



The Ayrshire 5G Innovation Region

End of Project Report

MARCH 2026



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Executive Summary

Introduction & Ayrshire 5G Innovation Region Summary

In 2024, the UK Government's Department for Science, Innovation and Technology launched a £40 million fund for Local Authorities to establish themselves as '5G Innovation Regions', promoting the adoption of advanced wireless technologies and identifying key sectoral capabilities and opportunities in regions.

The Ayrshire 5G Innovation Region (A5GIR) was selected as one of the successful regions. The programme spans North, South and East Ayrshire and builds on the foundations of the Ayrshire Growth Deal and its established Innovation Hub model. It was designed not only to deploy advanced wireless infrastructure, but to create a structured environment in which businesses, public sector organisations and education providers could explore, test and adopt digital connectivity solutions in real-world settings.

The overarching ambition of A5GIR has been to lay the foundations for a coordinated Ayrshire Digital Economy Ecosystem — one that enables businesses to harness digital technologies for growth, ensures the workforce is equipped with future-ready skills, and strengthens the region's long-term competitiveness.

The programme has focused on two of Ayrshire's priority growth sectors: Manufacturing and Tourism, while also supporting Aerospace, Engineering and SME digital adoption more broadly. Across five core projects and one cross-cutting ecosystem workstream, A5GIR has combined infrastructure deployment, use case development, business engagement and skills investment into a single, integrated regional programme.

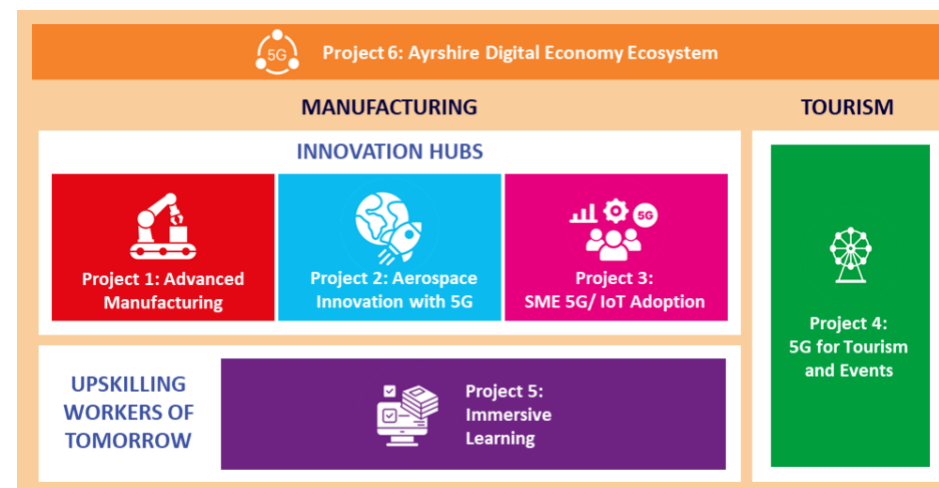


Figure E1: Ayrshire 5G Innovation Region Approach (Source A5GIR)

In **Advanced Manufacturing (Project 1)**, a 5G Mobile Private Network (MPN) was deployed at the Digital Process Manufacturing Centre (DPMC), creating a live industrial testbed environment. This has enabled businesses to explore practical use cases, including augmented reality-enabled maintenance, quality control applications and immersive digital training.

Within **Aerospace (Project 2)**, the University of the West of Scotland established the Digital Connectivity and Innovation Centre (DCIC), deploying both a 5G MPN and Open Radio Access Network infrastructure. This has positioned Ayrshire as a centre for experimentation in industrial connectivity, supporting both applied industry use cases and forward-looking research into beyond 5G and 6G technologies.

The **SME 5G/IoT Adoption Programme (Project 3)** delivered two rounds of grant funding, supporting businesses across manufacturing, logistics, food and drink, and tourism to implement advanced wireless solutions. These projects combined public

investment with private sector match funding, ensuring strong commercial alignment and embedding digital transformation within core business operations.

In **Tourism and Events (Project 4)**, connectivity enhancements were delivered across flagship regional venues, including Irvine's Great Harbour Maritime Mile, Dean Castle Country Park and Ayr Low Green. These deployments have strengthened digital resilience, improved operational communications and laid the groundwork for enhanced visitor experience and smart event management.

Alongside infrastructure and business adoption, the **Immersive Learning (Project 5)** workstream has invested in future skills development. Through public and private 5G-enabled learning environments at Prestwick Aerospace Cluster and across Ayrshire College, students and workers are gaining hands-on experience with advanced connectivity technologies, helping to future-proof the regional workforce.

Finally, the cross-cutting **Ayrshire Digital Economy Ecosystem (Project 6)** workstream has focused on coordination and long-term sustainability. Through structured stakeholder engagement, partnership working, and the establishment of a formal Memorandum of Understanding, the programme has created a shared framework to align digital ambition across public, private and academic partners.

FarrPoint has delivered the Benefits Realisation workstream throughout the lifetime of the programme, establishing a robust evaluation framework grounded in a clear Theory of Change and structured Benefits Realisation Matrix. This report sets out not only what has been delivered but also how the programme has strengthened collaboration, accelerated digital adoption and positioned Ayrshire for sustained transformation. It provides a comprehensive assessment of progress to March 2026 and captures the key insights and lessons that will shape the next phase of the region's digital journey.

Impact Summary

The A5GIR Region has delivered a lasting impact on the region. While it successfully deployed advanced wireless infrastructure and implemented live use cases across key growth sectors, its most significant achievement has been structural. It has created the conditions for sustained digital adoption at a regional scale.

The programme established the **Ayrshire Digital Economy Ecosystem**, shifting the region from fragmented digital activity to a coordinated and collaborative model. Digital is now embedded within sector development, business engagement and skills planning, providing a stronger platform for long-term competitiveness.

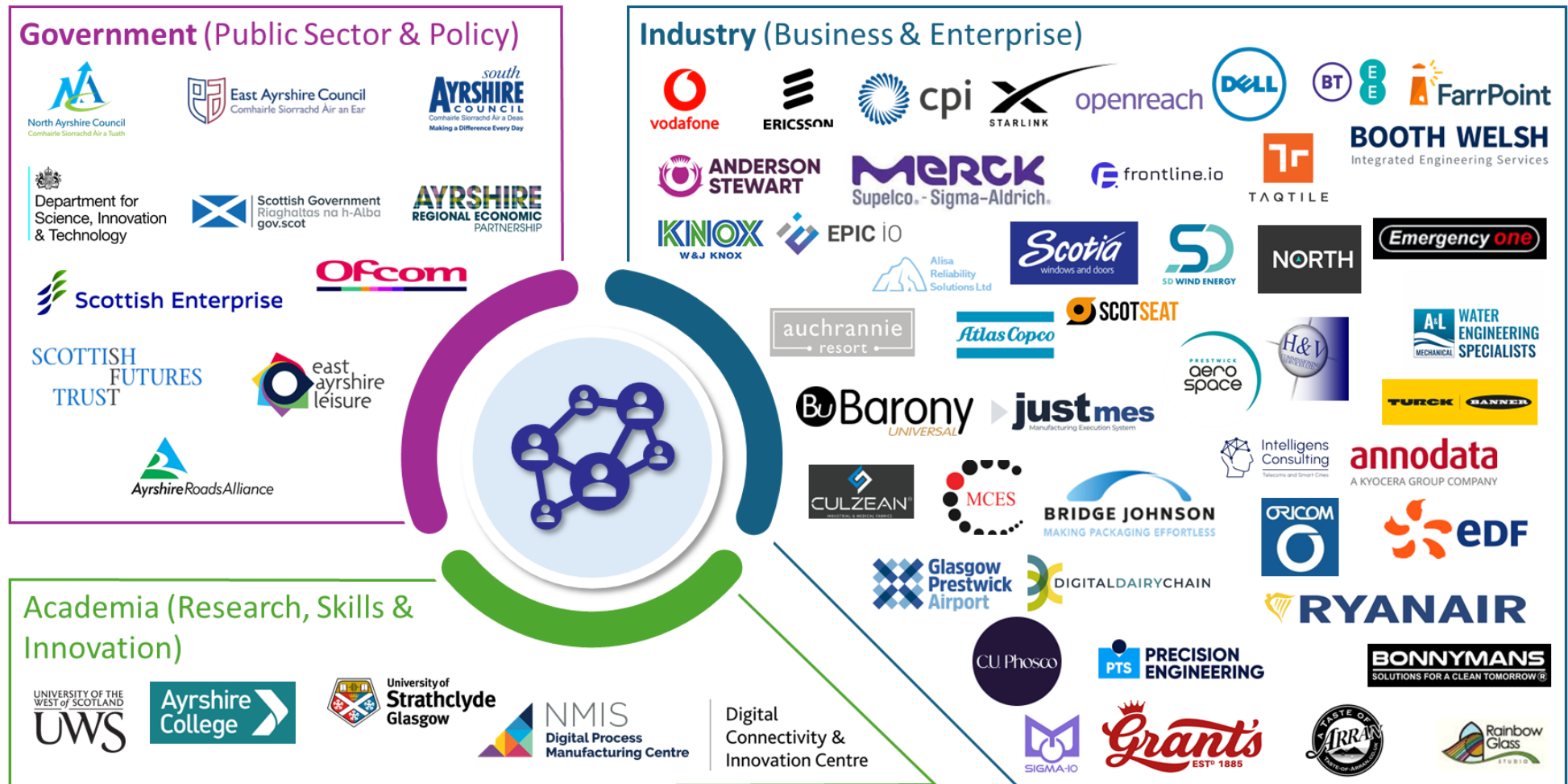
Via demonstrator environments and targeted support, the programme activated a pipeline of **Industry Digital Champions**. These organisations adopted advanced wireless solutions in live environments, evidencing productivity improvements, operational efficiencies and enhanced resilience. This peer-led validation has reduced perceived risk and strengthened confidence in digital investment.

Most importantly, the programme targeted **Maximising Growth and Impact**. Infrastructure deployment has been directly linked to business performance, private sector match funding, and workforce upskilling. SMEs have realised measurable efficiency gains, enhanced data-driven decision-making and improved operational performance. Leveraged private investment and strengthened connectivity across flagship venues have reinforced market confidence and supported regional growth.

Taken together, Ayrshire now has the infrastructure, partnerships and capabilities required to further scale digital transformation. The legacy is not simply new networks, but a coordinated ecosystem capable of sustaining long-term digital growth, competitiveness and economic renewal.

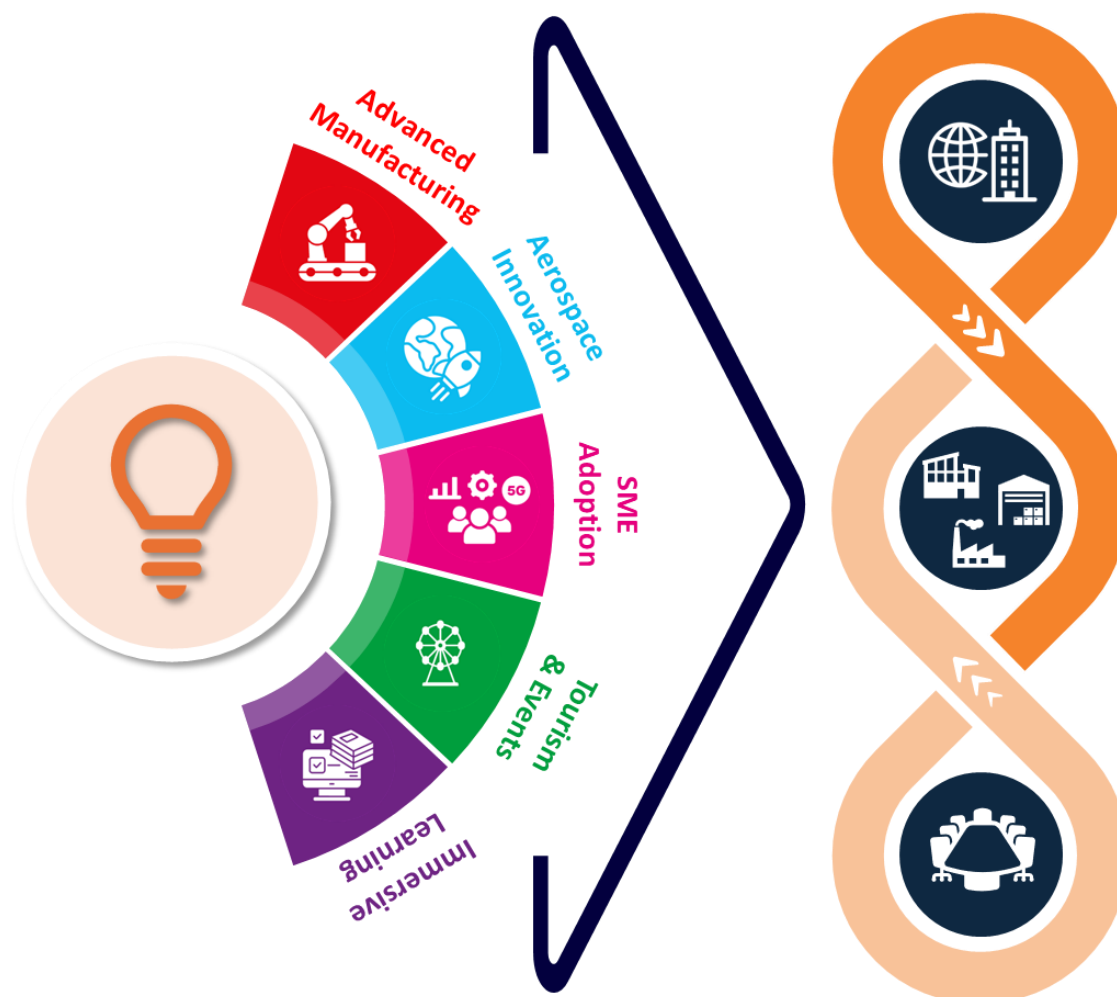
CREATE THE AYRSHIRE DIGITAL ECONOMY ECOSYSTEM

The development of this ecosystem across the triple helix of Industry, Government and Academia has led to a step-change in Ayrshire's trajectory, harnessing the potential of digital connectivity to drive a region-wide culture shift towards innovation, inclusion, and digital ambition.



ACTIVATE INDUSTRY DIGITAL CHAMPIONS

Embedding advanced wireless across Ayrshire's innovation centres and wider 5GIR projects has activated a network of Industry Digital Champions across larger anchor firms, SMEs and the public sector, driving rapid digital adoption and showcasing its tangible benefits across the region.



ANCHOR INDUSTRY CHAMPIONS

Anchor organisations leading large-scale innovation testbed trials to demonstrate advanced wireless and digital technologies and accelerate regional uptake.



Merck



Dean Castle
Country Park



Emerging pipeline
across key sectors

SME DIGITAL GROWTH CHAMPIONS

Test, adapt and showcase advanced wireless/ digital solutions in SME settings, enabling peer learning and driving adoption across the regional business base.

18 SMEs completed the Digital Innovation Accelerator Challenge

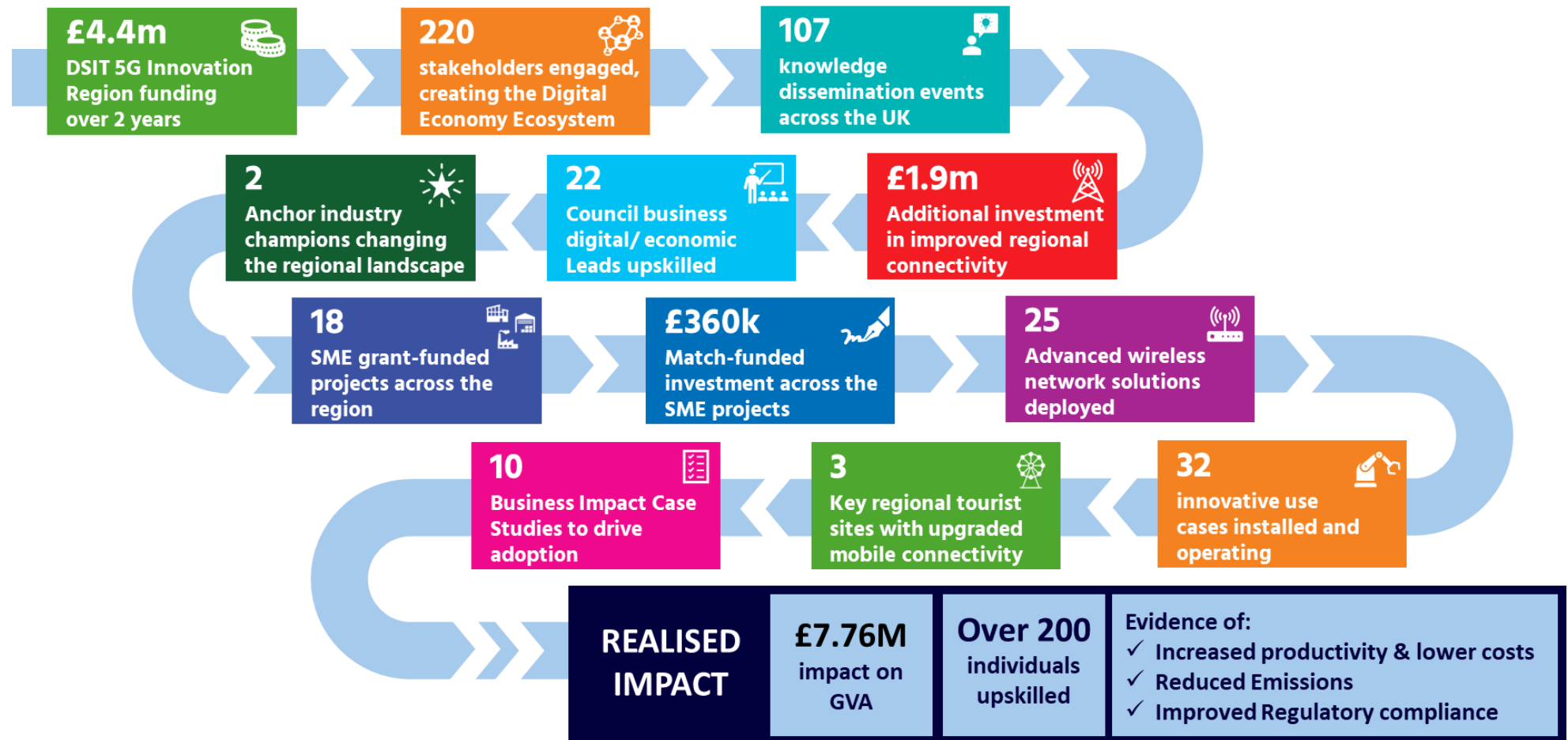
PUBLIC SECTOR INDUSTRIAL DIGITAL ENABLERS

Act as trusted intermediaries, connecting businesses to innovation support, enabling adoption and embedding digital capability in business engagement.

22 Council Economic Leads trained in advanced wireless connectivity and digital tech solutions

MAXIMISE GROWTH AND IMPACT

The Ayrshire 5GIR programme has delivered transformative regional impact, accelerating adoption, attracting inward investment, and improving connectivity. It has provided robust, real-world evidence of how advanced wireless technologies drive economic growth and create a scalable legacy for wider UK adoption.



Key Lessons Learnt

Alongside infrastructure, ecosystem and economic impacts, the project also generated valuable insights to inform future place-based digital programmes.

Business-Led Design and Demand-Led Innovation

- ! **Start with challenges, not technical solutions:** Prioritise operational problems before exploring potential technology solutions.
- ! **Demonstration quantified impact:** Evidence measurable performance gains to strengthen investment confidence.
- ! **Awareness and capability gaps remain significant barriers:** Increase understanding of industrial applications beyond consumer connectivity.
- ! **Intermediaries are critical to scaling adoption:** Strengthen advisory roles translating innovation into commercial outcomes.

Procurement, Commercial Models and Governance

- ! **Existing procurement frameworks lack sufficient agility:** Enable flexible commissioning approaches for evolving digital requirements.
- ! **Commercial models can constrain innovation delivery:** Ensure funding models support experimentation in live environments.
- ! **Funding complexity must be addressed at inception:** Clarify financial and (VAT and Subsidy Control) compliance requirements from programme outset.
- ! **Supplier alignment requires proactive management:** Maintain clear communication to align delivery expectations.

Technical Design, Infrastructure and Integration

- ! **Infrastructure dependencies must be fully scoped early:** Identify site constraints and technical prerequisites early.

- ! **Integration complexity is frequently underestimated:** Anticipate interoperability challenges across diverse technology environments.
- ! **Coverage modelling and RF planning are essential foundations:** Validate coverage assumptions through detailed upfront technical assessments.
- ! **Avoid over-engineering network solutions:** Match technical ambition to clearly defined operational needs.

Organisational Readiness and Change Management

- ! **Digital transformation requires structured change management:** Support cultural adaptation alongside technology deployment activities.
- ! **Innovation requires protected organisational capacity:** Provide dedicated time and resources for innovation participation.
- ! **Not all stakeholders are innovation-ready:** Evaluate commitment levels before progressing collaborative initiatives.
- ! **Short timelines limit measurable economic realisation:** Allow sufficient duration for productivity benefits to materialise.

Ecosystem Coordination and Long-Term Sustainability

- ! **Ecosystem coordination requires formal governance structures:** Establish clear roles and shared accountability mechanisms.
- ! **Infrastructure is a platform, not an outcome:** Translate capability into sustained commercial application and growth.
- ! **Visible demonstration strengthens inward investment confidence:** Showcase operational success to attract further external interest.
- ! **Economic transformation depends on continued scaling:** Maintain momentum beyond pilot phase to secure growth.

1. Introduction

1.1 Background

Advanced wireless technologies are key to driving the UK Government's ambitions to harness digital technologies to build a more inclusive, competitive and innovative digital economy, and transform public services. In 2024, the UK Government's Department for Science, Innovation and Technology launched a £40 million fund for Local Authorities to establish themselves as '5G Innovation Regions', promoting the adoption of advanced wireless technologies and identifying key sectoral capabilities and opportunities in regions.

The Ayrshire 5G Innovation Region (A5GIR) was one of the successful regions in this funding round. As part of its Grant Funding Agreement, each project was required to report on the measurable benefits and outcomes, and consider Lessons Learnt throughout the life cycle of the project – and how these factored into the longer-term sustainability of the related approach.

FarrPoint has been tasked with delivering the Benefits Realisation workstream throughout the lifetime of the project. This includes creating a robust Benefits Realisation Framework, establishing measurable outcomes, mapping and evaluating the impact the project has had on each benefit.

It is important to note that this assessment focuses on detailing the impact of the A5GIR project on its key objectives; it is not about quantifying the benefits of advanced wireless solutions. Those will have been captured by the individual projects within the use cases delivery and will form part of the business engagement.

This report summarises the key findings up to the end of March 2026. It builds on the interim report published in March 2025, incorporating the work delivered during the one-year extension, and presents a comprehensive overview of the project's overall impact on both the region and the wider industry. It also outlines the main findings relating to the longer-term sustainability of the Ayrshire approach.

1.2 Document Structure

The structure of this document is as follows:

- **Section 1: Introduction** – Outlines the project background, context and structure of the report.
- **Section 2: Summary of the Ayrshire 5G Innovation Region** – Provides an overview of the programme, its objectives and core delivery workstreams.
- **Section 3: Methodology** – Describes the evaluation approach, including the Theory of Change, benefits framework and key limitations.
- **Section 4: Impact Analysis** – Presents the results of the Benefits Realisation to March 2025, drawing on quantitative metrics and qualitative evidence.
- **Section 5: Key Lessons Learned** – Summarises the principal delivery insights and thematic learnings from across the programme.
- **Section 6: Conclusions and Recommendations** – Sets out the overall findings and outlines recommended next steps.

2. Summary of Ayrshire 5G Innovation Region

2.1 Overview

The Ayrshire 5G Innovation Region covers the three Local Authority areas of councils: North, South and East. The A5GIR project builds on the successful Ayrshire Growth Deal (AGD) Innovation Hubs approach. It offers the opportunity to test 5G and other advanced wireless technologies and help key stakeholders within the region understand how, where, and more importantly, if they should be deployed in their business or organisation. Across five main projects and one cross-cutting workstream (shown below in Figure 1), the A5GIR is set to create a digital innovation ecosystem that will benefit local businesses, help upskill the current and future workforce and ensure regional competitiveness.

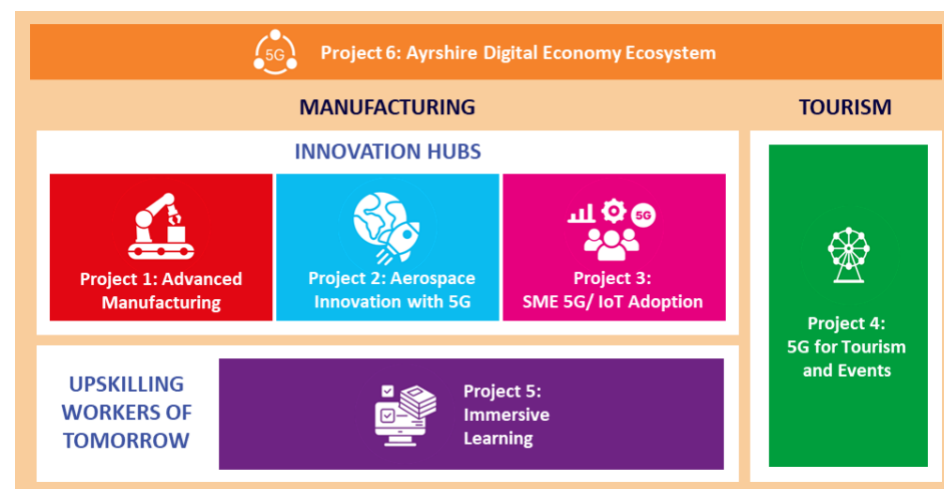


Figure 1: Ayrshire 5G Innovation Region Approach (Source A5GIR)

The regional approach focuses on two of the region's key growth sectors, Manufacturing and Tourism. The Ayrshire Digital Economy Ecosystem aims to create a region where businesses can leverage digital growth opportunities, and workers are equipped with skills to use these technologies.

On Manufacturing, the A5GIR takes a dual approach, focusing on nurturing business innovation and driving adoption through the Innovation Hubs, and upskilling workers and students in advanced wireless and digital connectivity technologies via further and higher education. Building upon the successes of the AGD, the work of the Innovation Hubs is focused on engaging with businesses, providing them with the opportunity to explore the opportunities of advanced wireless connectivity. The project teams at each hub are collaborating with businesses to pinpoint key challenges and showcase innovative wireless solutions to them.

2.2 Project 1: Advanced Manufacturing



Led by the National Manufacturing Institute Scotland (NMIS), this project demonstrated the transformative potential of advanced wireless connectivity in manufacturing. Working with Vodafone and Ericsson, the team deployed a 5G Mobile Private Network (MPN) at the Digital Process Manufacturing Centre (DPMC), creating a live testbed for industrial innovation.

As part of the Ayrshire Digital Economy Ecosystem, the DPMC focused on tackling real industry challenges. Businesses were engaged through a programme of interactive group workshops and tailored one-to-one sessions, helping them explore practical applications of advanced wireless technologies within their own operations.

The Hub showcased a range of innovative use cases and provided a clear route to adoption, connecting firms with technology providers and supply chain partners to support collaboration, investment, and implementation. There are currently three Advanced Manufacturing use cases deployed at the Hub:

- **Metaverse Solution for Improved Maintenance and Safety** - To demonstrate how to improve maintenance operations and lone worker safety. Frontline.io and the Unity platform were used to build the model, which uses the fan skin machine created by Ailsa Reliability for the DPMC facility to demonstrate the art of the possible with augmented reality and 5G connectivity.
- **Quality Control AR Demonstrator** - To demonstrate how to improve quality control, using QR codes, augmented reality, and digital product passports to streamline the inspection of food products. The use case uses 5G connectivity to transfer data to a Microsoft HoloLens 2, which uses Power Apps and Guides 365 for hands-free, real-time product verification.
- **5G Gamification and E-Learning Platform** - To showcase immersive learning through virtual training and educational materials, with an emphasis on 5G benefits within the advanced manufacturing sector.



In parallel, in partnership with Merck, a leading global pharmaceutical manufacturer, the DPMC is using the 5G MPN to replicate a real-world production environment and generate robust performance data. The project aims to validate 5G in data-intensive manufacturing settings, culminating in a technical report and Merck-endorsed case study. It also strengthens DPMC's strategic relationship with Merck and supports longer-term ambitions around Digital Twin development.

2.3 Project 2: Aerospace Innovation with 5G



The central focus of the second project has been UWS's establishment of the Digital Connectivity and Innovation Centre (DCIC) at its South Ayrshire campus. The centre is designed to drive collaboration between Further Education and Higher Education partners and the aerospace manufacturing sector, with a particular focus on the Prestwick Aerospace Cluster.

This project aimed to position Ayrshire as a leader in digital connectivity innovation, with a specific focus on supporting the aerospace sector and advancing Beyond 5G research. DCIC encouraged 5G technology adoption within the industry by working with Vodafone to use a 5G MPN and Open Radio Access Network (O-RAN).

The initial phase of the project developed three anchor use cases:

- **Enhanced Training and Skill Development Using XR Technologies** - Leveraging the MPN and Taqtile's Manifest platform, this use case demonstrates how training for technicians and engineers can be revolutionised using Extended Reality (XR) technologies, including Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR), to create immersive and interactive learning environments.

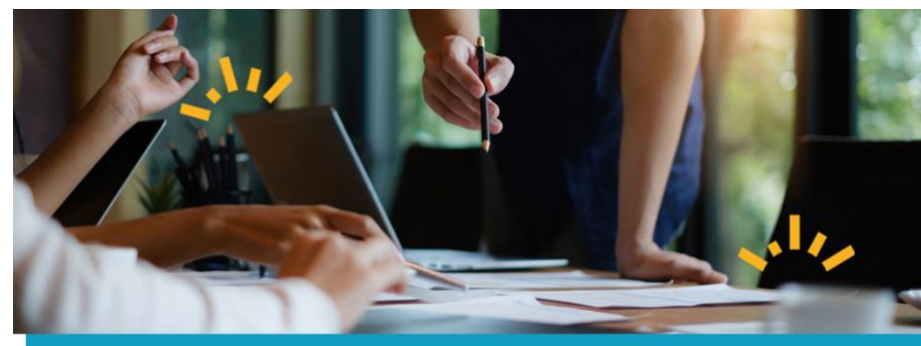
- **Remote Support, Monitoring, Troubleshooting, Inspection, and Certification Using XR Technologies** - This use case enhances operational efficiency in the aviation sector by enabling real-time remote support using XR technologies. Experts can guide technicians through complex procedures regardless of location, thereby reducing downtime and improving maintenance accuracy. DCIC is utilising Taqtile's Manifest platform to develop this solution. The system incorporates AR and VR overlays on equipment, providing real-time diagnostic data, step-by-step instructions, and remote certification capabilities.
- **Health and Safety in Advanced Aerospace Manufacturing** - This use case integrates AI-enabled Internet of Things (IoT) solutions to monitor environmental parameters such as air quality, temperature, and vibration, creating a safer, more efficient aerospace manufacturing environment.

The O-RAN infrastructure is designed as a forward-looking research and innovation platform that supports academic collaboration and industry engagement rather than an immediate commercial rollout.

As part of developing a **6G O-RAN Test Environment** use case, the existing testbed has been upgraded to the latest software release. This enhanced environment enables researchers and partners to examine how future networks can be more open, intelligent and adaptable. It also enables an external technology provider to introduce a shared dashboard that links the O-RAN platform to cloud computing environments, creating a collaborative space for experimenting with open interfaces and integration models. In parallel, significant progress has been made in embedding AI directly into the network architecture. DCIC's high-performance computing clusters are being equipped with AI-native technologies, allowing intelligence to sit at the core of the network. The next phase will focus on staff development and the

creation of a live showcase demonstrating artificial intelligence operating natively within a 6G-ready research environment.

An additional use case focused on the **Dynamic Resource Allocation and Network Slicing for Critical Services**, through which the DCIC designed and implemented a complete network slicing solution within its research cluster. Network slicing enables a single physical network to operate as multiple secure, purpose-built virtual networks, each tailored to specific requirements. The focus here has been on critical aerospace communications, where reliability, security and rapid responsiveness are essential. The solution integrates AI-based human recognition for intrusion detection at the network edge with intelligent slicing to prioritise and protect sensitive communications. This has gained international recognition, showcasing how advanced wireless connectivity can support mission-critical industrial environments.



Together, these activities mark an important step towards fully intelligent wireless systems, where optimisation and decision-making are embedded directly within both the Core Network and the Radio Access Network, rather than layered on externally. This approach lays the foundation for more responsive, resilient and adaptive connectivity in future aerospace and industrial applications.

This workstream has generated a strong academic impact, with multiple research papers being presented at international conferences. These papers explored the practical challenges of designing and deploying 5G MPNs for industrial use and examined the economic case for 5G adoption within aerospace, reinforcing both the technical and strategic importance of advanced wireless connectivity.

Aligned with the wider Ayrshire Digital Economy Ecosystem, the DCIC continues to collaborate closely with aerospace businesses to understand sector-specific challenges and explore how advanced wireless technologies can drive innovation, strengthen resilience and enhance long-term competitiveness.

2.4 Project 3: SME 5G/IoT Adoption



Led by East Ayrshire Council and North Ayrshire Council, in partnership with the Scotland 5G Centre, this initiative was designed to accelerate SME adoption of advanced wireless technologies across the region.

Year One: SME Innovation Fund

In the first year, a dedicated round of grant funding was launched to support SMEs in the Food & Drink Production, Manufacturing and Logistics sectors. The objective was to enhance operational efficiency, productivity and innovation through the practical deployment of advanced connectivity solutions.

Twelve SME projects were supported, each implementing tailored hybrid network solutions that combine wired and wireless technologies—including public and private 5G, Wi-Fi, Low Earth Orbit satellite connectivity and LoRaWAN IoT systems. These deployments enabled use cases such as remote monitoring, predictive maintenance, digital process control and real-time data analytics across multiple sites in East and North Ayrshire.

- **4G Energy Monitoring (Merck)** - This project is focused on delivering valuable data on both energy consumption and the reliability of the three most important and energy-intensive pieces of equipment. These technologies will improve site operation efficiency and energy consumption.
- **Automated Slurry Monitoring (Anderson Stewart Castings)** – This project focuses on deploying an automated slurry monitoring and dosing system that integrates real-time data from viscosity, temperature, pH, and density sensors. This will improve process control, efficiency, and consistency in the production of casting moulds.
- **Aquaculture RFID Nets (W&J Knox Ltd)** - This project aims to demonstrate that implementing RFID (radio frequency identification) technology can improve operational efficiency by enabling real-time status updates of customer work orders. By transitioning from manual tracking methods to an automated RFID system, businesses can overcome challenges such as deteriorating tags and manual data entry, resulting in faster, more accurate inventory counts and better compliance with regulatory requirements.
- **Manufacturing Execution System (MES) (Culzean Textile Solutions)** – This project involves installing JUSTMES, a specialised wireless manufacturing execution system for the textile industry, establishing an enhanced connected IT infrastructure, including cloud backup. Automating label printing, QR code asset tracking, and the installation of remote monitors to display real-time KPIs for staff will improve operational efficiency.
- **ECBOS Water System Temp Readings (Auchrannie Resort)** - This project involved upgrading the existing ECBOS building control system to integrate LoRaWAN for enhanced monitoring. It also included the installation of sensors and internal gateways, leveraging existing IT infrastructure for connectivity.

Sensors will monitor water temperature in hotel rooms/ tanks to aid detection/ prevention of Legionella build-up in the resort's water system.

- **Production Line Wireless Data PoC (Barony Universal Products)** – This project focuses on integrating smart devices onto new machines with existing interfaces or retrofitting older machines. It focuses on demonstrating the feasibility of these devices and sensors for gathering, displaying and exporting operational data in a way that offers value to the business.
- **Smart Digital Manufacturing (Emergency One Group)** - This project upgrades the Wi-Fi solution to improve efficiency across business operations. This upgrade is necessary for improved reliability and futureproofing, addressing point-to-point transfer issues for big data, CCTV security, and telematics systems, all of which are limited by current Wi-Fi arrangements.
- **Wireless Bridge (Scotia Windows and Doors)** - This project aims to enhance traceability, streamline operations, and improve data management. There is a need for digital transformation from manual analogue systems to a digital infrastructure to support real-time data flow, reduce human error and increase operational efficiency. By leveraging wireless technologies, it will facilitate a transition to a paperless environment, enhance real-time information flow, improve machine monitoring and safety, and increase output.
- **Wind Turbine Data Monitoring (SD Wind)** – This project focuses on Wind Turbine data collection, enabling predictive maintenance with the use of IoT sensors. Improved data will help verify performance (windspeed, heat, vibration, energy) to produce real-time readings that diagnose small issues before they cause serious damage.
- **Fire Damper Video (H&V Commissioning Services)** - This focuses on data collection, storage and reporting process for fire damper inspections by creating

a streamlined video reporting format. This system will allow site operatives to record videos of fire damper checks remotely and seamlessly upload them to a client-facing report on the go, ensuring that clients have access to all relevant information, including visual evidence of the works performed.

- **CRM Order Processing System (Scot Seat)** - This project will introduce a new mobile and wireless-enabled CRM order processing system that integrates seamlessly with Xero accounting software, upgrading connectivity to provide real-time data access and communication across processing and production, enabling staff to manage customer details, job tracking, quotations, invoicing and reporting in one streamlined platform, improving coordination between departments, enhancing customer experience and increasing overall efficiency.
- **Wireless ERP System (A&L Mechanical)** - This project aims to implement a comprehensive smart manufacturing ERP system that ensures traceability and governance over parts manufacturing, operational efficiency, quality control and transparency for clients.

Importantly, these projects were partly match-funded by the participating businesses, demonstrating strong commercial buy-in and confidence in the transformative potential of advanced wireless connectivity.

All projects combined public-sector investment with advanced wireless technologies to deliver practical, evidence-based demonstrations of advanced wireless in action, to deliver three core cross-cutting outcomes:

- Improved operational efficiency and productivity
- Reduced maintenance and operational costs
- Enhanced safety and regulatory compliance

Year Two: Digital Innovation Accelerator (DIA) Fund

Building on the success of the initial round, a second wave of grants was delivered through the DIA Fund. This expanded the scope and ambition of the programme, supporting businesses in embedding next-generation connectivity within broader digital transformation strategies and strengthening long-term resilience. As with Year One, projects were partly match-funded by businesses, reinforcing commitment and ensuring solutions were aligned to genuine operational priorities.

- **Secure Office Connectivity & Resilient Communications (Gromotion)** - This project focuses on deploying Wi-Fi 7 infrastructure to enhance office communications, improve cybersecurity, and future-proof digital operations. The inclusion of a 5G cellular SIM-enabled router provides resilient backup connectivity, ensuring uninterrupted communications during overseas meetings or in the event of primary network disruption. This will improve reliability, business continuity, and secure collaboration.
- **AI-Driven Commission Capture & Digital CRM Transformation (Rainbow Glass Studios)** - This project focuses on developing an AI-integrated image capture repository to convert photographs of bespoke glass commissions into labelled schematics and dimensionally accurate line drawings. Supported by 5G-enabled tablet connectivity, the system will enable real-time data capture outside the office. Alongside this, an in-house CRM platform will be developed to transition the business toward a scalable software/licensing model, improving workflow efficiency, quotation accuracy, and commercial scalability.
- **Rural Connectivity & Cloud Infrastructure Upgrade (Dustacco)** - This project establishes a SATCOM-enabled rural communications hub, integrating Wi-Fi 7 and 5G connectivity to provide consistent site-wide access where infrastructure previously did not exist. The solution includes cloud server

deployment and an enhanced server stack to deliver redundancy, resilience, and improved data security. This will enable reliable digital operations and secure remote workforce connectivity in a rural environment.

- **Site-Wide Wireless Enablement & Data-Led Decision Platform (Land Energy)** - This project deploys Wi-Fi 7 across the entire operational site to extend connectivity into previously unserved areas. Working alongside Baumgartner, the business will develop advanced dashboards leveraging up to 11 years of validated operational data. This will support data-led decision making, improve process optimisation, and drive long-term operational efficiency improvements.
- **Real-Time ERP & Wireless Warehouse Tracking (TR Bonnyman Son & Co)** - This project implements site-wide Wi-Fi 7 connectivity to enable ERP scanners beyond office-only environments, transforming stock management into a near real-time tracking system. By integrating operational data directly into the ERP platform, the business will improve inventory accuracy, reduce manual processes, and enhance visibility across the supply chain.
- **Fibre Infrastructure & Warehouse Digital Transformation (G2BS)** - This project involves installing fibre connectivity to enable high-speed, reliable data access where none previously existed. The infrastructure will underpin digital transformation across warehouse operations, providing a foundation for stock and asset tracking systems, improved logistics coordination, and more efficient operational workflows.

Together, the two funding rounds have created a strong pipeline of real-world adoption cases, demonstrating that advanced wireless connectivity can catalyse business transformation. By supporting SMEs at different stages of digital maturity, the programme has strengthened regional competitiveness and laid the foundations for sustained economic growth.

2.5 Project 4: Tourism & Events



Project 4 is focused on improving digital connectivity across the region to support events. By enhancing connectivity coverage for both operational and public use, this project aimed to ensure resilience and safety, enable business payments, and empower event organisers to enrich the attendee experience, ultimately benefiting the local economy.

The North Ayrshire 5GIR Tourism project was built on the Smart Infrastructure Pilot Programme (SIPP), which explored the deployment and impact of PAS 191-compliant smart infrastructure poles. The deployment of multi-functional smart poles within this strategic location aimed to strengthen local digital infrastructure to establish Irvine's **Great Harbour Maritime Mile** as a digitally advanced tourism and economic hub. The initial use cases of this improved wireless coverage are:

- **Enhanced Security CCTV** – deploying smart surveillance cameras to improve public safety and address anti-social behaviour at Irvine Beach.
- **Heritage-Style Smart Lighting** – installing aesthetically compatible smart lighting solutions in conservation-sensitive waterfront areas.

The programme has already delivered the core connectivity foundations across the site, including upgraded **public Wi-Fi** and operational **IoT-enabled environmental monitoring**. With these elements now embedded and in active use, the next phase of innovation can build on this platform. Opportunities for future development include immersive and augmented reality content, enhanced digital visitor experiences, and other data-led applications that align with regional priorities and the wider ambitions of the Ayrshire Regional Economic Strategy (ARES).

Although East Ayrshire Council have an existing Public Wi-Fi service within **Dean Castle Country Park**, the service was not stable or performing to an acceptable level. This project replaces the current service with a fully managed Wi-Fi solution that provides seamless connectivity when moving between buildings on the estate and outdoors for large-scale events.

South Ayrshire Council hosts a programme of events on **Ayr's Low Green**, most notably the Ayrshow, which attracts over 250,000 visitors each year. To support events of this scale, a fully managed Wi-Fi network was deployed, utilising a combination of new host infrastructure and existing lighting columns to provide resilient, high-capacity connectivity across the site.

The **public Wi-Fi service** went live during the 2025 Ayrshow, improving digital access and enhancing the overall visitor experience. However, due to programme timing and the need to ensure consistent network performance, the planned operational use cases were not activated during this initial phase.

As the network is further optimised, this network will provide key opportunities aligned with the ARES, it will enable **enhanced event operations** - including reliable connectivity for event management systems, production teams and vendor payment solutions - alongside **IoT-enabled footfall monitoring**. This will allow real-time insights into visitor flows, supporting improved crowd management, safety planning and more informed decision-making for future events.

In addition to the fixed connectivity improvements delivered across key tourism sites, the programme has also supported the creation of a **shared Ayrshire digital asset** consisting of nine mobile Starlink connectivity units. These portable units provide resilient, high-bandwidth connectivity that can be deployed flexibly to support events, temporary installations, rural attractions, tourism operators and public safety

requirements. This capability strengthens the region's ability to deliver digitally enabled events and supports the ambitions of the Ayrshire Regional Economic Strategy and the wider Digital Economy workstream.

To support delivery of this, the project team engaged with Scottish Futures Trust to develop a match-funded approach that enabled the shared Ayrshire asset to double in capacity, ensuring each council can deploy a more flexible connectivity solution across multiple events. This collaboration also provides an opportunity to strengthen partnerships with Scottish technology organisations while raising Ayrshire's profile across the tourism and events sector. Lessons learned from these deployments will be shared at future industry events, including Digital Scotland 2026, helping to showcase the region's experience in delivering digitally enabled tourism infrastructure.

2.6 Project 5: Immersive Learning



Led by Ayrshire College, this project focused on strengthening digital skills development in Ayrshire's aerospace and engineering sectors by applying immersive learning technologies. The project was initially conceived as an advanced demonstrator to develop a bespoke aerospace training environment within the College's hangar facility at the Prestwick Aerospace Cluster. The original concept proposed integrating immersive technologies with IoT-enabled assets connected via a 5G MPN, creating an interactive training environment that could demonstrate how advanced wireless connectivity could support complex engineering education and real-time data interaction.

However, following technical scoping, stakeholder engagement and solution exploration, it became clear that the digital readiness of intended users was not at a

level required to support the original approach. Given programme timelines, there was insufficient time to develop a fully bespoke solution. Stakeholders instead expressed a preference for a more accessible immersive training platform that could be deployed quickly and integrated into existing learning environments. Reflecting these considerations, and taking into account programme timelines and available resources, the project team explored alternative approaches that would still deliver meaningful outcomes aligned with the programme's wider objective of advancing digital capability and demonstrating the practical value of emerging technologies.

To support this transition, immersive training platforms developed and operated by the University of the West of Scotland were presented to Ayrshire College and key industry stakeholders, including SAI Aerospace Training and Ryanair. These demonstrations showcased established immersive learning environments capable of simulating aerospace engineering scenarios while remaining intuitive and straightforward to implement within existing education and training settings.

Following collaborative demonstrations with partners, the project shifted from bespoke technology development to adopting an existing immersive training ecosystem. The revised approach provided access to proven software, supported onboarding and training for staff and students, and integrated immersive learning tools into Ayrshire College's existing teaching and training workflows.

Stakeholders agreed to proceed with the Manifest XR Experience platform, initially focusing on an immersive landing gear maintenance scenario. This provides a realistic and interactive training environment that reflects modern aerospace engineering practices, allowing learners to engage with detailed procedures and equipment in a controlled digital setting. The immersive format supports experiential learning while remaining accessible to students at different stages of training. From a delivery perspective, the revised model reduced technical complexity and enabled

substantial progress within the available timeframe. Implementation activities include procurement of the required software licences, minor configuration and development adjustments, onboarding and training for college staff and students, and deployment and testing of the immersive experience within the College.

Beyond immediate delivery, the project also provides a foundation for future digital learning innovation. By introducing immersive training technologies and building institutional capability, Ayrshire College will be well-positioned to develop additional immersive learning assets over time. While the initial deployment focuses on aerospace engineering applications, the platform has the flexibility to support a broader range of training and education scenarios across other sectors.

Overall, the project has generated valuable learning around the use of advanced wireless within the education sector, with experimentation focusing on practical adoption, usability, digital skills development, and real-world training outcomes.

2.7 Project 6: Ayrshire Digital Economy Ecosystem



Facilitated by UWS, this cross-cutting workstream is centred on building strong, lasting networks and a sustainable digital ecosystem across the public, private and third sectors to accelerate digital adoption and maximise its economic and social benefits.

From the programme's outset, it was clear that digital transformation across Ayrshire was progressing in a fragmented and uncoordinated manner. Individual organisations were pursuing their own initiatives, but without shared strategic alignment or mechanisms for collaboration. This siloed landscape led to duplication in some areas, underdeveloped opportunities in others, and uneven adoption of emerging technologies. Digital skills provision was similarly inconsistent, leaving parts of the

workforce and organisations underprepared for technological change and limiting overall productivity and competitiveness.

Rather than focusing solely on infrastructure deployment or technical trials, this workstream has prioritised creating the conditions for long-term adoption. It has brought partners together to align ambition, share knowledge, reduce duplication and identify collective opportunities for investment and innovation. The principal outcome has been the establishment of the Ayrshire Digital Economy Ecosystem (ADEE), formalised through a Memorandum of Understanding that secures a shared, long-term commitment to collaboration. ADEE acts as a unifying framework, connecting projects, organisations and strategic priorities, and translating innovation into tangible outcomes for the region. A key delivery component has been the Digital Ambassador Programme, a series of facilitated workshops designed to build awareness, strengthen networks and increase confidence in the practical application and benefits of advanced digital technologies across the region.

The Ayrshire Digital Economy Ecosystem is fully aligned with the ambitions set out in the ARES, strengthening the region's focus on innovation, skills and inclusive growth. Delivery through the 5G Innovation Region has reinforced the ARES Digital Economy Workstream by demonstrating how coordinated connectivity and technology adoption can unlock real, demonstrable economic and social value. The programme itself was structured around the foundations created through Ayrshire Growth Deal investment, particularly the Innovation Hubs, and now provides clear evidence and learning to inform future AGD investments in building digital capital. Together, this work provides the long-term strategic spine for sustaining collaboration, scaling digital adoption and guiding future regional digital investment.

3. Methodology

3.1 Approach

This evaluation has been prepared in line with HM Treasury's [Magenta Book](#) guidance and [best practice](#) for benefits management in major projects. As the programme includes projects in Scotland, it also reflects the [Scottish Government's Digital Appraisal Manual for Scotland](#). The approach recognises that evaluation should inform decision-making throughout the policy cycle to maximise impact and learning.

The impact evaluation focuses on identifying and assessing the benefits delivered by the project. A benefit is defined as a measurable improvement resulting from an outcome that is perceived as advantageous by one or more stakeholders and contributes to organisational objectives. Benefits must therefore be measurable, represent the improvement arising from change (rather than the change itself), and create a clear link between tangible outputs and strategic goals. Different stakeholders may value benefits differently, and in some cases, a benefit to one group may represent a disbenefit to another.

To support this process, a robust Benefits Realisation Framework has been developed. This framework establishes a clear line of sight from project inputs and activities through to outputs, outcomes and strategic policy objectives, drawing on a Theory of Change approach. A Benefits Realisation Matrix captures and maps outcomes to the ambitions of the pilot and wider UK Government policy.

The assessment also considers lessons learned from delivery, including the use of resources, governance and stakeholder engagement, adherence to plans, and the key barriers and enablers influencing performance and impact.

3.2 Policy Narrative

Project objectives were defined in line with the priorities of key stakeholders. To position these within the broader policy narrative, we considered the wider strategic context, with the accountability framework shown in Figure 2.



Figure 2: Ayrshire 5G Innovation Region Accountability Framework (Source FarrPoint)

3.2.1. UK Government

Digital infrastructure policy is primarily reserved to the UK Government, reflecting its central role in driving productivity, economic growth and national competitiveness. The 5GIR Programme forms part of the UK Wireless Infrastructure Strategy, aiming to embed advanced wireless connectivity across the economy. This was driven by key policy themes including boosting productivity and job creation, supporting regional growth, stimulating research and innovation, improving public services, reducing digital exclusion, and contributing to the transition to Net Zero. More broadly, digital and technology policy is positioned at the heart of the UK's growth agenda. Priorities include raising living standards, removing barriers to growth, strengthening workforce skills, and accelerating digital transformation across both the public and private sectors. The overarching focus is on maximising the economic potential of digital technologies while ensuring their benefits are widely realised.

3.2.2. Scottish Government

Strategic documents, including the National Strategy for Economic Transformation, A Changing Nation, and the recent Digital Strategy for Scotland, position digital as a key enabler of a fairer, wealthier, and greener Scotland. Priorities include increasing productivity and innovation, supporting high-quality public services, promoting digital inclusion, and enabling a just transition to Net Zero. Collaboration between public and private stakeholders is emphasised as critical to delivery.

3.2.3. Ayrshire Region Strategic Context

The Ayrshire Regional Economic Strategy sets out a long-term vision to revitalise the regional economy and enhance the quality of life for residents. It focuses on key growth sectors including aerospace and space, energy, marine, manufacturing, and tourism, seeking to attract inward investment, strengthen existing businesses, and generate substantial employment opportunities. Following extensive regional engagement, six priority themes were identified: support for enterprise; fair work; innovation; health and wellbeing; stronger places and communities; and enhancing natural capital in line with Scotland's net zero and biodiversity commitments.

Infrastructure development and skills enhancement are central to delivering these ambitions, alongside action to build resilient communities and improve public services. A key delivery mechanism is the Ayrshire Growth Deal, a partnership between the Scottish and UK Governments and the three Ayrshire councils. The Deal aims to transform the regional economy by investing in infrastructure, connectivity, skills, and sectoral development aligned with Ayrshire's competitive strengths.

Digital investment is a core component of this agenda. The Deal allocated £14 million to a Digital Programme designed to strengthen digital infrastructure, capability, and

ambition across the region, underpinned by community wealth building. Building on this, the Ayrshire Digital Economy Framework set out five missions: enhancing digital infrastructure; improving fixed and mobile connectivity; promoting digital innovation; developing digital skills; and advancing digital inclusion. Cross-cutting priorities include empowering digital champions, using data to inform decision-making, and embedding sustainability to support a thriving, inclusive economy.

3.2.4. Local Authority Priorities across Ayrshire

Across East, North and South Ayrshire, local strategies consistently prioritise sustainable economic growth, wellbeing, fairness and environmental responsibility. Supporting businesses, investing in education and skills, tackling poverty and inequality, and strengthening communities are common themes. All three councils emphasise partnership working, organisational sustainability and improved service delivery. Digital transformation is recognised as a key enabler, with a shared focus on accessible online services, digital inclusion, workforce skills, robust infrastructure and data-driven decision-making. Investment in connectivity and smart technologies is seen as essential to improving public services, supporting innovation and fostering inclusive, resilient communities across Ayrshire.

3.2.5. 5G Innovation Region Objectives

Advanced wireless technologies are an important element in the UK Government's ambition to build a more competitive and inclusive digital economy. The 5GIR Programme supports local authorities to accelerate the adoption of advanced wireless technologies in sectors aligned with local strengths. Its objectives are to drive economic growth through place-based innovation, stimulate commercial investment in advanced wireless technologies by demonstrating demand, and strengthen the 5G ecosystem through practical delivery and shared learning.

3.2.6. Ayrshire 5G Innovation Region Strategic Ambitions

Taking this policy assessment into account, a set of strategic priorities was established for the Ayrshire 5G Innovation Region, namely:

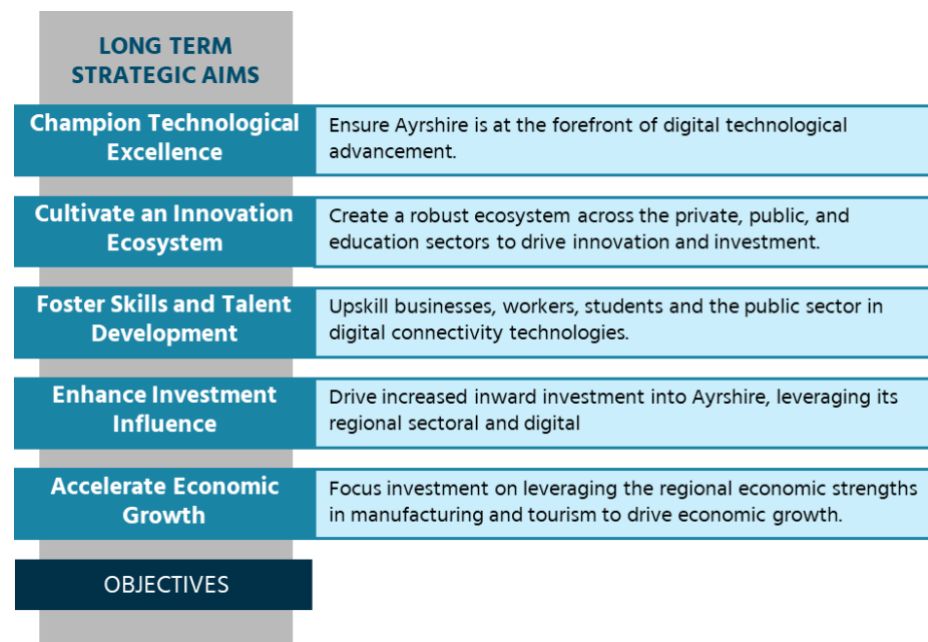


Figure 3: Ayrshire 5GIR Strategic Priorities (Source: Ayrshire)

3.3 Theory of Change

Good evaluation of policymaking requires an understanding of an intervention's objectives and how it is expected to achieve these outcomes. Subsequently, the Benefits Realisation process can be used to test the extent to which the intervention has the desired impact. Understanding the intervention is typically achieved by synthesising existing evidence and developing a theory of change.

This Benefits Realisation will adopt a linear Theory of Change approach (Figure 4) to understand the practical workings of the Ayrshire 5G Innovation Region. This approach will begin by outlining the problem the intervention addresses, the intended change, the expected causal chain of events leading to that change, the key stakeholders involved and affected, and the necessary conditions for success. It will also identify underlying assumptions and assess the strength of the evidence supporting them.

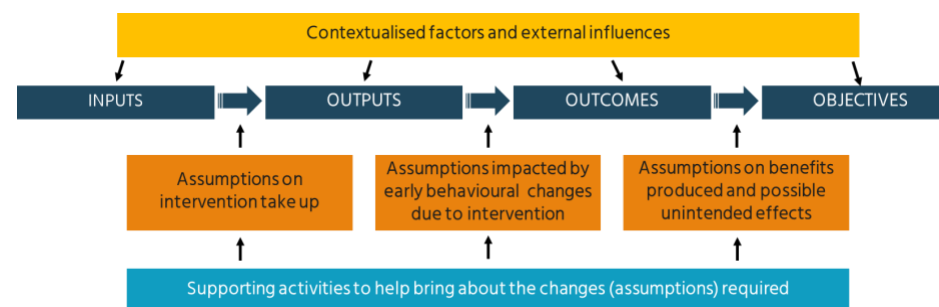


Figure 4: A Linear Theory of Change (Source: HMT Magenta Book)

This approach has been developed through workshops and extensive engagement with key project stakeholders throughout the project.

3.4 Benefits Realisation Matrix

The Benefits Realisation Matrix (Figure 5) has been developed to capture the principal outcomes and benefits of the Ayrshire 5G Innovation Region programme. It reflects the project's emphasis on establishing a lasting, sustainable digital ecosystem, supported by strong industry champions, to maximise growth and impact. Importantly, this approach is intended not only to deliver benefits during the lifetime of the programme, but also to secure enduring economic and innovation gains for the region beyond its completion.

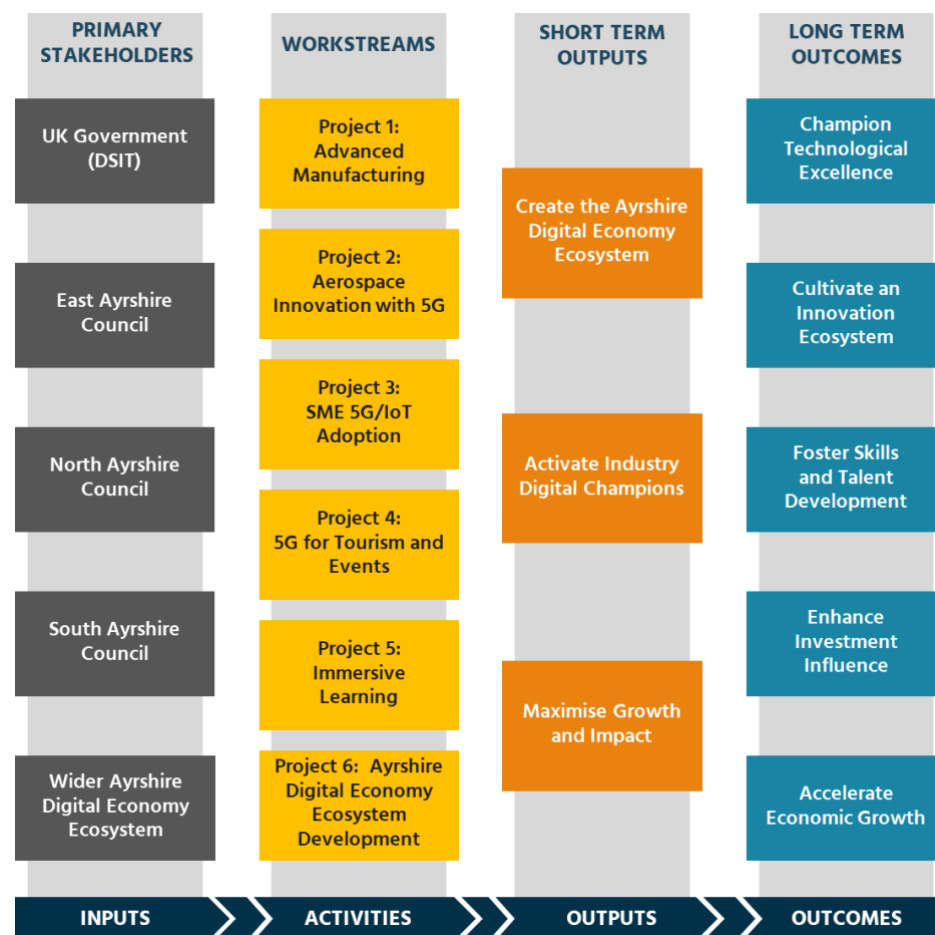


Figure 5: Ayrshire Benefits Realisation Framework (Source: FarrPoint)

3.5 Limitations

To ensure a clear understanding of the Interim Benefits Realisation, it's important to highlight the limitations and caveats that will shape its findings. These will be

explored in greater depth in the following section, through consideration of key lessons learnt, and are outlined here at the end of the methodology for completeness.

- Project Duration:** The short duration of the 5G Innovation Region programme, even considering the extension, creates a challenge for measuring the programme's true longer-term economic, social, and environmental impact as well as its impact on local authority processes. While some immediate benefits are observable, several anticipated outcomes – such as business and employment growth, and regional economic development – require a longer timeframe to materialise.
- Delivery Challenges:** The implementation of new technology encountered several challenges, including procurement delays and integration complexities. These technical difficulties may have influenced the extent to which the anticipated benefits could be realised. The need for user training and adaptation to new systems may have also impacted the overall effectiveness and efficiency of technology adoption.
- Understanding Technological Potential:** While stakeholder engagement has been strong, there have been challenges in fully articulating and evidencing the transformative potential of advanced connectivity and emerging technologies. In some cases, limited familiarity with use cases and long-term applications has made it more difficult to scope opportunities at scale or embed innovation within mainstream processes.

Given these limitations, the impact on many quantitative metrics in the Benefits Realisation Matrix is expected to be minimal. Therefore, this end-of-pilot evaluation report will also review additional Lessons Learnt and qualitative findings gathered throughout the pilot to assess its impact on the identified potential benefits.

4. Impact Analysis

4.1 Introduction

Throughout the programme, as part of the Benefits Realisation process, a series of indicators were assessed to monitor delivery and short-term impacts across all projects (contained within the *DSIT Project status, benefits and lessons learnt reporting* spreadsheet). This included tracking business engagement, use case deployment, improvements in connectivity infrastructure, skills development and knowledge transfer, evidence of productivity gains, inward investment, and the strengthening of collaborative networks across the region. Together, these measures provided a robust assessment of programme performance and early outcomes aligned to its core objectives of driving economic growth, accelerating commercial investment, and fostering an emergent advanced wireless ecosystem.

While these indicators provided an ongoing assessment of delivery against the programme's core objectives, this section now takes a broader, programme-wide perspective. For this evaluation, the overall programme impacts are grouped under three strategic themes:

- creating the Ayrshire digital economy ecosystem
- activating industry digital champions
- maximising growth and impact.

The following section assesses how the combined portfolio of interventions has contributed to structural change within the regional economy, strengthened innovation capacity, and positioned Ayrshire for sustained, long-term digital and economic transformation.

4.2 Create the Ayrshire Digital Economy Ecosystem

From the programme's outset, it was evident that digital adoption and transformation across Ayrshire were being pursued in a fragmented and uncoordinated manner. Local authorities, businesses and academic institutions were each progressing their own initiatives, but these efforts lacked alignment and strategic cohesion. This siloed landscape resulted in duplication in some areas, while other opportunities were underdeveloped or overlooked entirely. Consequently, the adoption of emerging digital technologies was uneven, and digital skills provision lacked consistency, leaving elements of the workforce and key sectors underprepared for technological change and reducing overall productivity and competitiveness.

A primary impact of the programme has therefore been the creation of the Ayrshire Digital Economy Ecosystem. Through a formal Memorandum of Understanding, partners have secured a long-term commitment to a shared vision for the region's digital future. This ecosystem approach has catalysed a step-change in Ayrshire's economic trajectory, fostering a culture of innovation, inclusion and digital ambition, and embedding advanced connectivity as the foundation for sustainable growth.

107 Knowledge dissemination and workshop events delivered, strengthening awareness, capability and collaboration across sectors.

220 Stakeholders engaged, spanning public bodies, private enterprises, academia and third-sector partners, demonstrating regional participation.

Together, these foundations have embedded digital capability across key sectors, strengthened regional capacity, and positioned Ayrshire on a future-ready growth pathway, enhancing its standing as a recognised hub for digital transformation.

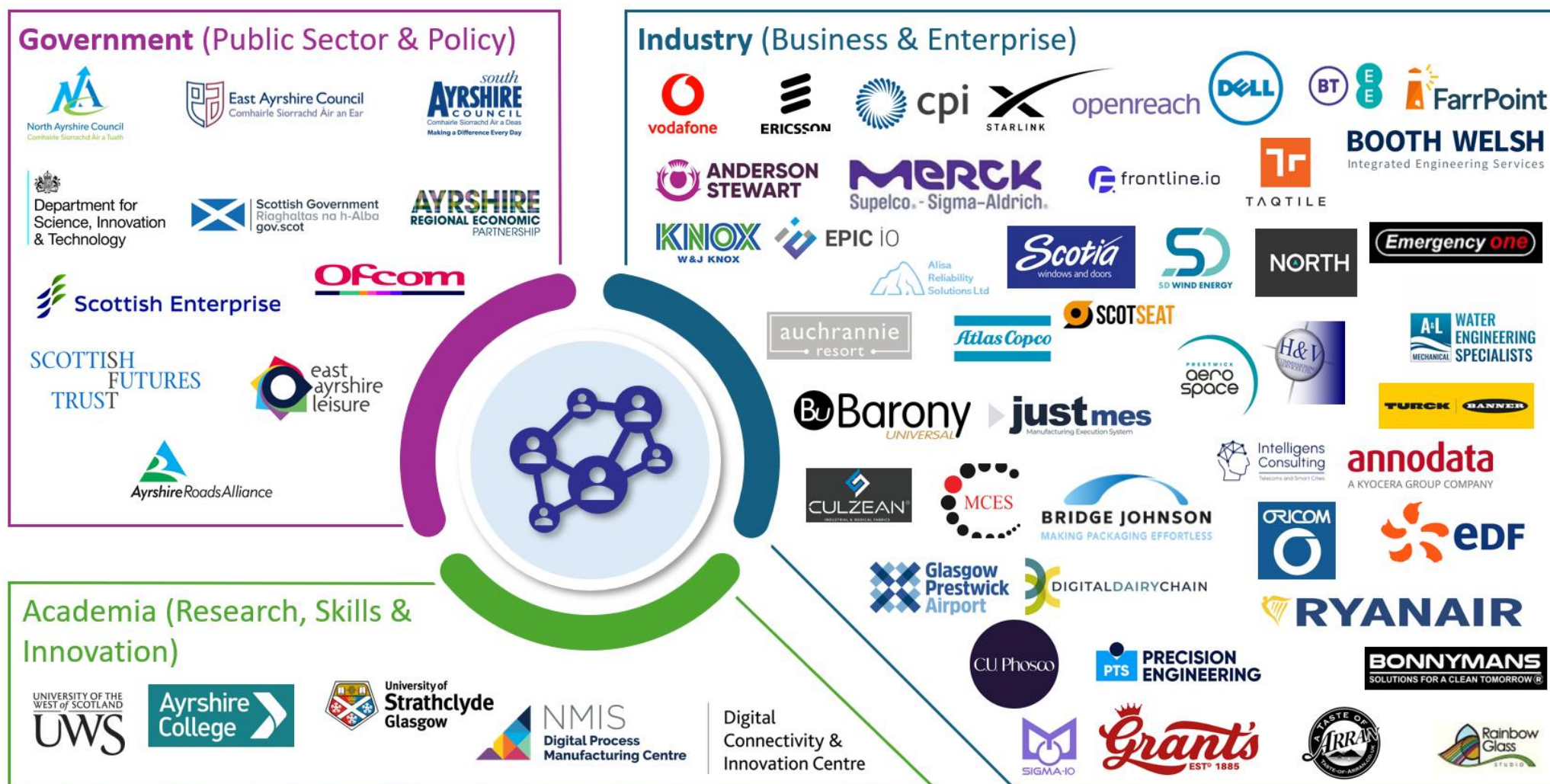


Figure 6: Ayrshire Digital Economy Ecosystem (Source: Ayrshire 5G Innovation Region)

4.3 Activate Industry Digital Champions

Given the programme's key objective to stimulate commercial investment in advanced wireless by demonstrating demand, the second key outcome of the Ayrshire 5GIR was to activate a number of core Industry Digital Champions across the region's key growth industries (Manufacturing, Aerospace and Tourism).

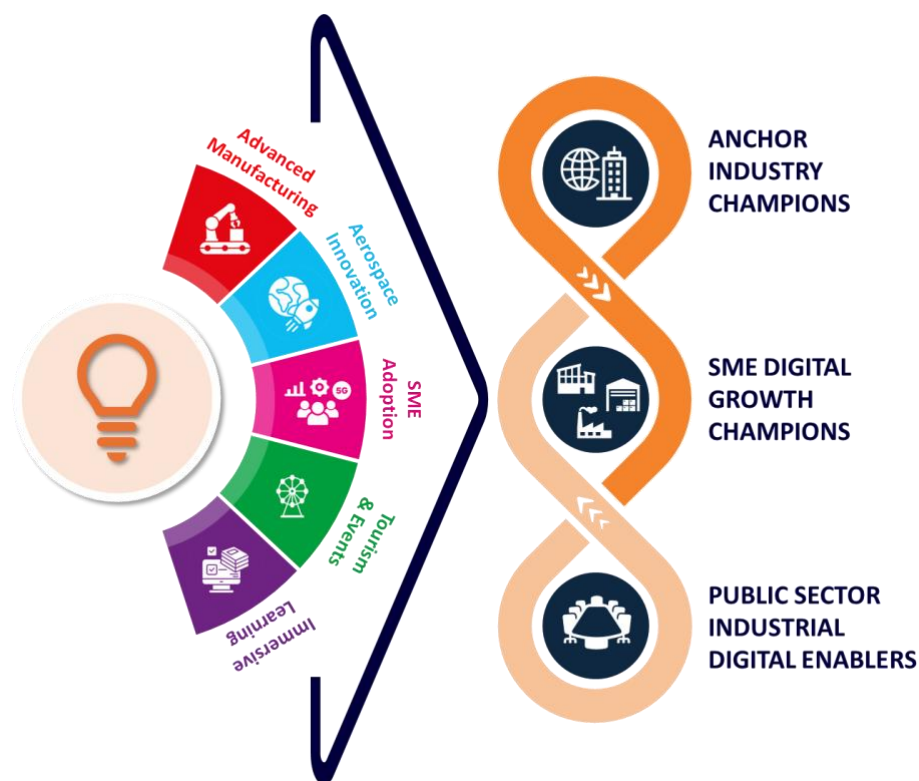


Figure 2: Ayrshire Industry Digital Champions (Source: Ayrshire 5G Innovation Region)

The individual project workstreams have leveraged Ayrshire's regional innovation centres - DPMC, DCIC, DIA - alongside the Tourism venues to create a diverse pipeline

of Industry Digital Champions, spanning multinationals, SMEs and the public sector, to lead the adoption of digital connectivity technologies and demonstrate their transformative value to the regional economy.



Anchor Advanced Manufacturing Champion – Merck is a leading pharma manufacturer with c.60,000 employees across 66 countries. This project uses a live 5G MPN to replicate a production environment, generating evidence-based insight into network performance in a high-volume setting. Following the experimentation phase, a detailed technical report and case study will be published to validate findings and share with the sector – this will form part of its long-term Digital Twin strategy.



Anchor Tourism Industry Champion – The introduction of high-speed, reliable Wi-Fi at Dean Castle has enhanced the visitor experience, while unlocking new opportunities for community engagement, commercial activity and expanded education and museum programmes. It is now a strong case study, demonstrating how improved connectivity can transform tourism venues and informing investment cases for better connectivity at other museums and exhibition spaces facing similar challenges.

Further anchor champions are emerging, set to build on these examples and amplify digital impact across Ayrshire's key growth sectors.

18 SMEs completed the Digital Innovation Accelerator Challenge, testing and showcasing advanced wireless solutions in SME settings, enabling peer learning and driving adoption across the regional business base.

22 Public Sector Industrial Digital Enablers upskilled to act as trusted intermediaries, connecting businesses to innovation support, enabling adoption and embedding digital capability in business engagement

4.4 Maximise Growth and Impact

Finally, programme activity must convert into place-based innovation that drives measurable growth. Advanced wireless adoption should deliver clear outcomes, including inward investment, decarbonisation and compliance, embedding scalable benefits for businesses and communities across Ayrshire.

Through the delivery of the Ayrshire 5G Innovation Region, a number of significant outputs have been established that will be sustained beyond March 2026:

25 **Advanced wireless network solutions** have been deployed, demonstrating the potential of 5G Mobile Private Networks, Wi-Fi, public 4G and 5G, LoRaWAN, and Low Earth Orbit (LEO) satellite.

32 **Innovative Use Cases** have been deployed and are now operating across these networks, delivering tangible benefits for businesses.

The programme has built a compelling case for increased private sector investment in connectivity and technology adoption across the region.

£1.6m **Accelerated investment from Vodafone**, who have brought forward and increased investment in improving connectivity across the region.

£360k **Crowded in SME match funding**, reinforcing private sector confidence and driving adoption of advanced wireless solutions.

For the SME sector, this investment has delivered a range of tangible benefits, many of which are captured in the project's case study reports. These case studies provide powerful, real-world evidence to share with businesses, demonstrating the value of investing in advanced wireless, such as:

*Up to 10% efficiency savings through improved team processes and reduced manual tasks. - **Dustacco Engineering***

*Reduced risk of human error and strengthened health and safety compliance through automated, real-time monitoring – **Auchrannie Resort***

*£12k reduction in paper consumption, 70% reduction in remake rates and 30 minutes saved on every window installation – **Scotia Windows and Doors***

*3 days of work per batch of fishing-net processing can be done in minutes through instant scanning and immediate data processing – **W&J Knox***

*96% process efficiency gains, saving 34 manual hours a week and unlocking up to £140k in weekly productive capacity – **Anderson Stewart Castings***

*£28k in direct labour savings due to better stock management, with improved data capture projected to increase output by 3% - **LandEnergy***

These case studies also highlight that several organisations already have plans for further digital expansion, signalling a clear pipeline of future opportunities that can build on the foundations established through this programme. And taken together, these combined effects provide a robust platform for sustained GVA growth.

Additionally, activity within the DCIC has positioned Ayrshire at the cutting edge of Aerospace R&D, unlocking the transformative potential of 5G O-RAN networks.

2 **Peer-reviewed research papers** were accepted and presented at key academic conferences, highlighting the industrial and aerospace applications of 5G.

However, A5GIR has not only focused on business investment in technology but also on ensuring the regional workforce has the skills to use these solutions, supported through engagement with further and higher education institutions.

200+ **Individuals upskilled** in digital and advanced wireless technologies, equipping them for the next wave of digital transformation.

In addition, the three flagship tourism venues have demonstrated the transformative potential of enhanced Wi-Fi and small-cell private 5G solutions, showcasing how connectivity can elevate the visitor experience and operational performance.



Ayr Low Green - Upgraded connectivity delivered resilient, high-capacity Wi-Fi to support enhanced visitor experience at major events. During the 2025 Ayrshow alone, the network supported over 4,000 active connections and 425GB of data usage, demonstrating strong demand and the platform's potential to power smarter large-scale events.



Dean Castle County Park - Enhanced connectivity improved staff communications, safety and visitor experience, while enabling reliable payments and increased revenue. The East Ayrshire Leisure Trust highlighted that, *"The introduction of high-speed, reliable connectivity within Dean Castle Country Park has opened up the opportunities for community engagement, commercial growth, future development of the education and museum programme and overall, a better customer journey for our visitors from across the world!"*



Irvine's Great Harbour Maritime Mile - Improved connectivity has strengthened public safety, with the Council's Public Protective Services stating, *"The newly installed infrastructure has enhanced our ability to support partner services across the Irvine Harbourside and Irvine Beach areas, enabling more responsive and better coordinated operational collaboration with Police Scotland and other partners, particularly during busier periods"*. It has also laid foundations for future public Wi-Fi, environmental monitoring and immersive tourism, positioning the waterfront as a digitally enabled destination.

The impact has been strengthening the economy through business, infrastructure and investment effects. Businesses adopting wireless have achieved productivity gains, reduced downtime, improved efficiency and unlocked revenue opportunities. These gains have increased competitiveness, contributing to regional economic growth while supporting longer-term resilience across key growth sectors.

This impact is reinforced by the strategic capital investment in digital infrastructure. The deployment of private networks, enhanced connectivity and innovation hub testbeds has expanded Ayrshire's productive capacity and created shared digital assets that support experimentation, commercialisation and scaling. These investments represent durable economic enablers, reducing the cost and risk of innovation and embedding advanced connectivity in real operating environments.

In parallel, the programme has catalysed wider market confidence and accelerated additional connectivity investment, most notably through Vodafone's expanded capital deployment across the region. This crowding-in effect strengthens overall network performance, improves coverage, and enhances reliability for the broader business community, extending meaningful benefits beyond direct participants and reinforcing Ayrshire's attractiveness as a digitally enabled investment location.

£7.76m **GVA impact** across business productivity gains, capital infrastructure investment and leveraged private sector funding (with P1: £0.8m, P2: £1.0m, P3: £1.8m, P4: £0.6m, P5: £0.5m, P6: £0.5m, and additional Vodafone investment securing £2.4m Gross Value Added impact)

Taken together, these combined effects provide a robust platform for sustained GVA growth. With infrastructure established, partnerships embedded, and adoption underway, Ayrshire is well-positioned to scale activity further and translate its digital foundations into long-term, inclusive economic expansion.

5. Key Lessons Learned

5.1 Introduction

While the Ayrshire 5G Innovation Region has delivered measurable infrastructure, ecosystem and economic impact, it has also generated valuable delivery insights to inform future place-based digital programmes. The lessons fall into five core themes: the need for business-led design anchored in real operational demand; more agile procurement and commercial frameworks; stronger upfront technical planning and integration; structured change management to support adoption; and effective ecosystem coordination to ensure long-term sustainability.

5.2 Business-Led Design and Demand-Led Innovation

Successful delivery consistently depended on aligning advanced wireless solutions with clearly articulated business needs. Projects that began with operational challenges, rather than technology capability, achieved stronger engagement, clearer impact pathways, and more credible long-term investment cases.

 **Start with challenges, not technical solutions:** Early engagement often focused on network performance characteristics rather than a clearly defined understanding of what the problem was that needed to be fixed. Stronger outcomes were achieved when business problems were mapped first, with advanced wireless solutions positioned explicitly as enablers of measurable operational improvement.

 **Demonstration quantified impact:** Businesses were significantly more engaged when use cases demonstrated tangible performance improvements, such as reduced manual processing time or increased throughput. Embedding

impact measurement frameworks early ensures demonstration sites translate into credible return-on-investment cases capable of driving wider adoption.

 **Awareness and capability gaps remain significant barriers:** Many organisations, especially SMEs, initially perceived 5G as a consumer connectivity upgrade rather than an industrial productivity tool. Structured workshops and peer engagement were required to reframing advanced wireless as a strategic operational enabler across manufacturing, aerospace, and tourism environments.

 **Intermediaries are critical to scaling adoption:** Upskilled Local Authority digital and economic advisors played a pivotal role in translating technical solutions into economic outcomes. Strengthening these intermediary capabilities improved business engagement quality and created a scalable pathway for embedding digital adoption across the wider regional ecosystem.

5.3 Procurement, Commercial Models and Governance

The programme highlighted structural friction between traditional public sector procurement mechanisms and the agility required for emerging digital technologies. Innovation delivery requires commercial and governance models that are adaptable, technically informed and aligned to pilot-based experimentation.

 **Existing procurement frameworks lack sufficient agility:** Standard public procurement routes struggled to accommodate complex and evolving technical specifications. Detailed pre-tender requirement gathering, flexible evaluation criteria and early supplier engagement are necessary to ensure deployed solutions are technically robust and aligned to operational needs.

- ! **Commercial models can constrain innovation delivery:** In tourism and events contexts, viable technical solutions existed but were constrained by unsuitable commercial structures, particularly for free public events. This demonstrated that innovation barriers are frequently commercial rather than technological, requiring alternative funding or partnership models.
- ! **Funding complexity must be addressed at inception:** Subsidy control requirements, VAT treatment within further and higher education, and delayed grant payments created delivery friction. Early financial and legal alignment across all delivery partners is essential to minimise disruption in time-limited innovation programmes.
- ! **Supplier alignment requires proactive management:** Commercial tensions emerged where supplier expectations did not fully align with pilot objectives. Clear articulation of innovation requirements, realistic timelines and structured communication frameworks are critical to ensure suppliers are configured for experimental, rather than purely commercial, deployment models.

5.4 Technical Design, Infrastructure and Integration

Advanced wireless deployment is heavily dependent on underlying infrastructure readiness, integration capability and detailed technical planning. Successful implementation required a holistic consideration of connectivity architecture beyond the radio layer.

- ! **Infrastructure dependencies must be fully scoped early:** Backhaul provision, power supply, equipment siting and Ofcom spectrum licensing materially influenced timelines and performance. Comprehensive dependency mapping

at project inception is critical to avoid delays and ensure solutions are aligned with site-specific operational constraints.

- ! **Integration complexity is frequently underestimated:** Multi-vendor deployments and legacy infrastructure environments introduced interoperability challenges. Early cross-vendor technical workshops and integrated architectural planning sessions significantly reduced deployment risk and improved operational performance once systems became active.
- ! **Coverage modelling and Radio Frequency (RF) planning are essential foundations:** Wi-Fi site surveys and LoRaWAN coverage assessments revealed performance gaps that would have constrained use case functionality. Connectivity master planning, including detailed RF modelling, should be treated as a prerequisite for scalable advanced wireless deployment.
- ! **Avoid over-engineering network solutions:** Often, advanced features (e.g., Micro-Edge Computing) were unnecessary and involved avoidable cost. Network architecture must be proportionate to actual business needs rather than based on assumed technical capability requirements.

5.5 Organisational Readiness and Change Management

Technology deployment alone does not guarantee impact. Organisational readiness, workforce capability and cultural alignment significantly influence whether advanced wireless solutions translate into sustained operational improvement.

- ! **Digital transformation requires structured change management:** Transitioning from manual or paper-based workflows to connected digital systems created operational adjustment challenges. Phased rollouts, lean

process mapping, and regular communication were required to maintain staff engagement and ensure adoption translated into measurable performance improvement.

- ! **Innovation requires protected organisational capacity:** Businesses and public sector teams frequently struggle to balance business-as-usual demands with innovation activity. Clear scope definition, buffer time and dedicated internal resource allocation are needed to sustain project momentum and prevent delivery fatigue.
- ! **Not all stakeholders are innovation-ready:** Some initially engaged organisations were unable to participate fully due to shifting strategic priorities or limited operational readiness. Early assessment of organisational commitment, resource capacity and strategic alignment reduces programme risk and improves delivery certainty.
- ! **Short timelines limit measurable economic realisation:** While infrastructure and ecosystem foundations were successfully established, broader productivity and GVA impacts require longer time horizons. Funding windows should better align with economic realisation cycles to fully capture transformational impact.

5.6 Ecosystem Coordination and Long-Term Sustainability

Beyond individual deployments, the programme demonstrated that ecosystem-wide coordination is fundamental to sustained digital transformation. Infrastructure investment must be accompanied by structured governance, collaboration mechanisms and long-term strategic commitment.

- ! **Ecosystem coordination requires formal governance structures:** Cross-sector collaboration did not occur organically. Clearly defined roles, formal agreements and confirmed resource commitments were necessary to align public, private and academic stakeholders around shared regional digital objectives.
- ! **Infrastructure is a platform, not an outcome:** Network deployment alone does not generate economic growth. Structured business engagement pipelines are required to convert demonstration capability into adoption, productivity improvements and sustained GVA contribution.
- ! **Visible demonstration strengthens inward investment confidence:** Operational private networks, research infrastructure and live use cases enhanced Ayrshire's credibility as a digitally enabled region. This signalling effect supports inward investment cases and strengthens market confidence in regional digital capability.
- ! **Economic transformation depends on continued scaling:** The programme successfully established infrastructure and adoption foundations; however, sustained productivity growth and employment impact will depend on continued business engagement, scaled adoption and ongoing private sector investment beyond the pilot phase

6. Conclusion

The Ayrshire 5G Innovation Region has delivered a clear impact on the region. While the programme has successfully deployed advanced wireless infrastructure and delivered live use cases across multiple key growth sectors, its principal achievement has been systemic rather than technical. **It has created the conditions for sustained digital adoption and transformation at a regional scale.**

From an evaluation perspective, the most significant outcome has been progress toward the ambition to **create the Ayrshire Digital Economy Ecosystem**. At the outset, digital activity across Ayrshire was fragmented and lacked coordination. Through structured collaboration, shared governance, and alignment across public, private, and academic partners, the programme has moved the region from isolated digital initiatives to a more cohesive, strategic approach. Advanced wireless is now embedded within sector development, business support and skills planning, ensuring that connectivity deployment supports wider economic objectives rather than remaining a standalone intervention. Evidence from stakeholder engagement, business participation and cross-sector activity demonstrates that digital transformation is now more coordinated, visible and strategically aligned.

The programme has also **activated a diverse range of Industry Digital Champions**. Adoption accelerates when businesses can see practical examples of technology delivering results. Through demonstrator environments in advanced manufacturing and aerospace, and enhanced connectivity across flagship tourism venues, organisations have been able to test and apply advanced wireless solutions in real operating environments. SMEs supported through grant funding have evidenced measurable improvements in efficiency, cost management and process performance. These examples provide credible, peer-led validation that digital investment can

generate tangible returns, thus reducing perceived risk and encouraging wider uptake across the regional business base.

In parallel, the programme has **maximised growth and impact for the region** by linking infrastructure deployment to business performance, skills development and investment. Connectivity upgrades have been accompanied by structured engagement with businesses, workforce upskilling and match funding from the private sector. This integrated approach has strengthened the region's capacity to absorb and scale innovation. Enhanced connectivity in tourism and events has improved operational resilience and visitor experience, while manufacturing and aerospace demonstrators have positioned Ayrshire as an environment where advanced connectivity can be explored and commercialised. Leveraged private investment further reinforces growing confidence in the region's digital capability.

Importantly, these longer-term economic impacts will continue to materialise beyond the programme period. However, the foundations now in place significantly increase the likelihood of sustained benefits. The combination of infrastructure, demonstrator environments, skilled intermediaries, and collaborative governance creates a durable platform for continued adoption and scaling.

Taken together, the evidence shows that the Ayrshire 5G Innovation Region has moved beyond delivering individual projects to establishing a coordinated model of digital transformation. By creating a connected ecosystem, activating credible champions and translating connectivity into measurable business and skills outcomes, the programme has embedded digital ambition within the region's economic trajectory. **Its legacy is not simply infrastructure but a scalable, collaborative ecosystem capable of sustaining region-wide digital adoption and long-term economic renewal.**

Version Control

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