Divisions Affected - All

DELEGATED DECISIONS BY CABINET MEMBER FOR ENVIRONMENT AND ECONOMY

11 September 2026

DSIT 5G Innovations Regions Project (England's Connected Heartland)

Report by Director of Economy and Place

RECOMMENDATION

The Cabinet Member is RECOMMENDED to:

a) Approve acceptance of two additional Department for Science, Innovation and Technology grant payments for the 5G Innovations Regions Project, totalling £540,000, increasing the total grant funding for the programme to £4,340,000.

b) Approve an additional £900,000 investment from the Digital Infrastructure Gainshare fund, increasing total Gainshare funding for the programme to £1,800,000 and the overall programme budget to £6,140,000;

c) Delegate authority to the Director of Economy and Place in consultation with the Section 151 Officer and the Head of Legal and Governance Services to finalise the associated funding contract changes within the approved budget envelope.

Executive Summary

2. This report seeks approval to increase the budget for the England's Connected Heartland (ECH) programme by £1.44 million, funded through a combination of additional grant funding from the Department for Science, Innovation and Technology (DSIT) and Digital Infrastructure Gainshare funding. The additional investment is required to address unforeseen technical and site-related challenges encountered during delivery of the programme's two flagship 5G infrastructure projects and to ensure that both schemes achieve their intended coverage, benefits and long-term commercial viability.

3. If approved, the total ECH programme budget will increase to £6.14 million, comprising £4.34 million of DSIT grant funding and £1.80 million of Digital

Infrastructure Gainshare funding. Forecast expenditure is £4.81 million capital and £1.33 million revenue.

4. Digital Infrastructure Gainshare funding is generated from revenue-sharing arrangements associated with the Better Broadband for Oxfordshire contract. These funds are ringfenced for reinvestment in projects that support the furtherance of digital infrastructure across Oxfordshire.

5. This decision request follows approval by cabinet on 19 December 2023 to accept a Department for Science, Innovation and Technology (DSIT) grant of £3.80 million awarded to OCC for funding the England's Connected Heartland (ECH) programme. The December 2023 decision also authorised the use of the gainshare funding held in ringfenced reserves for the purpose of supporting digital infrastructure projects.

6. On 16 July 2024 cabinet further agreed to authorise the commensurate award contracts for managed 5G private network services for each of the two capital projects forming the project known as England's Connected Heartland (ECH) for a combined value of the DSIT capital grant of £3.8 million plus a £0.9 million drawdown of Gainshare funding.

7. Both capital project requirements have been subject to an Open Procedure procurement, and the two contracts were awarded (to Vodafone and AWTG) following a successful formal open competitive procurement process. The two capital projects comprise a 5G Private Mobile Network (MPN) for Harwell Science and Innovation campus, and a 5G MPN for deployment along the new stretch of East West Rail between Bicester and Bletchley.

8. Following award, detailed design surveys and delivery planning identified a number of technical complexities and site constraints which were not apparent during the initial feasibility and procurement stages. Addressing these issues has required significant redesign work and generated additional delivery costs to ensure the necessary coverage requirements for both projects.

Exempt Information

9. N/A – contract award notices are in the public domain and will be subsequently updated to reflect any changes made.

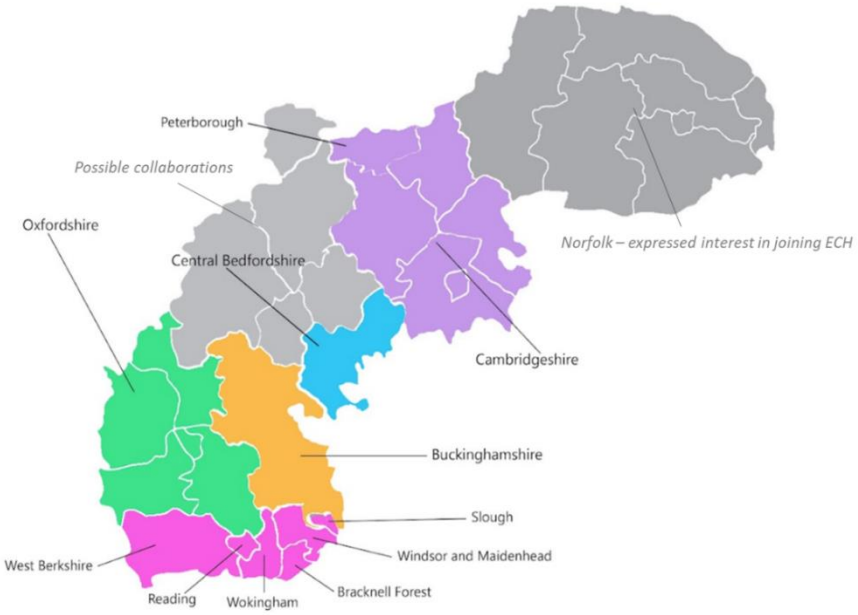
Context and Background

10. **Digital Infrastructure** comprises fixed broadband connectivity and mobile voice/data connectivity along with connected assets such as Internet of Things (IoT) devices. Wide availability and access to good connectivity in the internet age is critical for a huge array of public and private sector services to be delivered productively and frequently can be linked to both clean economic growth and carbon reduction by mitigating the need for travel.

11. **Oxfordshire Digital Infrastructure Programme (DIP)** has been in place since 2014. The initial focus was fixing the chronic lack of broadband infrastructure across Oxfordshire. The core project was known as Better Broadband for Oxfordshire Better Broadband for Oxfordshire | Digital Infrastructure Programme (digitalinfrastructureoxfordshire.co.uk) delivered access to superfast broadband for 100,000 homes and businesses over a period of six years. The delivery contract with Openreach was constructed as a profit-share where Openreach paid OCC a proportion of revenue earned predicated on take-up of services by our residents. This adoption rate has reached over 80% and allowed for DIP to accrue a fund known as gainshare which is ringfenced for further investment the council wishes to make in digital infrastructure. The programme has delivered several other projects since 2014, including Businesses in Rural Oxfordshire (BIRO) a Top-up Gigabit Voucher Scheme (GVS), & GigaHubs. DIP has more recently focussed on improving mobile infrastructure as wireless connectivity becomes more strategically important, especially with the advent of 5G. The programme is self-funded with all staff costs drawn from the Gainshare fund, as well as providing the source of capital needed to support other digital infrastructure projects either as direct funding, augmenting other central government grants (match funding), or financially underwriting capital projects which have revenue generation/cost saving potential.

12. **England's Connected Heartland** is the regional partnership comprising the Local Authorities in the map below. The partnership was formed and is led by Oxfordshire County Council and is underwritten by a Memorandum of Understanding. There are scheduled partner activities and a Partnership Board.

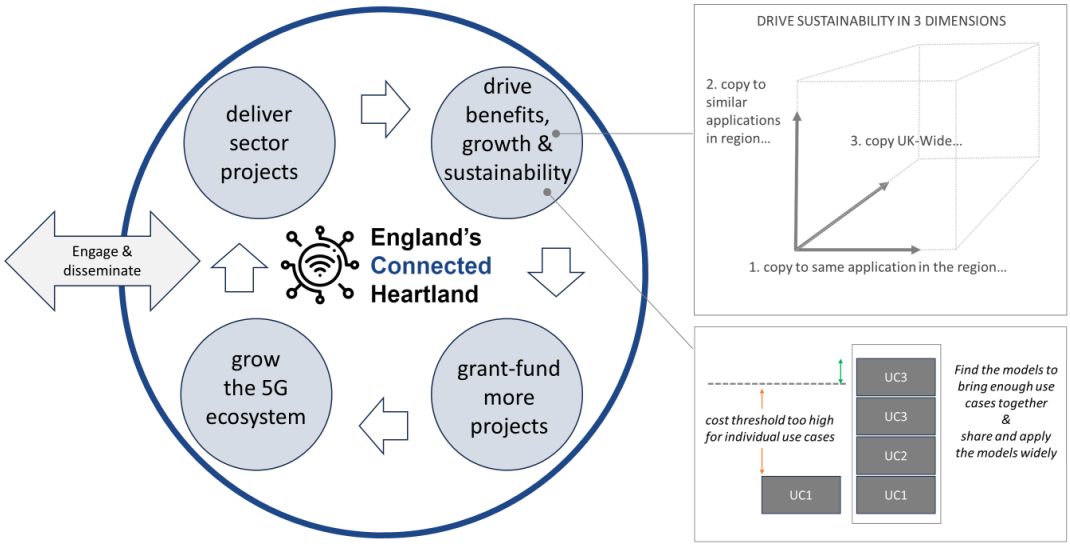
Fig 2: England's Connected Heartland



13. **UK Wireless Infrastructure Strategy** published in 2023 sets out the case for driving private and public investment in wireless infrastructure. The report concludes that 5G"…will be the cornerstone of our digital economy…" where widespread adoption could see £159bn in productivity improvements by 2035. The report further sets out that the UK is falling behind in adoption of advanced wireless connectivity, particularly 5G Mobile Private Networks (MPN's). MPN's offer significant productivity gains in enterprise settings where automation can be enhanced by having literally thousands of small 5G transmitter/receivers attached to assembly line plant, tooling, laboratory equipment, sensors, and many other applications.

The DSIT 5G Innovation Regions (5GIR) is an intervention funded programme aimed at improving adoption in specific UK sector verticals. The ECH Advanced Manufacturing (Harwell) and Transport (East West Rail) projects are set to test and demonstrate commercial models that if successful can be widely replicated. This is represented in the diagram below.

Fig 3: Commercial Model Development



14. **Supplier Consultation**. Extensive informal consultation with suppliers took place prior to structured engagement in the form of supplier webinars, each attended by over 70 people representing over 30 suppliers. This was followed with publishing Prior Information Notices (PINs), one for each procurement.

5G Standalone (SA) Private Mobile Networks differ from standard 5G networks provided by Mobile Network Operators in a number of important ways. These are closed networks with dedicated SIM cards to enable access. Because they are private, they offer service level agreements for important aspects needed in enterprise deployments, including availability, latency, & guaranteed bandwidth. 'Standalone' is a new capability in the UK. It means that not only the Radio Access Network (RAN) is dedicated, but the core backhaul fibre network is also not shared with any other services. Both networks are being procured as managed services with the suppliers responsible for service management, reporting, fault management etc.

15. **Stakeholder Engagement** has been widely undertaken over several months. This has been aimed at capturing requirements, testing demand & likely use cases, as well as establish preparedness for installation and integration with other ICT infrastructure and assets. This has included;

- Harwell:
  - Science & Technology Facilities Council (STFC), Advanced Research Clusters (ARC), Asset Management team, Estates, IT Management

group, Security management team, and individual entities such as European Space Agency (ESA), SA Catapult, Moderna and others.

- Rail Project:
  - Network Rail, Network Rail Telecoms, East West Mainline Partnership, East West Rail Company, Chiltern Railways, England's Economic Heartland (EEH), Dept for Transport (DfT), National Farmers Union (NFU) and others.

16. **Functionality, Purpose, and Objectives of the projects**

a) **Harwell Science & Innovation Campus:** With over 200 innovative enterprises across four clusters (Space, Energy, Health, & Quantum) located at Harwell, this is an ideal location to demonstrate how a private 5G network can provide a range of benefits. The barrier our approach seeks to overcome is effectively 'who pays?' It is much more cost effective to deploy a single network that can be accessed by multiple entities than it would be for individual enterprises to stand up their own individual MPNs. Equally, those organisations such as STFC and ARC who do have broader responsibilities across the estate, despite having developed plans for a 5G MPN at Harwell, have not been able to pull together funding model business cases to invest in this capability. It should be noted that Harwell campus competes with similar science parks across the globe in locations such as Silicon Valley, Beijing, Singapore etc where this kind of connectivity is readily available. Currently there is no MNO 5G coverage at Harwell at all and even the 4G mobile coverage is patchy. The plan for Harwell should also make it more likely that a public 5G network would be built by one or more MNOs as our ECH project will make infrastructure assets available for use. After the first year of operation, ECH will work with stakeholders at Harwell to establish a process for billing and collecting revenue for users of the 5G MPN, most likely via existing ground rent/service charges issued to tenants.

b) **Rail Project:** The 5G rail project seeks to resolve an entirely new commercial model to enable the rail industry to find a way of providing decent connectivity for rail commuters. This is a long-standing problem in the UK and stems from the same 'who pays' conundrum as described in the Harwell project**.** The ECH project is using the concept of stacking use cases each with potential revenue opportunities which when combined aims to reduce or remove the need for public subsidy. These revenue streams can be described as:

(1) Train Operating Company (TOC) where the 5G MPN is made available via SIM card added to the train-top mobile antenna box which augments any MNO signal available on the route

(2) Network Rail where the connectivity can demonstrate the means of collecting the vast amount of data gathered onboard such as track condition sensors, trackside video of embankment conditions, onboard security, train safety, CCTV etc.

(3) Network Rail maintenance yards such as the vast new facility being built at the intersection of HS2 with EW Rail.
(4) Agri-tech connectivity for farms. There are over thirty farms along the short section of track in scope which is typical of much of the rail network across the UK. Agri-tech is a huge enabler of reducing costs for farms and improving productivity, but good connectivity is required and is often not available given MNOs focus on built up areas for infrastructure deployment
(5) Residential Fixed Wireless Access (FWAS) broadband service to trackside communities
(6) Business Park connectivity along the route which is also not uncommon given planning consent is easier for industrial units when near rail lines

To note, OCC, Cherwell DC, and Buckinghamshire Council have previously invested in significant spare trackside fibre and associated fibre breakout points (outside the rail fence) along this section of track. The purpose of that investment was to support this type of implementation at the point of the new section of track being built as it is 1/10th of the cost of retrofitting and was seen as a strategic investment by the funding partners.

17. Following contract award for both projects, detailed design surveys and delivery planning identified a number of technical complexities and site constraints which were not apparent during the initial feasibility and procurement stages. Addressing these issues has required significant redesign work and generated additional delivery costs to ensure the necessary coverage requirements for both projects.

18. For the 5G Rail project, the original network design relied on the use of existing Network Rail GSM-R mast infrastructure. Subsequent technical assessment determined that this approach was not viable, requiring a complete redesign using new mast locations on privately owned land. This has resulted in additional requirements for land agreements, wayleaves, planning activity, power supplies, fibre connectivity, microwave backhaul and associated civil engineering works.

19. At Harwell Campus, the original design was based on deploying equipment on existing rooftop locations. Ongoing campus redevelopment and future building plans have subsequently rendered this approach unsuitable, both because of site availability constraints and because it would not deliver the required level of network coverage across the expanding campus.

The addition of new buildings across the campus significantly affects radio propagation and mobile network performance. These structures obstruct, absorb and reflect 5G signals, creating areas of reduced coverage and impacting network capacity and reliability. To maintain the required service levels, the network design has therefore been revised to utilise alternative infrastructure locations, including campus lighting columns, resulting in additional deployment costs.

20. DSIT has provided two additional grant payments totalling £540,000 to further support the project completions and the programme is seeking a further £900,000 investment from Digital Infrastructure Gainshare to fund the additional contract costs from the required design changes.

21. Approval of recommendations in this report would establish a total programme budget of £6.14 million, comprising £4.34 million DSIT grant and £1.80 million Gainshare. Forecast expenditure is £4.81 million capital and £1.33 million revenue.

22. Without the proposed budget increase, both projects would remain capable of delivering operational 5G networks. However, coverage would be materially reduced. At Harwell, this would limit availability to a smaller proportion of businesses and innovation facilities. Along East West Rail, coverage would extend across only part of the approximately 30-kilometre Bicester to Bletchley route. This would reduce the long-term strategic value of the projects and the investments made in them to date, constrain future commercial opportunities and diminish their ability to act as demonstrator schemes for future investment.

23. The ECH programme will be entirely funded via external (DSIT) grant funding £4.34 million (Received) and access to the digital infrastructure gainshare fund of £1.80 million (Held by OCC) to cover the increased contract costs and the minimum operational contract period 3 years post implementation. There are confirmed sufficient funds for the two capital programmes and all associated works (£5.18 million) and the operational delivery costs £0.96 million of uncommitted gainshare, as laid out in this report.

24. Note, the financial position set out in this report excludes future income generated by the two networks. Although both projects are expected to generate revenue through ongoing commercial use, a reliable forecast cannot be produced at this stage. Future income will be influenced by the final coverage achieved, the number and type of users served, and the value of services that the networks are able to support. As these factors will only become fully known once deployment is complete and the networks are operational, no income assumptions have been included in the financial appraisal. This reflects a pragmatic approach to assessing the programme's funding requirement. Future income generated by both projects is planned to be returned to the Gainshare Fund for supporting future projects.

Corporate Policies and Priorities

25. The England's Connected Heartland (ECH) programme supports Oxfordshire County Council's Corporate Plan priorities by using advanced digital infrastructure to enable innovation, economic growth, improved connectivity and more sustainable public services. The programme aligns with the Council's ambition to work with partners to deliver positive outcomes for residents, businesses and communities across Oxfordshire and the wider region.

26. The programme demonstrates the Council's commitment to being a Partner of Choice through Oxfordshire's leadership of a regional collaboration involving local authorities, public sector organisations, transport partners, research institutions and private sector suppliers. The programme has established shared governance arrangements, collaborative delivery mechanisms and knowledge-sharing activities that support innovation across a wider geographic area than Oxfordshire alone.

27. The projects contribute to the Council's ambition for a Greener Oxfordshire by supporting the development of digital infrastructure that can enable more efficient transport systems, remote monitoring, data-driven operations and reduced travel demand. The East West Rail private 5G network project is specifically intended to demonstrate how advanced connectivity can support rail operations, improve passenger experience and encourage greater use of public transport. The Harwell project supports the development and testing of digital technologies that have the potential to improve resource efficiency and support innovation in sectors including energy, science and advanced manufacturing.

28. The programme also supports a Fairer Oxfordshire by helping to improve access to advanced digital connectivity and by creating opportunities for economic growth, investment and employment. The Harwell network is intended to provide businesses and research organisations with access to infrastructure that would otherwise be difficult or prohibitively expensive to deploy individually. The rail project is designed to explore commercially sustainable approaches that could ultimately support improved connectivity for businesses, communities and passengers beyond the immediate project area.

29. The projects contribute to Thriving Communities by supporting the digital foundations required for modern public services, business growth and future innovation. The programme is testing approaches that, if successful, could be replicated elsewhere, helping to ensure that communities and organisations can benefit from improved digital connectivity and emerging technologies.

30. The programme also supports the Council's wider strategic objectives for innovation, economic development and place shaping. The Harwell Science and Innovation Campus project supports one of Oxfordshire's globally significant innovation locations, while the East West Rail project aligns with wider regional ambitions to improve connectivity across one of the UK's leading knowledge economy corridors. Together, the projects seek to demonstrate new commercial models for private 5G networks that could attract future investment and support long-term economic competitiveness.

31. Overall, the ECH programme supports Oxfordshire County Council's vision of working collaboratively to deliver sustainable economic growth, improved connectivity, innovation and better outcomes for residents, communities and businesses across Oxfordshire and the wider regions.

Financial Implications

32. The ECH programme will be entirely funded via external (DSIT) grant funding £4.34 million (Received) and access to the digital infrastructure gainshare fund of £1.80 million (Held by OCC) to cover the increased contract costs and the minimum operational contract period 3 years post implementation.

33. Confirmed there are sufficient funds for the two capital programmes and all associated works (£5.18 million) and the operational delivery costs £0.96 million. As such the projects bear no financial risk to OCC and the contracts were awarded using an open competitive tendering process and in line with value for money principles.

Comments checked by: **Kathy Wilcox, Head of Corporate Finance and Deputy Section 151 Officer.**

Legal Implications

34. The two 5G programmes that are referred to in this Cabinet paper were both subject to a compliant legal process under PCR2015 regulations, with both legal and Procurement members contributing to the construction and execution of the ITT and the associated Contract.

35. Adding value to the existing contracts will require compliance with governing legislation (PCR 2015 and the Subsidy Control Act 2022). Legal Services should be engaged to ensure that any contract variations comply with legislation.

Comments checked by: **Busola Akande, Solicitor (Contracts)**

Staff Implications

36. Each of the regional partners have committed to support the ECH programme for three years to the extent that is necessary. As the contract holder and lead local authority, Oxfordshire CC will need to resource the delivery, ongoing contract management, and commercialisation aspects for three years. This will likely be 2* FTE which will be resourced from the digital infrastructure programme team, which itself is entirely funded from the programme gainshare fund.

Equality & Inclusion Implications

37. No adverse impacts on any protected characteristic groups have been identified as a result of the recommendations contained within this report. The proposals relate primarily to the acceptance of additional external funding and approval of contract variations necessary to deliver the agreed project objectives.

38. The projects do not alter the Council's policies in relation to equality, diversity or inclusion and no disproportionate impacts on specific groups are anticipated.

Local Government Reorganisation Implications

39. Local Government Reorganisation (LGR) is not expected to materially affect delivery of the ECH programme or the achievement of its immediate outputs. However, Oxfordshire County Council is expected to cease operating from April 2028, with its functions transferring to three new unitary authorities. While Local Government Reorganisation will change the governance landscape within Oxfordshire from April 2028, it is not expected to diminish the value of the outcomes delivered through the ECH programme. The programme has established digital infrastructure, partnerships, technical knowledge and evidence that will remain available to successor authorities and can continue to support future priorities around integrated transport, sustainable economic growth, innovation and improved public services. The main potential risk is to the long-term governance, ownership and exploitation of programme benefits beyond the lifetime of the project. To mitigate this risk, programme outputs, evidence, partnerships, lessons learned and any enduring assets will be documented and made available to successor authorities as part of normal transition planning. The ECH programme supports strategic objectives relating to transport connectivity, innovation, economic growth and improved public services, and these outcomes are expected to remain relevant under future local government arrangements. Accordingly, Local Government Reorganisation is considered a manageable transition risk rather than a significant threat to the sustainability of programme benefits.

Sustainability Implications

40. Digital infrastructure invariably enables communication that reduces the need for travel which both improves productivity as well as reducing carbon emissions. The Harwell project will provide both aspects where greater collaboration is possible between Harwell enterprises and their supply chain and partner institutions, both within the UK and internationally. The rail project seeks to find a sustainable funding mechanism that will enable reliable rail passenger connectivity. This will in turn attract more people to using sustainable rail transport rather than vehicle commuting. Whilst the ECH rail project is very small in scale, if successful it could have an application much more widely across the UK’s rail network.

Risk Management

41. The ECH programme is managed in accordance with the Council's project governance and risk management arrangements. A detailed programme risk register is maintained and reviewed regularly by the programme team and governance boards. The recommendations in this report are intended to

mitigate delivery risks that emerged following detailed site surveys, technical design development and delivery planning activities.

42. Approval of the recommendations will reduce delivery risk by enabling both projects to be implemented substantially in line with their intended objectives and coverage requirements. Without the proposed funding, the projects would need to be delivered on a reduced basis, which would *materially reduce the coverage, functionality and benefits realisation.* This would significantly diminish their value as demonstrator programmes for future private 5G deployment.

Consultations

43. Whilst there is no statutory consultation requirement associated with the recommendations contained within this report, extensive stakeholder engagement has been undertaken throughout the development and delivery of the ECH programme and the associated procurement activities.

44. The programme has been developed collaboratively through the England's Connected Heartland regional partnership and has involved ongoing engagement with participating local authorities, government departments, infrastructure providers, supplier organisations and intended project beneficiaries.

45. Stakeholder feedback and technical input have directly informed the development of the revised network designs and delivery approaches that underpin the recommendations within this report. The proposed contract changes and associated funding requirements reflect the outcomes of this collaborative engagement process and the technical evidence gathered during project delivery.

Robin Rogers
Director of Economy and Place

Contact Officer: Craig Bower, Digital Connectivity Programme Director

September 2026