in frequent delays, particularly during peak hours when average queue lengths can extend to 5km during morning and evening rush hours, with delays averaging 20-40 minutes. These delays are exacerbated during periods of adverse weather or accidents, reducing the resilience of the road network and significantly impacting economic activity.



### East Midlands Freeport

East Midlands Freeport is the only inland UK Freeport and has the potential to add £9bn to the economy over the next 25 years, together with the creation of 28,000 jobs. It incorporates the East Midlands Airport and Gateway Industrial Cluster, the East Midlands Intermodal Park and the redevelopment of the Ratcliffe-on-Soar Power Station site.

However, the area has a congested road network and very poor levels of public transport provision. The key to unlocking growth will be improving capacity in and around M1 Junction 24, which is close to capacity and heavily constrained. National Highways have no plans for major investment in the M1 Junction 24 area for the foreseeable future – so a private sector-led solution is being explored.

- 4.15 The East Midlands has a relatively high reliance on road transport, with around 60% of freight transported by road. This reliance on road infrastructure places additional stress on already congested routes. The A1, A5 and A46 in the East Midlands are particularly important from a freight perspective.
- 4.16 The A1 is vital for connections to major ports on the East Coast, including Felixstowe, Grimsby, Immingham and then Dover (via the M25). It also has a key economic role within the East Midlands, particularly for agri-food, logistics, manufacturing and tourism. However, in contrast to the motorway standard sections immediately to the north and south, the A1 through the East Midlands is a dual carriageway

‘A’ road, characterised by sub-standard junctions, right turn movements, accident blackspots and a lack of resilience that suitable alternative routes might provide during closures.

- 4.17 Given the age and condition of the SRN, it is recognised that the balance of future investment by National Highways will shift more towards maintenance and renewals. However, there will still be a need for targeted enhancement schemes to increase capacity to facilitate economic growth and reduce congestion.
- 4.18 The delivery of the A46 Newark Bypass remains a top SRN priority for TfEM. The A46 forms a nationally significant trade route linking the Humber and East Midlands Freeports with Bristol, identified by Midlands Connect as the ‘Trans-Midlands Trade Corridor’. The A46 around Newark from Farndon to the interchange with the A1 and A17 has been a ‘bottleneck’ for many years which causes congestion, pollution and safety issues. A funding decision on the proposed enhancement scheme will be made by the Government following completion of a Development Consent Order inquiry in 2025.

### Local Roads

- 4.19 The strategic road network (SRN) represents only 2% of the network in England. The remaining 98% (186,200 miles) is managed by local authorities. In 2021, 26.3 billion vehicle miles were travelled across 19,900 miles of roads in the East Midlands. Almost all journeys start or finish on local roads, so

realising the benefits of national infrastructure relies on the resilience and effectiveness of the local highway network.

- 4.20 Like any physical asset, the local highway network requires maintenance and renewal to counter deterioration. Planned, preventative maintenance is the most cost-effective method of keeping the road surface in good repair. However, roads generally decline over time, so the implications of underinvestment are not immediately obvious. This has made it an easy target for savings as local government revenue funding fell by 25% between 2010 and 2019. Funding provided by the DfT for local road maintenance in 2021/22 was less than £1.4bn, 0.3% of its total asset value of £400bn. This is simply not sufficient.
- 4.21 The current system of allocating capital spending to Local Transport Authorities is based around annually agreed allocations for maintenance and renewals and a bidding process for funding to deliver major schemes. This approach does not facilitate the long-term approach to growth and infrastructure investment necessary to secure the Government's core missions. TfEM has proposed that government should commit to rolling five-year capital allocations for Local Transport Authorities consistent with previous recommendations made by the NIC<sup>22</sup>.

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<sup>22</sup> [Infrastructure, Towns and Regeneration - NIC](#)

### Local Strategic Road Links

The Cross Keys Swing Bridge at Sutton Bridge, carries the A17 linking Lincolnshire and Norfolk. Constructed in 1897, it is a Grade II listed structure that was not designed for the volume and weight of today's traffic. Replacing the bridge would cost £100m, so Lincolnshire County Council has opted for incremental maintenance and targeted upgrades, despite the high cost of maintenance that must adhere to the strict regulations aimed at retaining its historic and architectural character. This places a major strain on the council's already stretched maintenance budgets.

The same squeeze on maintenance budgets is causing major problems for Derbyshire County Council in maintaining roads prone to landslips. The council currently has some 200 landslips across its network that it is trying to manage. The Snake Pass, which carries the A57 between Sheffield and Manchester, is one road that faces potential closure. Traffic lights have been installed at Cupit for safety reasons because the council does not have the resources for a full repair.

### Rail

- 4.22 The East Midlands does not have an extensive rail network compared to London or other provincial metropolitan areas such as the West Midlands or Greater Manchester. There are only 108 stations in the East Midlands serving a population of 5m. Less than 17% of the region's population live within a 20-minute walk of a rail station. In addition, 75% of stations in the

region are served by just one train an hour of fewer, with even lower levels of service on Sundays and increasingly overcrowded trains on Saturdays<sup>23</sup>.

4.23 Consequently, rail in the East Midlands is poorly used. On average each person in the region uses the train around seven times a year (half the amount than in the West Midlands) and the East Midlands has the lowest rate of station usage per head in England.

4.24 Even in its current state, however, rail has a critical role in supporting people, the economy and reducing the impacts of travel on the environment. Evidence from TfEM suggests that rail services in the East Midlands are directly worth around £356m per year to our regional economy - including the time it saves people who may otherwise drive. To this should be added the £5.8bn per year that the Rail Delivery Group estimates rail services and users generated for the East Midlands through wider economic activity.

4.25 Following cancellation of HS2, The Midland Main Line (MML) will remain the backbone of the Region's rail network and has a nationally significant role linking London St. Pancras and Sheffield, with a branch to Nottingham. It also provides important connectivity to Leicester, Derby, Loughborough, Chesterfield, Corby and to the North of England.

4.26 The line supports a variety of both local commuter and inter-city services. East Midlands Railway operate intercity services between Sheffield/Nottingham and London, as well as 'EMR Connect' services between Corby and London via Kettering, and a regional link from Leicester northwards to Nottingham and beyond. Thameslink operate services to Bedford on the southern section of the route.

4.27 Unlike the East and West Coast Main Lines, the MML is not fully electrified. Electrification only extends between London and Bedford, Kettering and Corby. Further electrification of the route to Wigston South Junction (south of Leicester) has recently been procured by Network Rail and is currently being delivered. Although the Government has committed to the full electrification of the line to Sheffield, there is currently no firm completion date or identified funding.

4.28 The East Coast Main Line also serves the region and is quicker and cheaper for many journeys to London, Leeds, Newcastle and Scotland, but only directly serves the towns of Grantham, Newark and Retford in the East Midlands.

4.29 In terms of rolling stock, the East Midlands will benefit from state-of-the-art diesel-electric bi-mode inter-city Class 810s (Aurora) trains, which will be introduced on the Midland Main Line from late 2025. When fully deployed the new fleet will

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<sup>23</sup> [A-Platform-for-Growth.pdf](#)

increase the number of available seats on the route by up to 40%.



Auroa Class 810 Bi-Mode Inter-City Train

- 4.30 Fully electric Class 360 commuter trains operate between Corby and London and are due to be refurbished shortly.
- 4.31 EMR's regional fleet is made of Class 170 and Class 158 diesel trains, which are also in the process of refurbishment to extend their life for at least a further decade. However, a longer-term regional rolling stock strategy is required. Battery

<sup>24</sup> [First of many battery trains enter service in Germany - Trains](#)

<sup>25</sup> [Ireland to Purchase 90 Battery-Electric Train Carriages from Alstom | Railway-News](#)

electric bi-mode trains are currently being deployed in Germany<sup>24</sup> and Ireland<sup>25</sup> and appear to offer an attractive low carbon option for the East Midlands providing electrification of the MML is completed.

### **Bus and Light Rail**

- 4.32 Bus usage is very low in the East Midlands and inflated by the exceptionally high levels in Nottingham City, which is second in bus usage only to Brighton (and London). The average person in the East Midlands makes 29 bus journeys per year, compared with 45 in the West Midlands and 190 in London<sup>26</sup>.
- 4.33 The Nottingham Express Transit (NET) is the Region's only light rail system. There are currently two lines in operation with 50 stops across the conurbation including the Queens Medical Centre, Nottingham Midland Station and seven Park & Ride Sites. Annual ridership was 15.5m in 2023-24<sup>27</sup>, an increase on the previous year but still below the pre-pandemic peak. Potential extensions to the system will be considered by the East Midlands County Combined Authority.

<sup>26</sup> [bus01.ods](#)

<sup>27</sup> [Light rail and tram statistics, England: year ending March 2024 - GOV.UK](#)

### **International Gateways**

- 4.34 East Midlands Airport (EMA) is home to the UK's largest dedicated air cargo operation, making it the country's most important airport for express freight. EMA is a hub for DHL, UPS, FedEx and Royal Mail. EMA is a four-hour truck drive to 90% of the population of England and Wales. Unique among its competitors, it benefits from unrestricted night flights.
  
- 4.35 EMA's passenger operation is focussed on the low-cost market, currently serving 72 destinations and carrying over 4m passengers a year.
  
- 4.36 EMA directly employs over 800 people and supports a total of 7,800 jobs on site. Public transport access to EMA is limited to bus services, some of which are operated by local employers. The nearest rail station is East Midlands Parkway which is five miles away and on the other side of the M1 motorway. As a result, EMA is very car dependant, which is a challenge given the contained nature of the strategic and local road network in the area.
  
- 4.37 Boston in Lincolnshire is the Region's only coastal port. The Port of Boston is located on the Wash and serves a wide hinterland. The Port is rail connected and has an active daily steel train service to the Victoria Group Steel Terminal in the West Midlands.
  
- 4.38 However, the region's economy benefits significantly from the proximity of the much bigger Humber ports of Immingham,

Grimsby, Goole and Hull, which together handle around 17% of the nation's trade and play a vital strategic role for the UK as a global trade gateway. These ports also comprise the Humber Freeport designation. The M/A180, A46 and A15 are key access routes into the Humber Ports from the East Midlands.



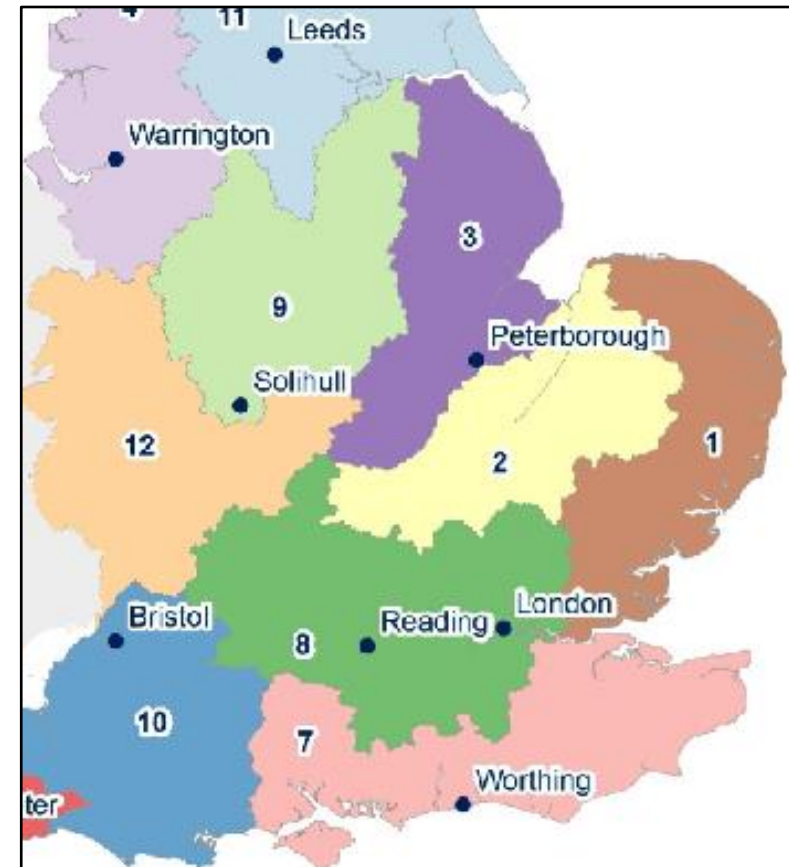
East Midlands Airport Freight Hub

## 5. Flood Risk Management

### Institutional Landscape

- 5.1 Flood Risk Management in England falls under the remit of the Department of Environment, Food & Rural Affairs (Defra) with delivery led by the Environment Agency. The Environment Agency has a strategic overview of all sources of flooding and coastal erosion as defined in the Flood and Water Management Act 2010 (WFMA). It is also responsible for flood and coastal erosion risk management activities on main rivers and the coast, regulating reservoir safety and working in partnership with the Met Office to provide flood forecasts and warnings. It must also look for opportunities to maintain and improve the environment for people and wildlife while carrying out its duties.
- 5.2 Under the FWMA 2010, county councils and unitary councils are designated as Lead Local Flood Authorities. These authorities (of which there are ten in the East Midlands) lead on managing local flood risks, including flooding from surface water, ground water and ordinary (smaller) watercourses. Responsibilities also include a duty to maintain a strategy for local flood risk management, to maintain a register of flood risk assets, to investigate significant local flooding incidents and publish the results of such investigations.
- 5.3 Regional Flood and Coastal Committees (RFCCs) were established by the Environment Agency under the FWMA 2010. RFCCs guide flood and coastal erosion risk management activities within their river catchments and along the coastline.

RFCCs bring together members appointed by Lead Local Flood Authorities (LLFAs) and independent members with relevant experience. There are 12 committees in England and each has a chair appointed by Defra. There are two RFCCs covering the East Midlands: Anglia Northern (based in Peterborough) and Trent (based in Solihull).



Regional Flooding & Coastal Committee Boundaries

5.4 In some parts of the East Midlands Internal Drainage Boards (IDBs) also build and maintain flood defences. IDBs are public bodies responsible for managing water levels and can levy charges on councils. Boston Borough Council handed over £2.5m of the £4.2m it collected in council tax in 2023/24 for the IDB levy – around 60%. Many Lincolnshire authorities have also seen major increases over the last two years, with East Lindsey’s bill increasing by £1.3m – the highest rise in the country.

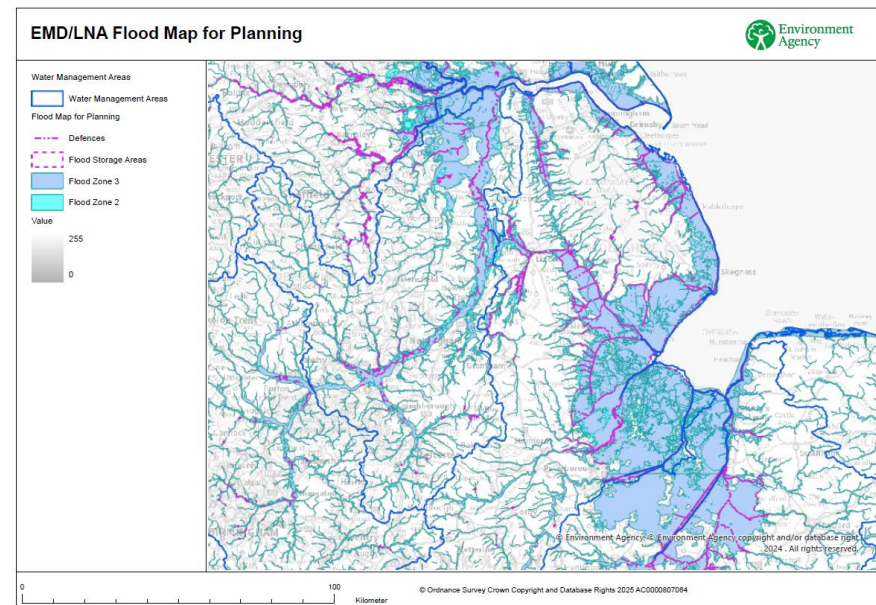
**The Scale of Flood Risk**

5.5 In December 2024, the Environment Agency published an updated National Assessment of Flood & Coastal Erosion Risk in England<sup>28</sup>. The Assessment highlighted that the East Midlands has the greatest share of properties at risk of flooding from rivers or the sea in England (18.4% - 127,500), and the highest proportion of properties at risk of any English Region (4.6%). These figures are exacerbated by a very significant increase in the number of properties at high or medium risk of surface water flooding.

5.6 The Environment Agency’s assessment is consistent with research published by East Midlands Councils in 2015 that was informed by analysis commissioned from the Met Office, which concluded that ‘*the East Midlands region has the*

*highest exposure to increases in flood risk due to climate change in England*<sup>29</sup>.

5.7 In addition to large expansive areas of low-lying land on the Lincolnshire Coast, the river systems of the Trent, Derwent, Soar, Witham and Nene drain through the region’s most heavily built-up areas, many of which were historically developed around river crossings.



Flood Risk Areas in the East Midlands (© Environment Agency)

<sup>28</sup> [National assessment of flood and coastal erosion risk in England 2024](#)

<sup>29</sup> [The-Changing-Nature-of-Flooding.pdf](#)

5.8 Climate warming contributes to rising sea levels and to more extreme weather events. Even if the rise in global temperatures can be limited to 1.5°C above pre-industrial levels, these climate impacts are likely to become more severe over the coming decades – which could increase the number of properties at risk by a third, as well as the depths to which properties flood<sup>30</sup>.

### Recent Flooding Events

5.9 Major flooding events have occurred with increasing regularity in the last 20 years. All counties and cities in the region have been directly affected. Storm Babet (October 2023) and Storm Henck (January 2024) inflicted considerable damage across the region (including the loss of life), the impacts of which is still being felt in many communities.

5.10 The January 2025 flooding events appear to have resulted from a combination of rapid snowmelt and a period of extended heavy rain. The impacts were particularly acute across Leicestershire<sup>31</sup> and Lincolnshire<sup>32</sup>, which both declared Major Incidents, and in parts of Nottinghamshire.

- In Leicestershire, 800 homes and businesses and 160 roads were flooded, with over 60 people rescued from properties and 27 from vehicles.

- Over 100 homes were flooded in Lincolnshire, some of which were also flooded in the 2023/24 storms, along with numerous local road closures.
- The A1 was closed between Newark and Grantham for an extended period due to flooding causing extensive local congestion; and Midland Main Line train services were disrupted due to flooding near Long Eaton.
- Sections of the A52/A60 were closed for a period and the Queens Drive Park & Ride in Nottingham was closed for nearly three weeks.



Flooding in Charnwood January 2025

<sup>30</sup> [March 2023 Progress in adapting to climate change 2023 Report to Parliament](#)

<sup>31</sup> [Hard-hitting letter presses Government to release flooding cash | Leicestershire County Council](#)

<sup>32</sup> [More investment is needed to protect Lincolnshire from flooding – Lincolnshire County Council](#)

5.11 Flooding can cause significant economic damage to people, businesses, landowners and infrastructure.

5.12 Following the flooding caused by Storms Ciara and Dennis in 2020, the Association of British Insurers estimated that the average insurance claim per household was £32,000. The Environment Agency has estimated the total economic damages for all floods between January 2016 and November 2019 in England and Wales was between £504m and £924m, with a best estimate of £708m at 2024 prices<sup>33</sup>.

5.13 Research also shows that flooding can have severe long-lasting mental health consequences for those affected, including depression, anxiety and post-traumatic stress disorder (PTSD)<sup>34</sup>.

### **Insurance**

5.14 Access to affordable insurance for people and businesses at risk of flooding is critical to maintaining economic viability and investor confidence.

5.15 The 'Flood Re' scheme is a joint initiative between the Government and insurers<sup>35</sup>. Its aim is to make the flood cover part of household insurance policies more affordable. The funding comes from three sources – a Levy, a premium and an

excess – all of which are paid by insurers (and ultimately consumers). In establishing the scheme, the Government also committed to long-term public investment in flood defences.

5.16 Flood Re was introduced in 2016 and will run until 2039, at which point insurers should be offering policies based on actual risk to property. Flood Re has represented a lifeline to many communities impacted by flooding, but it does not apply to properties built after 1 January 2009 (which should be located outside of identified flood risk zones) or to most businesses.

5.17 Without access to affordable insurance, there is a danger that vulnerable places will lose their vitality and those that are able to leave, will do so – as is starting to happen in parts of Australia impacted by repeated floods in recent years.

### **Investment in Flood Risk Management**

5.18 Between 2021 and 2027, it is estimated that £630m will have been invested by the Environment Agency and other authorities in flood risk management, better protecting 25,000 properties across the East Midlands.

5.19 Significant projects delivered to date include:

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<sup>33</sup> [Insurance pay outs to help customers recover from Storms Ciara and Dennis set to top £360 million | ABI](#)

<sup>34</sup> [The English National Cohort Study of Flooding & Health: psychological morbidity at three years of follow up](#)

<sup>35</sup> [Flood Re - A flood re-insurance scheme](#)

- **Boston Barrier:** This project, combined with other investment along the Boston Haven, offers protection against a 1 in 300 (0.33% AEP) chance of a tidal flood event happening. The benefits of the scheme include significantly reduced tidal flood risk for over 17,000 properties (including more than 700 commercial properties and delivery of up to £1,989m of direct benefits - excluding indirect benefits).
- **Saltfleet to Gibraltar Point:** This is the UK's largest and longest running coastal defence scheme which is managed by the Environment Agency and reduces the flood risk to 40% of Lincolnshire. Annual beach nourishment sustains the current standard of protection, as part of a much longer-term strategy to provide flood risk management for the area.
- **Derby Our City Our River (OCCUR):** comprises multiple packages of projects called the Munio projects. It has a dual purpose of reducing flood risk whilst creating a high quality riverside, linking Derby city centre with the River Derwent. The initial package from Darley Abbey to the Silk Mill was commenced in 2015. To date, 1,200 properties are better protected from the works completed.

5.20 Significant projects planned or currently under construction include:

- **Lowdham:** Construction of the new flood storage reservoir will better protect almost 200 properties from flooding and provide £50m of benefits to the local area and local economy. The area has had a long history of frequent floods over the past 25 years.
- **Derby Our City Our River (OCCUR):** Planning for the next phase of flood alleviation measures at Derby Riverside has been submitted, which covers the east bank of the River Derwent from Causey Bridge to Derwent Bridge. The new flood defences will better protect a further 670 properties from flooding, taking the overall programme closer to the target of protecting over 2,000 properties.

5.21 Analysis by the National Audit Office<sup>36</sup> highlighted that the East Midlands receives close to the lowest level of funding per property at risk at £3,227, despite the region's high level of inherent risk. This compares unfavourably to the North East, which receives almost four times as much at £12,563 per property, and the North West, at £10,204.

5.22 A 2024 report by the Public Accounts Committee highlighted that the impact of construction inflation and scheme delays would significantly erode the effectiveness of planned investment by the Environment Agency over coming years<sup>37</sup>. The report also highlighted that lack of investment in existing assets is also increasing risk to communities. This is

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<sup>36</sup> [Resilience to flooding](#)

<sup>37</sup> [Flood resilience eroded by poorly maintained defences with Government in the dark on progress - Committees - UK Parliament](#)

exacerbated by the investment associated with new housing development, where developers may be obliged to contribute to new flood defences but subsequent responsibilities and liabilities for ongoing maintenance are passed onto the Environment Agency and Local Authorities.

- 5.23 Public investment in flood defences requires a very strong business case (typically a BCR of more than 9 to 1) and a local partner contribution. This funding model makes delivering flood defences in areas with low land values (including Grade 1 Agricultural land) more challenging. There are often good social, economic and environmental reasons to protect local areas, but the investment methodology may preclude this. While the Government might expect the partnership model to ‘stretch’ public funding, in practice it can cause schemes to stall before any real momentum has been gained.

#### **The Natural Flood Management Programme**

- 5.24 Natural flood management (NFM) uses natural processes to reduce the risk of flooding. These processes protect, restore and mimic the natural functions of catchments, floodplains and the coast to slow and store water. NFM measures can include:
- soil and land management
  - river and floodplain management
  - woodland management
  - run-off management
  - coast and estuary management

- 5.25 NFM can also provide wider benefits including:
- enhancing habitats and biodiversity
  - improving water quality and availability of drinking water
  - improving carbon capture
  - boosting health and wellbeing

- 5.26 In September 2023, the Environment Agency and Defra announced £25m funding for improving flood resilience through a new NFM programme. Out of the 34 project business cases that are complete, three NFM projects are in the East Midlands.
- Leicester City Council: Leicester Urban NFM – Willow Brook catchment
  - Lincolnshire County Council: Barrow Beck chalk stream restoration
  - Lincolnshire County Council: Building Flood Resilience in the River Rase catchment

- 5.27 Sustainable Urban Drainage Systems (SuDS) can also help to reduce the risk of surface water flooding and create natural habitats with community benefits - but require regular maintenance. Schedule 3 of the Flood and Water Management Act 2010 made provision for ‘Lead Local Flood Authorities’ (county and unitary authorities) to establish SuDS Approval Bodies to ensure long-term maintenance arrangements for all new schemes. However, successive governments have failed to implement these powers. We call for Schedule 3 of the Flood and Water Management Act 2010 to be implemented.

### **The Way Forward**

- 5.28 The scale and impact of climate change and sea level rise is such that our historic approach of building large-scale concrete defences will have to change. The East Midlands will have to become more resilient as a region.
- 5.29 We need to protect the properties and the vital infrastructure of the East Midlands from flooding. We need to maintain flood risk management assets to an agreed standard of protection. This will require a shift in funding away from ‘new’ to ‘maintain’ and it will be necessary to assess how climate change will impact on the flood and coastal risk management assets’ performance and resilience.
- 5.30 Whilst investment in existing assets can maintain the current standard of protection to properties, other measures - for example natural flood risk management and catchment-based flood risk management - may be required to provide head room for climate change. Property level resilience measures may become more necessary as inflation and duration of construction delivery leave properties undefended.
- 5.31 We need to recognise that climate warming will continue to contribute to rising sea levels and to more extreme weather events, the scale of which can overwhelm drainage systems and flood defences that were built consistent with previous understandings of risk. These climate impacts are likely to become more severe over the coming decades. Given projected sea level rise, there may come a point when radical

interventions will be required in parts of the region to keep communities safe.

## 6. Energy Supply

### Background

- 6.1 Our energy system is still largely based on fossil fuels, such as natural gas and contributes to climate change. In 2021, around 30% of UK greenhouse gas emissions came from generating electricity and heating buildings. Electric vehicles, heat pumps and increased insulation can help businesses and households reduce energy demand, but energy generation itself also needs to be decarbonised and enhanced to meet growing demand.
- 6.2 Historically known as ‘Megawatt Valley’, the 13 coal-fired power stations of the lower Trent Valley generated up to a quarter of power demand for England and Wales. The redevelopment of now closed power station sites, the transmission infrastructure that surrounds them, and new clean energy provide opportunities for the East Midlands to drive net zero power generation and transmission<sup>38</sup>.
- 6.3 The East Midlands Infrastructure Partnership supports the ambition set out in the Midlands Engine Energy Security White Paper published December 2024<sup>39</sup>. In the short-term however, the East Midlands APPG noted that new developments and businesses often struggle to secure grid connectivity, even when renewable energy is being locally generated – which is hugely frustrating for communities<sup>40</sup>.

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<sup>38</sup> National Infrastructure Commission Energy & Net Zero report Dec 2024

<sup>39</sup> [Midlands-Engine-Energy-Security-White-PaperDev12WEB-1.pdf](#)

### Institutional Landscape

- 6.4 The National Energy System Operator (NESO) has been established to work alongside Great British Energy to deploy renewable energy. NESO is responsible for planning Great Britain’s electricity and gas networks, operating the electricity system and creating insights and recommendations for the future whole energy system. Great British Energy has been launched to invest in clean, home-grown energy.
- 6.5 NESO will lead the development of Regional Energy Strategic Plan (RESP) for the East Midlands that will enable the coordinated development of the energy system across multiple vectors, provide confidence in system requirements and enable network infrastructure investment ahead of need. This will support the energy system’s transition to net zero in a cost-effective manner.
- 6.6 In addition to NESO, the North Sea Transition Authority licenses, regulates and influences the UK oil and gas, offshore hydrogen, and carbon storage industries, and the UK Atomic Energy Authority (UKAEA) regulates and controls nuclear energy, including the development of new nuclear energy projects.
- 6.7 These energy bodies must comply with national and local regulatory and planning processes that create checks and balances in the roll-out of renewable energy. Nationally Significant Infrastructure Projects (NSIPs), introduced under

<sup>40</sup> [East Midlands APPG REPORT 2023](#)

the Planning Act 2008, streamline the consenting process for big infrastructure schemes whilst local planning authorities check that smaller projects satisfy community needs.

### **Energy Generation & Major Users**

- 6.8 NESO has said there are two pathways towards the government’s goal of generating more low-carbon electricity than we consume. The first relies heavily on a surge of new renewable energy projects, including plans to more than triple the UK’s offshore wind capacity to 50 gigawatts in the next six years. The second path depends on extending the life of existing nuclear reactors and building new ones, alongside gas plants fitted with carbon capture technology.
- 6.9 In both pathways the UK needs to double onshore wind capacity from 13GW in 2023 to 27GW by 2030 and triple its solar power from 15GW to 47GW.
- 6.10 Under both scenarios, the UK would continue to use gas-fired power stations to generate electricity when renewable or stored electricity is unavailable – but this would make up less than 5% of the country’s power consumption<sup>41</sup>.
- 6.11 The second National Infrastructure Assessment found that electricity demand in Great Britain will increase by around 50% by 2035. A 35% annual rise in heat pump installations is needed to decarbonise 7m buildings and a 30% annual growth

in deployment is needed to deliver 300,000 public EV charging points<sup>42</sup>.

- 6.12 In 2020, data centres in the UK consumed up to 35 TWh of electricity. The Government’s new AI Opportunities Action Plan places further demand on supply. NESO estimates that high levels of development in AI and off-site computation are expected to increase data centre electricity demand by fourfold from today to 2030.

### **Grid Capacity**

- 6.13 As the climate crisis becomes ever more urgent, the shift from fossil fuels to renewables is a vital part of the UK’s mission to meet net zero targets. In 2021, the government committed to fully decarbonising the grid by 2035.
- 6.14 Nationally, consumption is projected to double by 2050. Only so much can be done with a power system that evolved in a different era. As our reliance on fossil fuels is replaced with renewable energy, generated in large parts by offshore wind farms as well as solar, significant new distribution and transmission infrastructure is needed to connect that renewable energy from where it is generated to where it is needed.
- 6.15 National Grid has embarked on “The Great Grid Upgrade<sup>43</sup>” - the largest overhaul of the UK’s electricity grid in generations

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<sup>41</sup> Guardian report 5th November 2024

<sup>42</sup> Second National Infrastructure Assessment

<sup>43</sup> <https://www.nationalgrid.com/the-great-grid-upgrade/big-bright-future>

and is made up of 17 major infrastructure projects. New or improved power lines, substations, underground and underwater cables and other infrastructure will increase the grid's capacity to transmit clean electricity more efficiently across the country.

6.16 Great Grid Upgrade projects in the East Midlands include:

- **Grimsby to Walpole:** 140km long, 400kv overhead line on 50m high pylons. Including new substations at Grimsby West, Bilsby, Weston Marsh and Walpole<sup>44</sup>.
- **North Humber to High Marnham:** upgrade to existing 400kv overhead line.
- **Chesterfield to Willington:** 60km long, 400kv overhead line on 50m high pylons. Including a new 400kv substation at Chesterfield. Additionally, the existing Brinsworth to High Marnham line will be upgraded from 275kv to 400kv.
- **Eastern green Links:** two new offshore high voltage electricity links and associated onshore infrastructure to link Scotland and England. The links would transport enough clean energy from Scotland to power up to 4m homes in the Midlands and South of England. The proposed onshore elements would be in the districts of East Lindsey, Boston and South Holland in Lincolnshire, and King's Lynn in Norfolk.

6.17 Complementing the Great Grid Upgrade, giant undersea interconnector cables laid across the Channel and North Sea

are making it easier to trade electricity to get the best supply and price. The new £1.7bn Viking Link interconnector, joining Lincolnshire and southern Jutland in Denmark, can transport enough electricity to power 2.5m UK homes and will bring more than £500m in savings for UK consumers in its first 10 years.

6.18 A number of these proposals are controversial locally because of the visual and environmental impacts of major new infrastructure in predominately rural areas. Local government in Lincolnshire and Norfolk are particularly concerned about the impact of the Grimsby to Walpole overhead line on the visitor economy and wish to see this section underground<sup>45</sup>.

#### **Transition to Net Zero: Solar**

6.19 In March 2024, the UK's installed solar capacity was 15.8GW. The government's goal is to increase this to 70GW by 2035. A large number of significantly sized solar farms are currently being built or are planned across the East Midlands. As an example of the scale of this transition, in Lincolnshire there are currently seven major solar farms classed as Nationally Significant Infrastructure Projects (NSIP) in the planning process. A further major site straddles the Lincolnshire – Nottinghamshire border (One Earth Solar). Together they would increase installed capacity by 24.4%

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<sup>44</sup> [download](#)

<sup>45</sup> [National Grid decline to share detailed pylon costs, council says - BBC News](#)

Springwell Solar	800MW	One Earth Solar	740MW
Burton Energy Park	500MW	Tillbridge Solar	500MW
Beacon Fen Solar	400MW	Mallard Pass Solar	350MW
Fosse Green Solar	320MW	Temple Oaks Solar	240MW

6.20 Solar farms cover a large land area. The Springwell site extends over 4,200ha. The loss of farmland and fears about the ‘industrialisation’ of the countryside are the main concerns of local communities and councils across the region<sup>46</sup>.

#### **Transition to Net Zero: Onshore Wind**

6.21 The Government has announced that onshore wind projects above 100MW in England will be reintroduced into the NSIP regime from spring 2025.

6.22 An Onshore Wind Industry Taskforce has been established. Challenges include identifying sites taking account of population, environmental and other factors. Financial viability is primarily driven by wind speed. Sites on windy mountaintops have the lowest energy costs in the world, but much of lowland UK is unviable without heavy subsidies. The only two sites currently in the planning process in England are on the Pennines near Rochdale and Hebden Bridge.

<sup>46</sup> [Two more huge solar farms ‘a slap in the face’ for Lincolnshire – Lincolnshire County Council](#)

#### **Transition to Net Zero: Offshore Wind**

6.23 The Outer Dowsing offshore wind farm, located 54km off the Lincolnshire Coast, is classed as a NSIP currently in the planning process. It will generate 1.5GW of renewable electricity, equivalent to the annual electricity consumption of over 1.6m households and will play a critical role in achieving the UK Government’s ambition to deliver 50GW of offshore wind by 2030.

6.24 Underground transmission cables will come ashore to the north of Chapel St Leonards and connect to a substation to the north of Spalding.

#### **Transition to Net Zero: Energy Storage**

6.25 Both solar and wind power are susceptible to the weather. Energy storage is therefore important in maintaining a consistent supply. A few storage systems are available, and others are under development.

6.26 Pumped hydro storage has been used by National Grid for many years by pumping water into reservoirs when demand is low and releasing it to generate power when needed.

6.27 Hydrogen can be stored underground and used to generate power when needed. Gas-fired power stations can be converted to hydrogen. Cadent is exploring geological hydrogen storage potential in the East Midlands (EMstor). See *Hydrogen section below*.

- 6.28 Battery energy storage systems (BESS) use lithium-ion batteries to store electricity. In 2017, South Derbyshire District Council approved a 40MW 'Energy Barn' at Breach Farm, Swadlingcote which became the first to deliver electricity to National Grid's Balancing Mechanism. In 2022, EDF commissioned a 50MW energy storage system connected to the high-voltage transmission network at Willington, Derbyshire.
- 6.29 The roll-out of BESS is continuing: High Peak Borough Council has approved a battery storage system at the New Mills Substation capable of storing sufficient power for 10,000 homes.

**Cross Sector Opportunity: Cleaner Transportation**

Lithium-ion batteries offer the opportunity to reduce CO2 emissions, across public transport and haulage, as well as private cars.

Leicester now has over 150 electric buses in operation - over half its total fleet<sup>47</sup>. In 2024, Nottingham City Transport began the roll-out of 62 electric buses with 24 entering service in May 2024 and a further 38 due in 2025. The buses have a range of up to 275 miles, enough for a full day service.

Take-up of electric cars is encouraging, with about 1.1m fully battery-powered cars on British roads and about 63,000 charging units in 33,000 locations, according to Zapmap data (2024).

The haulage industry is further behind, with just 300 electric HGVs registered out of the country's 500,000 strong lorry fleet, according to the Road Haulage Association. However, Amazon have just placed a major order for an expanded fleet of electric HGVs with a single-charge range of 500km<sup>48</sup>

**Transition to Net Zero: Hydrogen**

- 6.30 East Midlands Hydrogen is the UK's largest inland hydrogen cluster<sup>49</sup>. Plans for regional hydrogen production, distribution and industrial use are gathering momentum. Twenty East

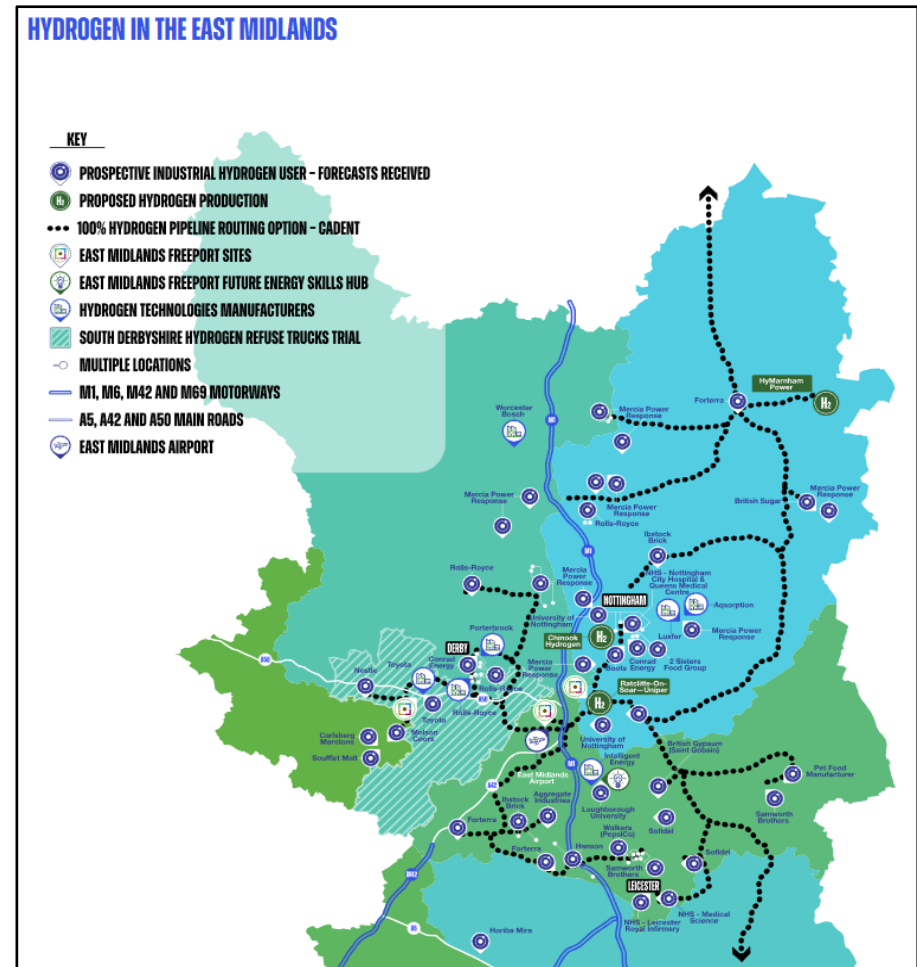
<sup>47</sup> [electric — Leicester Buses](#)

<sup>48</sup> [Amazon places the UK's biggest-ever order of electric trucks, and moves onto Britain's electric railways - UK Press Centre](#)

<sup>49</sup> <https://eastmidlandshydrogen.co.uk>

Midlands manufacturers including Boots, Rolls Royce and Toyota have produced forecasts for switching from gas to hydrogen, with a forecast combined demand of 10TWH hydrogen per year. This would save 1.9m tonnes of CO2 annually.

- 6.31 Hydrogen production forecasts total 650MW production capacity by 2050, making use of coal fired power station sites and Megawatt Valley electricity infrastructure. Plans for the redevelopment of the Ratcliffe Power Station site include a 500MW green hydrogen project to be constructed by 2030 by German utility company, Uniper.
- 6.33 Cadent is designing a 100% hydrogen pipeline for the East Midlands region, connecting power to demand. Subject to support from the Government and Ofgem, Cadent is targeting a 2029-2031 pipeline construction timeline.
- 6.34 The economic impact of East Midlands Hydrogen is estimated at £10bn gross added value with 110,000 jobs created or protected.



Potential hydrogen pipelines linking production to industrial users

Source: <https://eastmidlandshydrogen.co.uk>

### **Transition to Net Zero: Carbon Capture & Storage**

- 6.35 Carbon capture and storage (CCS) is a key part of the UK's plan to achieve net zero emissions by 2050. So far, the Government has announced a significant £22bn investment in two CCS projects, in Merseyside and Teesside.
- 6.36 A CCS project for the Viking area of the southern North Sea is awaiting a decision by the Secretary of State to allow construction to commence in 2025<sup>50</sup>. Onshore facilities would be built at Theddlethorpe on the Lincolnshire coast. The Viking project can provide an initial storage capacity 300m tonnes of CO<sub>2</sub> with 10m tonnes per year being captured by 2030. The CO<sub>2</sub> will be stored by pumping into depleted gas wells. The project aims to capture, transport and store 50% of Humber emissions.
- 6.38 Agreements have been signed to connect both the West Burton B and RWE Staythorpe Combined Cycle Gas Turbine Plants to Viking CCS in future phases.

### **Transition to Net Zero: Nuclear Fusion**

- 6.39 In January 2025, the Government announced five bids to build a fusion power plant on the site of the former West Burton coal-fired power plant near Retford. Funding of £410m for the coming year was also announced.

- 6.40 Nuclear fusion is carbon-free at the point of generation. By harnessing the process that powers the Sun and stars, fusion has the potential to provide a safe, abundant source of low carbon energy. Building a commercial fusion plant, known as STEP (Spherical Tokamak for Energy Production), is the responsibility of UK Industrial Fusion Solutions (UKIFS), a UK Atomic Energy Authority subsidiary. Although STEP is currently 100% Government funded, UKIFS will establish and lead a public and private alliance to deliver the programme. The project aims to demonstrate net energy from fusion in the 2040s.

### **Transition to Net Zero: Small Modular Reactors**

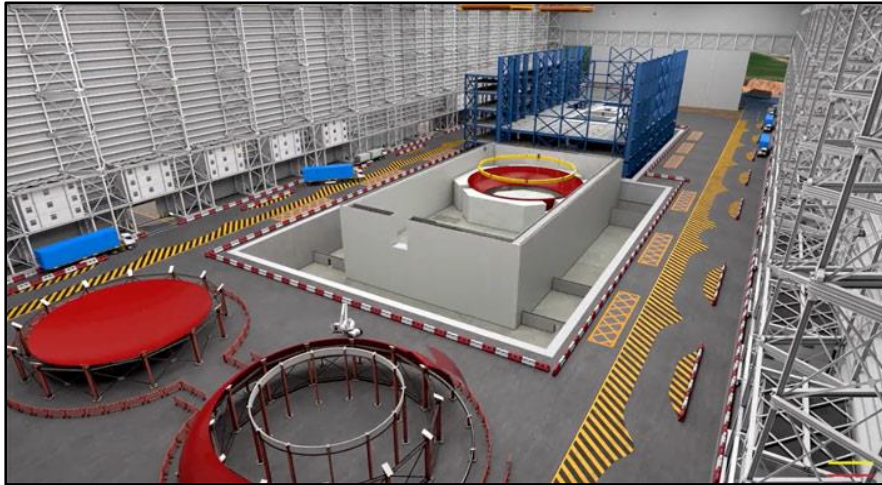
- 6.41 Small Modular Reactors (SMRs) are smaller nuclear reactors that can be built in factories and are intended to help the UK meet its energy needs. The Government aims to deploy the first SMR by the early 2030s.
- 6.42 SMRs are cheaper to build than large reactors because they can be manufactured in factories, avoiding the high upfront costs of building on-site. They can be built faster and deployed more flexibly than large reactors.
- 6.43 Great British Nuclear is currently negotiating with four companies: GE Hitachi, Holtec, Rolls Royce SMR and Westinghouse, with final decisions to be taken in the spring.

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<sup>50</sup> [www.vikingccs.co.uk](http://www.vikingccs.co.uk)

### Rolls Royce SMR

Rolls Royce is a major East Midlands employer. Circa 600 staff at Derby, Warrington and Manchester are currently working on its SMR programme. A Rolls-Royce SMR power station will have the capacity to generate 470MW of low carbon energy, which is more than 150 onshore wind turbines. The Rolls-Royce SMR programme is forecast to create 40,000 UK jobs by 2050 and £52bn in economic benefit.



### Transition to Net Zero: Geological Disposal of Nuclear Waste

- 6.44 Nuclear Waste Service (NWS), a subsidiary of the Nuclear Decommissioning Authority, is currently looking at two sites for a potential Geological Disposal Facility (GDF). One of those sites is near Theddlethorpe, Lincolnshire.
- 6.45 Nuclear power is considered essential to the transition to net zero. The safe and secure long-term storage of nuclear waste is becoming increasingly important. Countries such as Canada, Finland, France, Sweden and Switzerland share the view that a GDF should be the chosen method of storage.
- 6.46 A GDF would require the construction of shafts and tunnels to store nuclear waste some 200 - 1000m underground over an area of approximately one square mile. Lincolnshire has been selected as a potential site because of its unique geology. A layer of clay over 300m thick lying deep beneath the surface provides a natural radiation shield and is ideal for tunneling. Offices, laboratories and processing facilities would be required at the surface together with a new rail link to bring nuclear waste to the site.
- 6.47 NWS estimates that more than 4,000 jobs, mostly local, would be created within the first 25 years. As the site will be operational for circa 175 years it will have a major economic impact. The process of finding a site could take 15 - 20 years.

## 7. Water Supply & Quality

7.1 In a country where rainfall is assumed to be plentiful, resilient water supplies are taken for granted. As the climate changes and populations grow, that resilience is being tested.

7.3 The Environment Agency estimates that by 2050, there will be a shortfall of almost 5bn litres of water per day between the sustainable water supplies available and the expected demand. The eastern part of the region is one of the driest parts of the UK, so the challenge is significant.

7.4 Water quality is at risk of pollution from wastewater, pollution from towns, cities and transport, pollution from farming and changes to the natural flow and level of water. Sewage overflowing from treatment plants, and the age and capacity of combined sewerage systems built during the rapid development of towns and cities in the 19<sup>th</sup> century, add to the challenges facing our water companies.

### **Institutional Landscape**

7.5 The Environment Agency is responsible for monitoring, improving, and maintaining water quality in the UK. Its role includes monitoring water quality, identifying pollution sources and developing improvement plans. Its regulatory functions include permits for activities that affect water quality. The Environment Agency investigates pollution incidents and works with partners to address them; it also provides water quality information to the public. It works with a

variety of partners, including councils, water companies, farmers, local businesses, and communities.

7.6 The Water Services Regulation Authority (Ofwat) regulates water quality by ensuring that water companies provide safe drinking water. Ofwat inspects water companies to ensure they are following the Water Quality Regulations and verifies that water companies are conducting the correct tests on drinking water. It sets standards for water quality and uses regulatory rules to ensure water companies prioritise environmental improvements. Ofwat's other roles include ensuring water companies are well run and that the water system is sustainable.

### **Infrastructure Investment**

7.7 In December 2024, Ofwat approved water companies in England and Wales combined £104bn investment plans for the eighth asset management period (AMP8), between 2025 and 2030. This decision marks a significant shift in the scale of investment in the sector, nearly quadrupling expenditure compared to previous years.

7.8 Central to the AMP8 investment strategy is an allocation of £12bn aimed at reducing sewage spills from storm overflows by 45% from 2021 levels by the year 2030. Additional funding includes £6bn for upgrades targeted at combatting nutrient pollution across approximately 1,000 sites, £3.3bn focused on nature-based solutions to enhance biodiversity, and £2bn marked for development financing to unlock a projected £50bn investment in the sector.

7.9 This latter funding will help kickstart 30 major infrastructure projects, including the construction of new reservoirs and large-scale water transfer schemes, aimed at bolstering water supply resilience amid changing climate conditions.

### **Water Consumption**

7.10 The UK faces a growing gap between water demand due to population increase and climate change. It is predicted that by 2050, summers in the Midlands will be on average 2.6°C warmer than today with 16% less rainfall. This will place a strain on available water supply leading to potential water scarcity, particularly during dry periods. Over-abstraction of groundwater and the need for increased water efficiency measures - by both individuals and water companies – is vital to manage usage responsibly. Issues such as water leakage from aging infrastructure and a lack of public awareness regarding water usage habits are also a concern.

7.11 To increase the availability of water supply, Anglian Water is planning two new reservoirs, one of which is in the East Midlands. The Lincolnshire Reservoir near Scredington (North Kesteven) will cover 1,200 acres of countryside and is classed as a Nationally Significant Infrastructure Project. It will hold 55m cubic metres of water, which the company says is vital in keeping up with the growing population.



Proposed Lincolnshire Reservoir near Scredington (North Kesteven)

7.14 The Environment Act 2021 sets a target to reduce the use of public water supply in England, per head of population, by 20% by 2037-38 from the 2019-20 baseline. The immediate focus should be on saving water. There are huge opportunities to use water more efficiently and stop the millions of litres of water being lost per day in our homes and businesses through leaking pipes, toilets, taps and urinals.

7.13 Severn Trent is responsible for 49,000km of pipes supplying water to homes and businesses. It reduced leakage by 15% between 2012 and 2022 and is on track to save a further 15% by summer 2025. Plans include enough replacement water mains by 2030 to go from Land's End to John O'Groats twice. It

is also investing in new ‘in-pipe’ monitoring to help spot where water might be escaping.

- 7.14 Currently around 60% of household properties are metered in England. Many meters require a physical visit to record consumption. The Environment Agency is asking water companies to stop installing these types of meters and instead, roll out smart meters which capture daily and sub-daily usage data.
- 7.15 In October 2024, Anglian Water announced the extension of contracts with its delivery partners to complete its smart meter roll out by 2030. So far, Anglian Water has fitted 1m smart meters across its region. The technology is critical to influencing consumption and has helped find and fix over 300,000 leaks so far. The aim is to install over 1,500 smart meters a day to finish upgrading all water meters in the region

### **Impact of Climate Change**

- 7.16 According to the Met Office, by 2050, winters will be warmer and around 13% wetter across the Midlands, with more extreme heavy rainfall events. During winters, rainfall intensity could increase by 25%. While summers are projected to become drier, when storms do occur, they are likely to be 20% more intense; this could lead to a heightened risk of flooding by 2070, especially under high emission scenarios.
- 7.17 The Environment Agency has published peak rainfall intensity guidance to help developers allow for increased intensity in

their designs. Water companies face a great challenge in upgrading existing drainage systems to cope with storm intensities for which they were never designed. In towns and cities, increased rainfall entering aging combined sewerage systems risks both flash flooding and pollution of rivers through storm overflows.



Installation of Smart Water Meters (source Anglian Water)

- 7.18 Severn Trent is to create the ‘urban catchment of the future’ in four towns in its region<sup>51</sup>. In doing so, it aims to protect circa 840 properties from internal flooding and improve flood resilience for over 1.3m customers. It will do this using a

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<sup>51</sup> Driving Lasting Change – Severn Trent Business Plan 2025-30

combination of natural, AI, traditional and community focused solutions including:

- Building nature-based resilience with 92 nature hubs, creating new green spaces in communities
- Redirecting rainfall by replacing 30 hectares of hard standing in the form of roads and roofs with sustainable urban drainage
- Installing 150 monitors and smart controls across 4,000km of sewers
- Using its innovative Artificial Intelligence of Things (AIOT) flow management to optimise the use of latent capacity in its existing network.

### **The Greening of Mansfield**

Severn Trent is investing £76m in Mansfield<sup>52</sup> on a range of nature-based solutions to protect communities from flooding. Working alongside Mansfield District Council and Nottinghamshire County Council, this is the largest project of its kind ever to be attempted in the country.

When complete, the scheme will be able to store over 58m litres of surface water – that is about 23 Olympic-sized swimming pools. In real terms this means reduced flood risk for 90,000 people and the creation of 390 jobs locally, too.

Solutions include more than 20,000 Sustainable Drainage Systems including basins, planters and swales, permeable paving and rain gardens.



Sustainable Drainage System retrofitted in Mansfield

<sup>52</sup> <https://www.stwater.co.uk/wonderful-on-tap/green-recovery/mansfield-sustainable-flood-resilience/>

### **Water treatment and pollution**

- 7.19 The primary water treatment challenges facing water companies in the East Midlands include climate change impacting water availability and quality; and declining river water quality due to pollution from farming and transport. Further challenges include ‘forever chemicals’ contaminants like PFAS (see below) which are difficult to remove. Companies are required to balance water usage with environmental sustainability; while ensuring the delivery of clean drinking water.
- 7.20 These challenges are being addressed by investing in infrastructure upgrades to replace old pipes, improving treatment plant efficiencies and implementing leak detection.
- 7.21 River basin management plans provide a more holistic approach by collaborating with a range of stakeholders to improve water quality in rivers through pollution reduction strategies. Water conservation campaigns are also important in educating the public on responsible water usage and implementing water saving technologies.
- 7.22 AMP8 – the next Asset Management Period, will shift focus from compliance-driven initiatives to broader environmental stewardship. Key priorities will include:
- **Resilient infrastructure:** Replacing ageing assets to minimise system failures and pollution incidents.

- **Energy efficiency:** Increasing the use of renewable energy, such as anaerobic digestion and solar power, in wastewater treatment processes.

- 7.23 PFAS (per-and poly fluoroalkyl substances) pose complex challenges due to their persistence and wide-ranging environmental impacts. International collaboration and robust regulatory frameworks will be crucial in mitigating their spread and protecting ecosystems and human health from these enduring pollutants.
- 7.24 The absence of specific regulatory standards for PFAS in drinking water in England and Wales highlights a critical gap in current legislation. The EU has acted and set limits on PFAS in drinking water. Looking ahead, the UK may follow suit with potential updates to its regulatory framework under the Environment Act 2021.
- 7.25 Further legislation may include the Government’s Net Zero Strategy targeted at reducing carbon emissions and new plastics regulations requiring utilities to implement measures such as fine filtration to reduce microplastic emissions.

### Witches Oak Water Treatment Works

The new state-of-the-art Witches Oak Water Treatment Works in Derbyshire will provide an additional average flow of 65m litres per day and increase resilience of the Derwent Valley aqueduct (DVA) network, which supplies the East Midlands grid.

In what is believed to be one of the first in the UK, the Witches Oak project will use floating wetlands as a nature-based pre-treatment.

The 33 floating wetlands are designed to function as natural filters to clean the water before it reaches the new works. They are anchored in a series of three gravel beds connected to the River Trent. These are low carbon in production and use extensive planting of reeds which further absorb carbon and increase biodiversity by providing additional habitat for wildlife.

Natural pre-treatment means the plant itself will require less energy, with lower carbon emissions and fewer chemicals to treat and clean the water. The plant includes ceramic membrane technology and a UV disinfection system for effective removal of pathogens, suspended solids and organic compounds to produce high-quality water.



Computer Generated Image of Witches Oak Water Treatment Works

### Sewerage and Wastewater treatment

- 7.26 The challenges of increased rainfall and the environmental impact of storm water overflows discharging polluted water to our rivers, increase the need for investment in sewerage systems and wastewater treatment.
- 7.27 In 2024, Anglian Water outlined its plans for additional work to protect the environment by investing in clever technology and improvements to its vast sewer network; all with the aim of reducing storm spills, preventing pollution and protecting the environment. Improvements included:

- Public sewer cleaning programmes and improvements in the top 100 highest risk areas, targeting thousands of blockages caused by wrongly disposed of fats, oils, greases and other ‘unflushables’ identified by the installation of 30,000 high-tech monitors with AI to give early warning of problems before they arise
- Create more capacity in sewers in 50 hotspot locations across the region and an increase in storm water storage at water recycling centres so they can deal with more rainfall during extreme weather
- New sustainable drainage systems in key hotspot areas, to slow rainwater from entering the sewer network, helping to prevent flooding and reduce storm spills.

7.28 Despite leading the industry with the lowest level of storm spills, every single one of the 1,471 sites across Anglian Water’s network has a detailed improvement plan that will mean storm overflows becoming a thing of the past. In the last five years, 10% of the storm overflows in the region have been completely stopped. By 2030, the company aims to have reduced the negative impact it has on rivers to zero.

## 8. Conclusions & Recommendations

- 8.1 The East Midlands makes a hugely important contribution to the national economy and has the potential to grow further and faster – and be at the heart of a sustainable energy transformation. To do so, the systemic underfunding of infrastructure across the East Midlands must be addressed.
- 8.2 The value of economic infrastructure should not be underestimated. Existing assets reduce flood risk to land and property; transport assets provide access to jobs and services and take goods to market; water and sewerage assets are vital to health and protect the environment; and energy assets power our homes and industry, the latter of which have been in the East Midlands for decades and been pivotal in powering the nation.
- 8.3 Underfunding of maintenance risks the integrity of assets that communities depend on and brings forward the time when expensive renewal is necessary. Improving existing assets is often more cost effective than building new.
- 8.4 Climate change and sea level rise is a global phenomenon. In a region that is so prone to flooding it has demonstrable local consequences. Reducing harmful emissions from our homes and businesses, modes of transport and energy production bring local benefits. All infrastructure sectors have a role to play in tackling climate change.
- 8.5 Based on our analysis, EMIP makes four strategic recommendations for change:

1. **Better Integration:** NISTA should establish mechanisms to bring sectors together to holistically manage regional infrastructure as a system, to identify potential bottlenecks, reduce harmful emissions, optimise performance and plan for future needs.
2. **Regional Granularity:** Improved regional granularity is needed within the 10 Year National Infrastructure Strategy and pipeline, so that demand can be anticipated, supply chains can build capacity, and the higher education and skills sector can plan the courses needed to train young people.
3. **A Focus on Existing Assets:** The maintenance of existing assets should have greater priority in infrastructure spending programmes nationally and locally.
4. **Improved Communication and Engagement:** Better, meaningful communication with the public and local politicians is needed to demonstrate the benefit of nationally significant infrastructure projects, and to address local concerns transparently.