

5G Innovations Regions

Transforming Communities with 5G-
Enabled Innovations

BT collaboration

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Executive summary

In the future, communities connected with BT's technology will be advanced and integrated environments, using high-speed, low-latency communication to enhance urban and rural life.

BT operates the UK's largest 4G and 5G mobile network, with a strong emphasis on security and innovation.

The paper emphasizes our commitment to innovation and our capability to lead in delivering 5G promises. It discusses verticals for 5G funding and suggests use cases that add value to communities. However, the successful realization of 5G use cases depends on robust physical and digital infrastructure.

Physical infrastructure includes wireless and fixed networks, devices, and sensors, forming a data transmission foundation. Digital infrastructure involves software-defined networks, edge computing, and algorithms for real-time communication and IoT.

Our infrastructure strategy supports 5G-enabled solutions with technologies like IoT, edge computing, and open networks supported by digital and data platforms to deliver relevant use cases. Our collaboration through the 5GIR call will enable successful integration of 5G into communities for tangible outcomes aiming to transform public services, stimulate growth, and foster innovation through advanced wireless technologies.

However, the success of 5G goes beyond showcasing its potential use cases; its true achievement hinges on widespread adoption of the technology. Effectively conveying the ways in which 5G can elevate the lives of individuals, enhance business efficiency, and positively impact various industries is essential in generating interest, driving demand for its implementation and increase adoption of the technology.

The purpose of this paper is to outline how BT, as a leading telecommunications service provider, can collaborate with local authorities to harness the transformative potential of 5G technology. Our vision is to empower local communities with cutting-edge solutions, revolutionizing public services, stimulating economic growth, and fostering innovation across diverse sectors through the strategic deployment of advanced wireless technologies.

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1 Introduction

The purpose of this paper is to outline how BT, as a leading telecommunications service provider, can collaborate with local authorities to harness the transformative potential of 5G technology in combination with other commentary technologies such as LPWAN, NB IoT, WiFi etc.. Our vision is to empower local communities with cutting-edge solutions, revolutionizing public services, stimulating economic growth, and fostering innovation across diverse sectors through the strategic deployment of advanced wireless technologies.

While everyone is talking about technologies for local communities, we are taking a user-centric approach. We are first focusing on the use cases and value to citizens in order to understand the challenges we are trying to address and then we tailor our technology solutions to deliver tangible outcomes and best value to local communities. This approach ensures successful implementation, faster adoption and a practical approach to innovation.

We envisaged that in the future, a local community connected with BT's technology will be a technologically advanced and seamlessly integrated environment that leverages the power of high-speed, low-latency communication to enhance various aspects of urban and rural life. Although the vision for connected communities is still in developing there are some examples around the world that can bring to life the experiences that wireless technology can bring to local communities and some of them are discussed in the followings.

Smart Transportation: Traffic management systems powered by our 5G technology will enable traffic management driven by data insight and reduce congestion and environmental impact. In the future when vehicles will be able to communicate with one another and with traffic infrastructure, our technologies will enable traffic flow optimisation and enhancing road safety.

Immersive Experiences: The high data speeds and low latency of 5G will facilitate immersive experiences through augmented reality (AR) and virtual reality (VR) technologies. Citizens will enjoy enhanced entertainment, education and training experiences that bridge the digital and physical realms.

Enhanced Public Services: Public services will be more efficient and responsive, leveraging data insights from connected devices to offer personalized solutions. Healthcare will see remote diagnostics and telemedicine flourish, while city infrastructure will respond to changing conditions in real-time, improving energy efficiency and waste management.

Urban Planning and Design: Urban planners will use our data analytics to create more sustainable and user-friendly cities. Traffic patterns, energy consumption, and public space utilization will be continuously monitored and analysed, enabling better decisions for resource allocation and city development.

Smart Grids and Energy Management: 5G connected smart grids will ensure optimal energy distribution, integrating renewable sources seamlessly. Consumers will have real-time insights into their energy consumption, allowing them to make informed choices about energy use and cost savings.

Security and Surveillance: High-definition video surveillance and real-time monitoring will enhance public safety. Advanced facial recognition and object tracking technologies will help law enforcement respond to incidents more efficiently.

Sustainability and Efficiency: With optimized resource management and energy consumption, the local authority will contribute to reduced environmental impact and increased sustainability. Data-driven insights will help identify areas where efficiency can be improved, leading to reduced waste and a smaller carbon footprint.

In essence, a local community connected with 5G will be characterized by seamless connectivity, real-time data insights, enhanced services, and improved quality of life. This vision of the future city is centred around technology working harmoniously to create a safer, more efficient, and more sustainable urban environment for all its residents.

Nevertheless, the success of 5G goes beyond showcasing its potential use cases; its true achievement hinges on widespread adoption of the technology. Effectively conveying the ways in which 5G can elevate the lives of individuals, enhance business efficiency, and positively impact various industries is essential in generating interest, driving demand for its implementation and increase adoption of the technology.

In section 3 we list some examples of use cases for urban and rural communities and provide some examples where we worked to deliver them while in section 5 we are proposing a collaborative approach to identify local needs before planning to technology solution that address the local needs. Section 2 and section 4 discuss BT capabilities whilst section 6 highlights some of the expected outcomes and section 7 the engagement approach.

2 Why BT

BT stands as a pioneer in the telecommunications industry, having extensive experience, resources, and a proven track record in successfully implementing large-scale technology initiatives.

We operate the biggest and fastest 4G and 5G mobile network in the UK and were awarded UK's best network for 10 years in a row by RootMetrics®. BT owns and operates the largest WiFi network in UK and has already committed to extend its FTTP footprint to 25m premises by end of 2026¹. We are virtualising our platforms and we are building data and AI to deliver future use cases and offer flexibility to integrate new customers, business models and applications. We blend cutting edge data science with machine learning to analyse the location, movement and web and app behaviours of target demographics.

Cyber security is at the heart of everything we do and we have experts, technology and intelligence to measure risk across all attack vectors and spot and tackle threats. We have 16 accredited global security operating centres, we prevent 6,500 cyber attacks every day supported by over 3500 security experts offering 24/7 coverage.

Research and Development are fundamental to us with our Adastral Park R&D facility at the centre of this. We are doing world-leading research into AI, 5G mobile innovation, machine learning, Quantum Key Distribution, IoT, digital security, future of TV and engage with Academia and Industry to focus and refine our research in order to make it relevant to our customers. We're constantly building on the 5,200 patents in our portfolio, creating new products that quietly reverberate around the globe.

Our networks, technologies and capabilities offer not only a connectivity layer, but also a service platform that can integrate data from various sources and use them to drive applications and services across several industries.

Our unwavering commitment to innovation, combined with a nationwide network infrastructure, uniquely equips us to lead the charge in delivering the promises of 5G technology to your communities.

2.1 Vision and Rationale

Our vision is to empower local authorities to spearhead digital transformation within their regions. By harnessing the capabilities of 5G, we aim to elevate residents' quality of life, stimulate economic development, and establish sustainable ecosystems that foster innovation and prosperity.

¹ [BT to increase and accelerate FTTP build to 25m premises by the end of 2026 \(https://newsroom.bt.com/bt-to-increase-and-accelerate-ftp-build-to-25m-premises-by-the-end-of-2026/\)](https://newsroom.bt.com/bt-to-increase-and-accelerate-ftp-build-to-25m-premises-by-the-end-of-2026/)

2.2 Geographic Scope & scale

Our proposed collaboration will span a diverse range of geographic areas, encompassing urban centres, suburban regions, and remote rural communities through our national infrastructure networks. According to OFCOM², EE/BT's 4G network covers 99% of premises and 86% of UK geographic landmass- the highest geographic coverage from all four MNOs. With participation in the Shared Rural Network (SRN) project, we are aiming to improve UK mobile geographic coverage by 95% of UK landmass by 2025. Our 5G coverage is growing aiming to reach [90% landmass by 2028](#)³.

Our approach is tailored to the distinct characteristics and needs of each locality, ensuring equitable access to the benefits of 5G technology and our scale allows us to replicate models across different localities achieving a sustainable model for 5G deployment for the UK ecosystem development.

2.3 Alignment with Broader Priorities

Our approach discussed in this paper resonates seamlessly with 5GIR call strategic priorities, aligning perfectly with the vision for enhanced public services, accelerated economic growth, and the cultivation of innovation hubs within local communities. Our 5G-enabled use cases are meticulously designed to complement efforts in fostering smart communities, nurturing rural industries, modernizing transportation, advancing manufacturing and catalysing creativity.

² Connected Nations 2021 UK Report

³ <https://newsroom.ee.co.uk/ee-to-offer-5g-solutions-across-the-entire-uk-as-bt-group-unveil-new-mobile-and-convergence-ambitions/>

3 Examples of use cases for the 5GIR call for proposals.

The 5GIR specifies verticals to consider in applying for funding aiming to drive specific sector use cases. Although the use cases will be driven by the local requirements, in this section we offer some ideas of related use cases we have been involved or currently are working or have seen in other countries that deliver value to urban communities.

3.1 Urban environments implementations

The integration of 5G technology into urban environments opens up a wide array of transformative use cases that enhance urban living, improve efficiency, and create new opportunities. Some of the examples follow.

IoT-Enabled Waste management services: deploy IoT sensors for optimized waste collection schedules and reducing costs and environmental impact.

Smart Street Lighting: Implementing intelligent lighting systems that adjust based on ambient light levels, enhancing safety and energy efficiency.

Environmental Monitoring: Real-time data collection and analysis for proactive urban planning and sustainable development.

Citizen Engagement Platforms: Empowering residents with digital platforms for community engagement, feedback, and participation in local governance. For example, a mobile app for residents to engage with local government, report issues, and access services seamlessly.

Public Safety: Deploying cameras, IoT and drones for rapid response and situational awareness in emergencies, improving public safety and disaster management.

Education Remote learning and collaboration: 5G enables seamless, high-quality video streaming and conferencing, enhancing remote learning experiences. Students can participate in real-time virtual classrooms, collaborate on group projects, and engage in interactive discussions with teachers and fellow students from different locations.

Education Virtual Reality (VR) and Augmented Reality (AR) Learning Environments: 5G can revolutionize education by providing the high-speed, low-latency connectivity needed for immersive virtual reality (VR) and augmented reality (AR) learning experiences. Students can engage with 3D models, interactive simulations, and virtual field trips, enhancing their understanding of complex subjects.

Health and social care: 5G allow patients to receive medical consultations and diagnostics from home, reducing the need for physical visits to healthcare facilities, especially in rural or underserved areas, reducing bed blocking and unnecessary visits at the hospital.

Social care Elderly Care and Remote Monitoring: 5G technology can enhance social care services, particularly for the elderly. Smart homes equipped with sensors and connected devices

can monitor vital signs, daily activities, and movement patterns of elderly individuals. Caregivers and family members can receive real-time alerts and updates, ensuring the well-being of seniors. 5G's reliability and low latency are crucial for ensuring prompt response times in emergency situations.

Social care emergency response and location tracking: 5G's low latency and high reliability are crucial for enabling rapid emergency response and location tracking. In cases of accidents or emergencies, 5G-connected devices can transmit precise location information and critical health data to first responders and healthcare providers, ensuring timely assistance and potentially saving lives.

3.1.1 BT credentials

BT is actively involved in the development of connected communities, leveraging 5G technology to enhance urban living. Examples of activities we are involved follow:

- **Surveillance and smart solutions**⁴: We are working with Local Authorities and customers to deliver outcomes driven by efficient and informed data-driven decision making for operational management, enhanced safety and security and actionable intelligence and insights enabled by smart solutions. We provide a hybrid fixed, mobile and private 5G network that guarantees ubiquitous coverage, enables customisation to specific service requirements and integrated to other on-premise digital technologies. Our dedicated infrastructure provides cyber-secure connectivity and offers enhanced integrated view and meta-data of what's happening on the wider estate from the physical security, real time alerts and alarms and enhanced health and safety assessment. Smart solutions are essentially about integrating technology to help authorities run public services in a canner fashion. Smart technology can drive efficiencies, open up options for businesses, and improve the lives of communities and visitors. We can help you select from the huge range of cameras, sensors and integrated information feeds to make sure your smart services deliver what you need.
- **Revitalising high street: We will conduct technical and commercial pilots to convert or upgrade our street cabinets for electric vehicle charging units**⁵. The pilots will provide critical insight into the viability to scale EV charging to more locations across its estate. The cabinets are currently used for providing copper-based broadband and phone services, and will be decommissioned as the ambitious nationwide upgrade to full fibre progresses.
We are partnering with local authorities in towns and cities across the UK to boost mobile coverage by mounting **small cell antennas**⁶ on street furniture such as lampposts and CCTV columns.

⁴ <https://business.bt.com/corporate/products/enabling-your-places/protect/surveillance/smart-cities/>

⁵ <https://newsroom.bt.com/bt-group-to-launch-electric-vehicle-charging-pilots/>

⁶ <https://newsroom.bt.com/bt-partners-with-local-authorities-to-boost-mobile-coverage-in-uk-towns-and-cities/>

Our combined activities for EV charging and small cell deployment can enable not only local connectivity and net zero execution, but also revitalise the high street by providing smart infrastructure (such as multiuse columns) that are set against local priorities, such as reducing emissions by environmental testing as well as increasing footfall to commercial areas via 5G supported IoT applications. Other benefits include:

- More reliable and stable mobile broadband internet connections to areas that suffer from poor connectivity (a key issue in areas with numerous coverage/capacity not-spots);
- Almost instantaneous data transfer and high-speed connections;
- Delivery of ‘smart’ cities and services (i.e. electronic monitoring of bins, environmental detection and video surveillance (CCTV) with virtually zero latency, and efficient transport services);

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 - Almost instantaneous data transfer and high-speed connections;
 - Delivery of ‘smart’ cities and services (i.e. electronic monitoring of bins, environmental detection and video surveillance (CCTV) with virtually zero latency, and efficient transport services);
- **Education and remote learning**⁷ BT Immersive Spaces simulate real-life environments for business and public sector organisations – including education, healthcare, retail, transport, tourism, manufacturing, construction and sport. The fully immersive rooms are connected to the EE mobile network, using cameras and HD projectors to bring 360° content to life across the space’s walls and floor. Inside the space, users can experience real-life or imagined scenarios in detail, and add interactive elements – virtually transporting themselves into simulated environments, augmented with lights, sounds, and even smells. Initial customers for BT Immersive Spaces include Borders College in Galashiels, Scotland and Cadoxton Primary School in South Wales. Both are using the technology to create fully immersive and interactive classrooms. [A partnership with North Lanarkshire Council](#)⁸ has introduced the first 5G-enabled immersive classroom in Scotland. Powered by BT’s EE 5G network, digital projection across all four walls and the ceiling has transformed a room in the Muirfield Community Centre in Cumbernauld into a 360-degree immersive learning environment. Accessible to all local students, the immersive experience supports inclusive education, helping those who may respond better to more modern methods of teaching, such as requiring more visual engagement.

⁷ <https://newsroom.bt.com/bt-launches-immersive-spaces-the-uks-first-5g-enabled-interactive-simulation-experience/>

⁸ <https://www.localgov.co.uk/Why-partnerships-are-key-to-enabling-inclusive-growth-and-closing-the-digital-divide/53097>

It also provides access to a wider range of learning resources that aren't limited by physical boundaries or schools' digital equipment.

- **Digital skills for tomorrow⁹**: BT is working with Leeds City Council to drive inclusive growth across the region and help combat the digital divide in its most disadvantaged communities. Its “Local Full Fibre Programme” aims to give the city’s 285 schools access to the best possible connectivity, as well as installing the technology at 293 council-owned buildings, 156 NHS properties, and council housing across the city. In addition, the partnership will support the roll-out of 5G mobile coverage to 70 percent of the area by 2023, including approximately 81 percent of the city’s council houses, thereby making Leeds the largest “5G capable” city outside of London. Building on the success of the “100% Digital Leeds programme”, BT is also supporting a number of digital inclusion activities across the city. Its “Skills for Tomorrow” programme seeks to empower young children, unemployed and vulnerable people with digital skills to make the most of technology. BT is helping to ensure that the growth that comes from a more digital way of thinking is inclusive of all and leaves no one behind.
- **Health and Social Care¹⁰**: We work with healthcare organisations to offer a range of services supporting them in their Digital Transformation. For example, [BT virtual wards programme¹¹](#) aimed at healthcare customers across the UK. The move is part of BT’s ambition to work together with the NHS to build smarter, safer, more efficient services for everyone. Virtual wards give patients access to the healthcare services they need remotely, safely and conveniently, outside of a hospital setting. From smart devices that monitor health conditions like COPD and heart disease, to AI-backed software that enables clinicians to perform virtual ward rounds, the new solutions are now available for BT’s customers in the healthcare sector. The technology is used across care homes, community nursing and virtual wards.
The cloud is crucial to the future of the NHS, helping you deliver patient-centred, digitised care. Our [hybrid Health Cloud¹²](#) solutions give you the flexibility to host workloads and data where it’s most appropriate, so you can increase efficiency and security while supporting patients and staff.
- **Smart city climate and environment¹³**: BT has selected tech scale-ups, iOpt and Everimpact, to develop new joint products and services aimed at helping its public sector customers drive a green recovery by transitioning to Net Zero. iOpt will be using its Internet of Things (IoT) platform to enable smart buildings, with a focus on improving the quality of social housing for local councils. Installed sensors will enable key information such as damp, mould, and fuel poverty to be collated and tracked in their IoT platform. iOpt’s solution can assist councils with social regeneration and deliver improved health and well-being outcomes for tenants. Further benefits for councils include lower

⁹ <https://www.localgov.co.uk/Why-partnerships-are-key-to-enabling-inclusive-growth-and-closing-the-digital-divide/53097>

¹⁰ <https://business.bt.com/public-sector/organisations/health/>

¹¹ <https://newsroom.bt.com/bt-launches-virtual-ward-programme-to-help-transform-uk-health-services/>

¹² <https://business.bt.com/public-sector/organisations/health/health-cloud/>

¹³ <https://newsroom.bt.com/bt-expands-green-tech-platform-to-target-scale-ups-to-help-manufacturers-reach-net-zero/>

preventative maintenance costs and cutting down unnecessary travel to fix issues, reducing carbon emissions.

- [Driving towards net zero targets for local communities](#)¹⁴: We have partnered with the University of Hertfordshire to transform Hatfield Business Park into an innovation centre for smart technology. The county council's Hertfordshire Living Lab project is designed to facilitate experimental services and explore how future communities can use digital technologies such as driverless cars, drones, and robots to enhance and deliver a more sustainable way of life. A change in culture is needed to amend how things have always been done, so smaller steps taken at innovation hubs provide a look into the future. We are exploring breakthrough innovations to support the public sector is our [Green Tech Innovation Platform](#)¹⁵. The initiative, launched in June 2020 in partnership with US-based innovation platform Plug and Play, was designed to uncover new sustainable technologies which can help the public sector achieve its net zero carbon emissions. To date, it has focused on three areas: smart streets; smart buildings; and remote working – technologies that could potentially transform local communities for the better.
- [Digital transformation of public services](#)¹⁶: We are working and supporting our customers on Digital Transformation journey offering services, tools and enablers to explore modern technologies such as [cloud-based systems](#)¹⁷ and [artificial intelligence](#)¹⁸, combined with [smart devices and appliances](#)¹⁹, and incorporating these within the running of your local governance.

3.2 Rural Connectivity

5G technology has the potential to revolutionize rural areas by bridging the digital divide, improving connectivity, and enabling new services. Examples of use cases follow.

Internet Access and Digital Inclusion, Community Engagement and E-Government services:

5G can bring high-speed internet access to remote and underserved rural areas, bridging the digital divide. This enables residents to access online education, healthcare services, job opportunities, and e-commerce, contributing to overall digital inclusion. 5G connectivity allows rural residents to engage in remote work and online entrepreneurship, creating economic opportunities that were previously limited by connectivity constraints. 5G-powered apps and platforms can foster community engagement by connecting residents, local businesses, and community organizations, facilitating communication, event coordination, and access to local services.

¹⁴ <https://newsroom.bt.com/placing-sustainability-at-the-heart-of-public-sector/>

¹⁵ <https://newsroom.bt.com/bt-partners-with-scale-ups-on-breakthrough-green-tech/>

¹⁶ <https://business.bt.com/why-choose-bt/insights/digital-transformation/>

¹⁷ <https://business.bt.com/products/voice-collab/collaboration-tools/cloud-business-apps/>

¹⁸ <https://business.bt.com/why-choose-bt/insights/digital-transformation/artificial-intelligence/>

¹⁹ <https://business.bt.com/why-choose-bt/insights/internet-of-things/what-is-the-internet-of-things-for-small-and-medium-businesses/>

Rural residents can access government services, apply for permits, and receive important updates through online platforms, reducing administrative burdens and improving public service efficiency.

Precision Agriculture: Deploying IoT devices, sensors to monitor soil conditions, crop health, and weather patterns, optimizing farming practices and increasing yield.

Drone-Assisted Farming: Utilizing drones for crop surveillance, pest management, and precision spraying, enhancing efficiency and sustainability.

Blockchain-enabled Supply Chains: Establishing transparent and traceable supply chains, boosting consumer confidence in local produce by utilising data analytics to enhance supply chain efficiency, reducing waste and ensuring the timely delivery of produce.

Livestock Management: Implement IoT-enabled tracking and health monitoring for livestock, improving animal welfare and farm productivity.

Telemedicine and Remote Healthcare: Rural residents can benefit from 5G-enabled telemedicine services, allowing remote consultations with healthcare professionals, remote monitoring of chronic conditions, and timely access to medical expertise, reducing the need for long travel distances to medical facilities.

Education and E-Learning: 5G enables immersive e-learning experiences for rural students, providing access to online classes, virtual field trips, and interactive educational content. This reduces educational disparities and allows students to explore diverse subjects.

Agri-Tourism and Rural Economy Boost: Rural areas can promote agri-tourism by offering immersive experiences like virtual farm tours, rural cultural experiences, and guided hikes with 5G-enabled AR and VR technologies, attracting visitors and boosting the local economy.

Emergency Services and Disaster Management: In rural areas prone to natural disasters, 5G can improve communication between first responders, facilitate real-time data sharing, and enhance coordination during emergency situations.

Environmental Monitoring and Conservation: 5G-connected sensors can monitor wildlife, air quality, and natural resources in rural areas, aiding in conservation efforts and informed decision-making for sustainable land use.

Smart Infrastructure Monitoring: Remote monitoring of infrastructure such as bridges, roads, and power lines using sensors can detect structural issues in real time, ensuring timely maintenance and safety.

3.2.1 BT credentials

Addressing the digital divide, BT is actively extending 5G coverage to rural and underserved areas. Our ongoing efforts involve utilizing innovative technologies to provide high-speed internet access to remote communities. We invest £3.7bn in our network every year so we can expand, improve our coverage and connect more people. Our fixed network is trusted by thousands of businesses across the UK, including the ambulance service, fire, police and Ministry of Defence, and is the only one that offers 99.999% availability. Combined with our extensive 5G mobile network, powered by EE, we're enabling a new era of converged connectivity for the UK.

In rural areas, 5G connectivity can be a transformative force, enabling innovative solutions that improve residents' quality of life, promote economic development, and empower communities to thrive in the digital age..

- **[Precision Agriculture and Agri-Tech: IoT-Enabled Farming Solutions](#)²⁰**: BT is collaborating with agricultural experts and stakeholders to implement IoT-based solutions in precision agriculture. Our initiatives include deploying sensor networks to monitor soil conditions, weather patterns, and crop health. By providing farmers with real-time data insights, we empower them to make informed decisions and optimize crop yield.
- **[Agriculture- Intelligent Growth Solutions](#)²¹**: BT's Intelligent Growth Solutions is bringing together decades of farming and engineering experience to create revolutionary controlled-environment growth products for economical and sustainable farming. Its solutions - a vertical farm-in-a-box and growth stations for low-rise installations - are helping farmers and other food producers create consistent, reliable and sustainable produce regardless of location. Through innovative technology, Intelligent Growth Solutions optimises weather variables and eliminates the need for pesticides, enabling the growth of healthier crops with longer shelf lives at locations convenient to their customers.
- **[Remote Ambulance](#)²²**: BT showcase first 5G virtual and augmented reality together with robotic technology in healthcare to transfer services and deliver significant reduction in the number of patient trips to hospital and brought the concept of 5G connected ambulance to life.
- **[Drone-Assisted Farming](#)²³** : Drones are unmanned aerial vehicles: aircraft without any human pilots, crew or passengers. They're used for a range of purposes, from aerial photography to delivering life-saving supplies in remote areas. Our drone solutions are far-reaching and wide-ranging, including our counter drone technology, and Project Xcelerate, the future of drone technology.
- **Education and remote learning** already discussed in section 3.1.1.
- **Digital skills** already discussed in section 3.1.1.
- **Remote health care** already discussed in section 3.1.1.
- **Environmental monitoring towards Net zero targets** already discussed in section 3.1.1.

²⁰ <https://newsroom.bt.com/bt-collaborates-on-the-use-of-robotics-and-iot-to-transform-and-automate-agriculture/>

²¹ <https://newsroom.bt.com/a-connection-thats-changing-the-future--how-bt-is-supporting-vertical-farming-for-sustainable-agritech/>

²² <https://newsroom.bt.com/uhb-and-bt-demonstrate-uks-first-remote-diagnostic-procedure-using-a-5g-connected-ambulance/>

²³ <https://business.bt.com/corporate/products/enabling-your-places/protect/drone-solutions/>

3.3 Transport and Logistics

The deployment of 5G technology has brought transformative possibilities within the transport and logistics sector. For example, real-time tracking and monitoring of vehicles, assets, and shipments become significantly more accurate and efficient, enhancing supply chain visibility and reducing the risk of delays or losses. 5G-powered smart traffic management systems facilitate dynamic rerouting and congestion management, optimizing routes for fleet operations and minimizing carbon footprints. Maintenance activities are streamlined through remote diagnostics, reducing downtime and enhancing overall operational efficiency. In essence, 5G holds the potential to reshape the transport and logistics sector by fostering innovation, cost savings, and a more interconnected and responsive ecosystem.

Road management and Intelligent Traffic Management: Real-time monitoring of traffic flow, congestion, and road conditions, optimizing traffic signal timing for reduced congestion. Smart traffic management systems known as Intelligent Transport Systems (ITSs) integrate 5G networks and IoT technologies to efficiently manage traffic flow and enhance travel route effectiveness. By leveraging a suite of tools including IoT sensors, cameras, geofencing, automation, and advanced communication systems, together with 5G cellular technology, these systems dynamically regulate traffic control elements like traffic lights, freeway ramps, digital message boards etc...

Smart Parking Solutions: Utilizing sensors to guide drivers to available parking spaces, minimizing traffic congestion and emissions. This not only minimizes traffic congestion but also contributes to a reduction in emissions, driving more sustainable urban mobility.

Connected and Autonomous Vehicles: Enable vehicles to communicate with each other and with traffic infrastructure, reducing accidents and improving transportation efficiency. The establishment of inter- and intra-vehicle networks for Vehicle-to-Infrastructure (V2I), Vehicle-to-Vehicle (V2V), and Vehicle-to-Cloud (V2C) communication further enhances the efficiency of the transportation system. Key 5G features, such as network slicing, Edge Computing, and IoT sensors deployed throughout transportation infrastructure, enable a more responsive and efficient transportation system.

Asset monitoring and tracking: The capacity to ensure ongoing traceability of goods using IoT-enabled track-and-trace systems, network slicing, GPS, and XR technology is vital for efficiency. Ports and warehouses benefit from location data and real-time assessments, enhancing quality control, safety, and coordination.

Remote operations: 5G-enabled remote operations, capitalize on private 5G's improved network speeds, reduced latency, and reliability, to link and operate essential systems and machinery. Crucial 5G attributes like network slicing, Edge Computing, and IoT sensors installed at control centres within ports, warehouses, and depots enable a greater level of remote management capabilities for deployed systems.

Real time surveillance: Real-time remote visual monitoring and detection systems stand as a pivotal application of 5G in the transportation sector. Utilizing private 5G networks, IoT sensors, and high-resolution cameras seamlessly integrated into transportation components, the decision-making processes at Operations Control Centers (OCCs) are enhanced in terms of

speed and precision. This is important for scenarios involving autonomous and remote operations as well as scenarios on public safety of transport systems.

Autonomous vehicles in logistics: Autonomous vehicles in logistics refer to a wide variety of next-generation transport vehicles, including unmanned trucks, buses, forklifts, and AGVs. that leverage 5G network latency and throughput for adaptive operations. These vehicles capitalize on the 5G network's latency and throughput, enabling them to perform adaptive operations. With the integration of advanced sensors, Machine Vision (MV), Artificial Intelligence (AI), and real-time data, these vehicles achieve a remarkable level of autonomy, facilitating tasks like item collection, transportation, and delivery.

Autonomous transportation: Harnessing cutting-edge IoT sensors, Machine Vision, Artificial Intelligence, Machine Learning, and real-time data, the next wave of transport systems, comprising Unmanned Ground Vehicles (UGVs) like cars, trucks, and trains, as well as Unmanned Aerial Vehicles (UAVs) such as drones and airships, can orchestrate a spectrum of tasks for seamless navigation and operation within bustling urban and serene rural landscapes, all with minimal human interference. Trials and deployments include areas like smart trains and autonomous food delivery, taxis, and last-mile delivery services.

3.3.1 BT credentials

We collaborate, closely with customers, academia, and local governments, to implement a range of practical use cases within the Transportation & Logistics sector. Simultaneously, we drive forward research initiatives aimed at pushing the boundaries of potential applications. Below are some illustrative examples of our activities.

- **BT Surveillance for transport²⁴:** BT is offering a range of solutions to keep passengers and staff safe and infrastructure secure. We worked with Transport for Greater Manchester (TfGM) and re-deployed Minicam on traffic lights initially but later at traffic hotspots around Greater Manchester. a portable camera. TfGM has over 40 mobile surveillance Minicams helping them manage and improve safety of transport systems in an around Greater Manchester.
- **Connected and Autonomous Busses²⁵:** BT is a project partner for the [Northern Ireland self driving shuttle²⁶](#) Harlander project to establish Northern Ireland's first operationally ready, scalable, and commercially viable deployment of a fully automated shuttle service on mixed-use public roads. The service will utilise a ground-breaking, multi-purpose automated vehicle that enables a cost-effective scaling of passenger services and the introduction of a goods delivery service.
- **Autonomous Transport use cases²⁷:** BT was a partner of CURBS project working with Vortex IoT and National Express were LiDAR cameras were retrofit to vehicles in order to

²⁴ <https://business.bt.com/corporate/products/enabling-your-places/protect/surveillance/transport/>

²⁵ <https://www.sunderlandoursmartcity.com/uk-government-backing-helps-self-driving-lorries-and-shuttles-rollout-in-sunderland/>

²⁶ <https://www.belfast-harbour.co.uk/news/self-driving-shuttle-belfast-harbour/>

²⁷ <https://www.wm5g.org.uk/news/transport-competition-winner-curbs/>

more effectively manage the city's roads and infrastructure by utilising data to create a real-time 3D mapping and dynamic monitoring system using 5G and Artificial Intelligence.

- BT is offering a range of solutions for [Remote operations²⁸](#), [Asset tracking²⁹](#) and [Logistics³⁰](#) using IoT, wireless technology, sensors and data analytics solutions.
- [Smart parking³¹](#): As part of a pilot at Milton Keynes railway station, BT worked with specialist technology provider Deteq to install sensors in each shortterm parking bay. The sensors detect when a vehicle arrives and leaves, then send the information wirelessly to solar powered receiving units mounted to lampposts. These aggregate the data and send it to the MK Data Hub, hosted by BT. The data is analysed processed and the results are made available on the Milton Keynes Council public information dashboard, as well as via a browser that displays red (occupied) or green (free) bays on top of imagery from Google maps.
- [Connected and Autonomous vehicles³²](#): BT in collaboration with University of Warwick and Warwickshire County Council brought together the first demonstration of driveless cars over 5G network.
- [Drone-Assisted Services: Innovative Aerial Solutions³³](#): BT is actively exploring the integration of drones into various sectors. In collaboration with public safety agencies, we are piloting drone-assisted emergency response systems that leverage 5G connectivity to provide live video feeds and situational awareness during critical incidents. This technology enhances public safety and disaster management capabilities.
- [Data analytics used for rail and roads³⁴](#): Network Rail have awarded the 3-year Rail Demand contract to BT. Our insights on crowd movements drawn from our mobile network data will help Network Rail to understand passenger demand and usage across the entirety of the UK rail network to help them to achieve their purpose to get people and goods where they need to be, and to support Great Britain's economic prosperity. Our data are also used by other transport authorities to monitor traffic and manage road infrastructure operations.
- [Private Networks- Belfast Harbour³⁵](#): BT and Belfast Harbour announced a landmark partnership to build a state-of-the-art 5G ecosystem within the Port. The

²⁸ <https://www.iot.bt.com/insights/how-to-make-iot-work-for-your-business.html>

²⁹ <https://www.iot.bt.com/insights/asset-tracking-with-iot.html>

³⁰ <https://business.bt.com/content/dam/bt-business/pdfs/corporate/verticals/bt-rmg-main-report.pdf>

³¹ <https://www.iot.bt.com/assets/documents/bt-milton-keynes-innovative-parking-case-study.pdf>

³² <https://business.bt.com/why-choose-bt/insights/5g/warwick-university-connected-campus/>

³³ <https://business.bt.com/corporate/products/enabling-your-places/protect/drone-solutions/>

³⁴ <https://www.telcofitans.com/btwatch/network-rail-turns-to-mobile-network-data-in-bid-to-reduce-crowding/5932.article#:~:text=Network%20Rail%20turns%20to%20mobile%20network%20data%20in%20bid%20to%20reduce%20crowding,-By%20Richard%20Agnew&text=UK%20rail%20infra%20operator%20contracts,around%20network%20analytics%2Dbased%20solutions.>

³⁵ <https://www.belfast-harbour.co.uk/news/bt-and-belfast-harbour-partner-to-build-the-uk-and-ireland-s-fir-269/>

partnership will deliver a series of 5G-led innovations to accelerate Belfast Harbour's digital transformation and help deliver its smart port strategic ambitions. In a UK and Ireland-first, BT will build and manage a live 5G Private Network designed specifically to achieve the highest levels of ultrafast mobile connectivity, coverage, reliability and security across the port's main operational areas. The highly secure and scalable network will enhance safety, security and sustainability across the Harbour Estate and is expected to go live across large parts of the 2,000-acre site early next year.

- **Private Networks-Port of Tyne³⁶**: The Port of Tyne is advancing its ambition to become a world-class 'smart port' after partnering with BT to install a new 5G Private Network and other cutting-edge surveillance and smart technology. The arrival of 5G means the Port and its customers can take full advantage of advanced technology, including robotics and autonomous vehicles, artificial intelligence (AI) and Internet of Things (IoT) applications.

3.4 Advanced Manufacturing

In the landscape of advanced manufacturing, the integration of 5G technologies has ignited a paradigm shift that goes beyond the traditional production methodologies. By enabling seamless connectivity, real-time data exchange, and enhanced communication between machines, systems, and stakeholders, 5G paves the way for a new era of agile, efficient, and responsive manufacturing processes. Some of the use cases in advanced manufacturing discussed below.

Smart Factory Operations: Creating private 5G networks within manufacturing facilities for real-time monitoring, predictive maintenance, and quality control.

Drone-Assisted Inventory Management: Employing drones for inventory tracking and autonomous material movement, streamlining operations and reducing manual labour.

Industrial IoT Integration: Partnering with manufacturing facilities to establish private 5G networks, enabling remote equipment management, predictive maintenance, and process optimization.

Enhanced Manufacturing Efficiency: Real-time monitoring and predictive maintenance leading to reduced downtime, increased production efficiency, and cost savings.

Quality Control: Deploy computer vision systems that inspect and analyse products for defects, ensuring consistent quality and reducing waste.

Remote Maintenance: Enable real-time monitoring and remote maintenance of machinery, minimizing downtime and increasing overall efficiency

³⁶ <https://www.portoftyne.co.uk/news-and-media/news/port-of-tyne-to-invest-in-5g-private-network-and-other-new-tech-to-boost-smart-port-ambitions>

3.4.1 BT credentials

BT is leading a technological shift in the industrial sector by introducing private 5G networks within manufacturing facilities. These networks empower real-time production monitoring, predictive maintenance, and overall operational efficiency. From expediting manufacturing processes with 5G to scaling Industry 4.0 solutions, BT is driving innovation.

- [Private Network Deployment Industrial IoT Networks](#)³⁷ BT is working with manufacturing enterprises to establish private 5G networks within factory premises. These networks enable real-time monitoring of production processes, predictive maintenance of machinery, and improved overall operational efficiency. By leveraging private networks, manufacturers can streamline their operations and enhance productivity.
- [Virtual 3D is used by Hyperbat](#)³⁸: Hyperbat, one of the UK's largest independent vehicle battery manufacturers based at Unipart Manufacturing in Coventry, is using the latest 5G enabled technology to significantly speed up the manufacturing process for hybrid and electric vehicle production in the UK. Partnering with BT, Ericsson and NVIDIA, Hyperbat is set to benefit from a world first 5G Virtual Reality (VR) 'digital twin' solution which allows remote teams in different parts of the country to connect, collaborate and interact using a virtual 3D engineering model. By enabling dispersed teams across design, engineering and manufacturing to collaborate more efficiently, the technology is set to accelerate the pace of innovation within the UK manufacturing sector.
- [Manufacturing and industry 4.0](#)³⁹: Industry 4.0 - the automation of manufacturing using smart technology - brings many business benefits however, many struggle to see a quick enough return on investment and quite often those solutions are unable to get beyond a pilot. BT is helping customers to identify barriers to scaling and reap the benefits of Industry 4.0 by offering a range of solutions. In addition to a range of connectivity solutions offered to meet specific requirements and demand we provide Operational technology Threat Management service that will give visibility and control of the Operational Technology assets and enable to detect and remediate cyber threats by monitoring industrial equipment, assets, processes and events.
- [Digital vision](#)⁴⁰: In tandem with BT's 5G network solutions, Digital Vision gives access to more features such as high-resolution cameras and highly advanced analytics. Operating on a Software as a Service (SaaS) model, Digital Vision can be accessed on-premise, through cloud platforms, or as a hybrid setup. This versatile solution unlocks a multitude of applications across various industries, including manufacturing. It can facilitate tasks like automation, visual defect inspection along production lines, and security monitoring of manufacturing floor activities.

³⁷ <https://www.globalservices.bt.com/en/solutions/products/5g-private-networks>

³⁸ <https://newsroom.bt.com/hyperbat-accelerates-industry-40-with-world-first-5g-virtual-3d-engineering-model/>

³⁹ <https://www.globalservices.bt.com/en/digital-industries/manufacturing>

⁴⁰ <https://business.bt.com/corporate/products/enabling-your-business/5g/digital-vision/>

- **[Automation in manufacturing](#)**⁴¹: WM5G, nexGworx, BT, and Nokia have collaborated to establish a standalone 5G private network at Coventry's MTC through the Government's 5G Testbeds and Trials program. This initiative enables SMEs, corporate members, universities, and industries to explore private 5G and on-site multi-edge computing for innovation even after the program ends. The MTC has launched a 5G-enabled system for trials, featuring 5G-connected robotics, computer vision, and edge computing, using Nokia's Digital Automation Cloud. The trial demonstrated automated inspections using high-definition cameras and mobile robots via BT's private 5G network, enhancing productivity, quality assurance, and adaptability in manufacturing.

3.5 Creative Industries

The utilization of 5G in the creative industry focuses on elevating user experiences. Its implementation is in cloud computing, particularly for real-time Ultra High Definition (UHD) video streaming, and immersive Extended Reality (XR) engagements. Some of the use cases in this sector listed below.

Immersive Experiences: Facilitating virtual reality (VR) and augmented reality (AR) applications for interactive art installations and engaging experiences like museums, shows, festivals.

Remote Collaboration: Enabling seamless collaboration among creative professionals through high-speed, low-latency connections, fostering innovation and productivity.

Drone-Captured Cinematography: Incorporating drones for aerial shots and dynamic filming angles, enhancing storytelling in the film and entertainment industry.

Interactive Media: Implement high-speed 5G connectivity for real-time streaming and interactive media experiences, transforming entertainment and tourism offerings.

Digital Art Showcase: Establish a digital platform for local artists to showcase their work to a global audience, fostering creativity and cultural exchange.

3.5.1 BT credentials

In addition to Drones mentioned earlier we have been showcasing immersive experience using our networks at several occasions some of them shown below.

- **Broadcasting:** [BT's convergence of 5G technology and creative broadcasting provide sports fans with an engaging and immersive experience](#)⁴². As the transition to all-IP, cloud-based workflows continues, 5G emerges as a pivotal topic in media discussions. BT conducted two successful trials. The first trial took place during a rugby match, showcasing the benefits of 5G integrated with cloud-based technologies for broadcasters. The trial emphasized untethered, low-latency camera integration, enabling dynamic coverage and production. The second trial was implemented during

⁴¹ <https://www.the-mtc.org/news/mtc-trials-private-5g-network-for-manufacturers/>

⁴² <https://www.mediaandbroadcast.bt.com/insights/a-step-closer-5g-opens-up-new-opportunities-for-live-production.html>

the [Commonwealth Games](#)⁴³ coverage, demonstrating the use of synchronized wireless cameras in congested areas.

- [Green planet](#)⁴⁴: BBC Studios, 5G mobile network operator EE/BT, Royal Botanic Gardens, Kew, Talesmith and Dimension Studios worked together to deliver an immersive experience for The Green Planet 5G AR Consortium, led by the immersive content studio Factory 42. The trial offered to the visitors an immersive experience of the perspective of plants and discovered more about the interconnectivity of all life on Earth through high resolution holographic video delivered over EE/BT's network.

⁴³ <https://www.bbc.co.uk/rd/blog/2022-08-non-public-5g-networks-broadcasting-production>

⁴⁴ <https://www.bbcstudios.com/news/bbc-studios-the-green-planet-inspires-5g-powered-augmented-reality-experience/>

4 BT Infrastructure, Technologies and Capabilities

The realization of 5G use cases depends on the seamless convergence of two essential pillars: **robust physical infrastructure** and **cutting-edge digital infrastructure**.

The physical infrastructure forms the tangible foundation and encompassing a wireless network, a fixed broadband network and transmission nodes, sensors and other physical connected devices strategically positioned to ensure comprehensive coverage and ultra-low latency. This backbone provides the necessary framework for data transmission.

The digital infrastructure breathes life into this architecture. It includes complex software-defined networks, virtualized edge computing, and network algorithms orchestrate the flow of data, enabling real-time communication, IoT connectivity, and mission-critical applications.

The table below shows a mapping of infrastructure required to enable the smart city use cases.

Verticals Infrastructure	Urban connectivity	Rural Connectivity	Transport & Logistics	Advanced Manufacturing	Creative Industries
5G network & small cells	X	X	X	X	X
IoT platforms and sensors	X	X	X	X	X
Cameras	X		X	X	X
Augmented Reality	X				X
Private Networks	X		X	X	
Edge Compute	X		X		X
Drones	X	X	X	X	X
Data analytics	X	X	X	X	X

BT's infrastructure strategy is designed to create a robust foundation for the deployment of 5G-enabled solutions while ensuring the highest levels of security, reliability, and innovation. Our approach encompasses a comprehensive suite of technologies, including IoT, sensors, edge

computing, and Open Networks architectures, bolstering the capabilities of 5G networks and enabling transformative use cases.

- **Networks:** We excel in providing top-tier wireless networks, encompassing 4G, 5G, and WiFi technologies. With an unbroken record of being recognized as the best mobile network by Rootmetrics for 10 consecutive years, our prowess in wireless connectivity is undeniable. Moreover, boasting the largest WiFi network across the UK further establishes our commitment to delivering seamless wireless experiences. Our 4G network already reaches 99% of the UK population and we now have over 50% population coverage with our new 5G network. We're also investing in advanced network capabilities and developing new use cases for our customers. Our next generation networks will underpin all future BT Group products and propositions.
- **Small Cell Networks** : Strategically we deploy small cell networks to enhance coverage and capacity, particularly in densely populated urban areas, enabling seamless connectivity for our Network and all four UK based mobile network operators (MNOs) via our BT Wholesale team. As well as using our own assets (such as phone kiosks and street hubs) to host the apparatus, we have also established numerous partnerships with local authorities that enables usage of street lighting and CCTV columns further cementing our position as the UK's primary small cells provider.
- **Private Cellular Network:** high speed dedicated wireless connectivity deployed by the same world class engineering team that underpins EE (the UK's best mobile network). BT utilises a multi-vendor strategy with focus on the end-to-end solution for business transformation that is enabled by a private cellular 4G and/or 5G network. At its heart it offers high cyber-security, reliability, and unparalleled wireless performance. Local authorities would benefit from this capability in areas where they need outdoor wireless connectivity for either their own core services or tenant services. It can also be used to stimulate innovation and research due to the advanced properties and is being widely deployed by leading companies to support other advanced technologies like augmented/virtual reality, robotic control, drone, digital twins etc.
- **Rural Connectivity** Bridge the digital divide by expanding 4G & 5G coverage to rural areas, fostering high-speed internet access and enabling economic growth.
- **IoT and Sensors:** Internet of Things solutions are transforming the way businesses operate by providing accurate data driven insight that enables greater visibility, better decision-making and automated workflows. BT has a full suite of SIMs available on the EE network perfect for IoT solutions including elements like IoT SIMs (data only tariffs), LP-WAN SIMs (low power wide area networks) and National Roaming (moving between cellular providers based on best coverage). We also have extensive Hyperscaler partnerships through which we offer a co-creation IoT Solution engagement. Everything needed for the end-to-end solution is sourced by BT, including the sensor, data connection, IoT data lake, and data visualisation layer as needed. API exposure and integration into third party software is also available if needed. Local authorities would benefit from this capability in areas where near real time data would empower better

decision making for your own operations or for public/partner visibility to provide enhanced ancillary services.

- **Edge Computing**: when data needs to be processed close to the source instead of being sent to a centralised cloud infrastructure, BT has a range of Edge compute capabilities to improve the performance (latency), bandwidth efficiency and privacy/security posture of your services. Starting with our AWS Wavelength zone we can enable local authorities and regional companies to spin up mobile based services on compute infrastructure that means traffic does not leave the trusted BT network and gets best in class network performance. We also offer a range of on-prem hardware options that are protected by a BT managed service to ensure deployment support and proactive maintenance. Local authorities would benefit from this capability when performance and data privacy are of paramount importance.
- **Open Networks**: We embrace Open networks architecture to enhance our network flexibility, interoperability, and innovation while reducing vendor dependence.
- **Drones**⁴⁵ Integrating drones into our infrastructure adds an exciting dimension to our capabilities. Drones equipped with high-resolution cameras and sensors can be deployed for various purposes, including surveillance, environmental monitoring, public safety, and delivery services. In the context of smart communities, drones can play a pivotal role in enhancing situational awareness during emergencies, providing real-time aerial views to support disaster response. In rural industries, drones can revolutionize precision agriculture by conducting aerial surveys, crop monitoring, and even targeted pesticide application, boosting efficiency and sustainability. Our drone network will ensure seamless communication between drones and control centres, facilitating remote piloting, data transmission, and real-time decision-making.
- **Cyber Security**: Security is paramount in our approach to infrastructure development. We recognize the critical importance of safeguarding data, applications, and the integrity of the network. BT employs state-of-the-art security measures, including robust encryption protocols, secure authentication mechanisms, and continuous monitoring to detect and respond to potential threats. Our private network solutions are designed with stringent security measures, ensuring that critical applications remain isolated and protected. Additionally, our commitment to the principles of secure-by-design and adherence to industry best practices ensure that 5G-enabled solutions are resilient to cyber threats, enhancing the overall trustworthiness of the ecosystem. As part of our commitment to security, BT actively engages in collaboration with relevant authorities and regulatory bodies to ensure compliance with security standards and contribute to the development of a safe, secure, and resilient telecommunications network across the UK.

⁴⁵ <https://newsroom.bt.com/bt-groups-incubation-hub-etc-backs-altitude-angel-to-make-the-uk-a-global-leader-for-commercial-automated-drone-operations/>

- **Data – We have the biggest and the best in the UK⁴⁶**: BT Active Intelligence team is using cutting edge data science combined with machine learning and the data generated from our 24 million mobile devices. It means we can analyse the location, movement and web and app behaviours of your target audience, resulting in insights into how they behave. Although data is useful, it's only the first piece of the puzzle. We blend data with innovative analytics technology, to give measurable insights to take action on. The security of personal data is very serious. BT Active Intelligence is uniquely placed to safely share and analyse billions of responsibly sourced, anonymised, and aggregated data points from mobile phone activity across our spectrum.
- **Research & Development⁴⁷**: BT has robust research and development (R&D) capabilities that span various technological domains. The company's R&D capabilities enable it to pioneer groundbreaking solutions that empower businesses, optimize networks, and deliver enhanced digital experiences to customers. Collaboration is an integral component of our research strategy. It means everyone involved in long-term research takes on less risk, allowing us to tackle bigger projects. It also gives us access to broader expertise, skills and resources, helping us build mutually beneficial external networks. Innovation Martlesham is an established cluster of over 150 high-tech ICT/digital companies located at Adastral Park, home to BT Labs. As home to a diverse range of companies, from large corporates to some of the most exciting, dynamic start-ups, Innovation Martlesham is a collaborative ecosystem for technology companies.
- **Public safety and connected communities⁴⁸**: We have a range of solutions to support surveillance solutions for smart communities to not only provide public safety but also improve quality of life cost effectively. The surveillance network can be used to enable different use cases eg: traffic management, flood predictions, air quality measurement, public safety, travel updates and even provide a free public Wi-Fi network. Our solutions include a range of cameras connected via our **network solutions⁴⁹**, control room installation and training and ongoing maintenance. We offer a range of network solutions to support secure camera solutions. In addition to our wireless network technologies we offer:
 - **Fixed P2P networks transmission services**, Our offering includes fixed point-to-point (P2P) network transmission services such as RS 1000 (fibre) and RS 1000D (digital), enabling a direct connection from your street CCTV camera to your control room. This facilitates swift and secure data transmission to drive surveillance efficiency.
 - **Flexible IP networks (BT IP Connect)** For flexible and scalable IP networks, BT IP Connect emerges as the solution of choice. This adaptable platform is designed to accommodate growth, offering cloud-based IP-network solutions with the added advantage of integrating BT's robust cyber-security measures, thus ensuring network integrity.

⁴⁶ <https://business.bt.com/corporate/products/enabling-your-business/data-analytics/>

⁴⁷ <https://www.bt.com/about/bt/research-and-development#tommy-flowers>

⁴⁸ <https://business.bt.com/corporate/products/enabling-your-places/protect/surveillance/smart-cities/>

⁴⁹ <https://business.bt.com/corporate/products/enabling-your-places/protect/surveillance/networks/>

- **Fixed safety camera networks:** In the domain of fixed safety camera networks, our Safety Camera Connect service emerges as a pivotal solution. It establishes a secure and high-speed connection between your cameras and control room, guaranteeing an unbreachable feed while simultaneously driving operational cost savings. This commitment to safety and efficiency underscores our dedication to providing comprehensive and cutting-edge networking solutions.
- **Camera wireless networks:** Our portfolio extends to an array of wireless solutions for security cameras, ranging from point-to-point configurations for single cameras to point-to-multipoint setups catering to camera hubs.

All of the above capabilities can support and bring clarity and precision to your decision-making, leading to success.

5 Deployment Approach and Proposed services

Our partnership with your local community will deliver a comprehensive suite of services aimed at seamlessly integrating 5G technology into your communities. At high level we are proposing the following approach and services that can be tailored based on your local demand.

5.1 Needs Assessment and Prioritization

The first phase of the project will include active engagement and collaboration with you to conduct an in-depth needs assessment, ensuring a clear understanding of unique challenges and aspirations. Together we will identify and prioritize sectors for 5G deployment based on the initial assessment's findings.

5.2 Customized Use Case Design and Development

Once the needs and sectors have been identified we will work with you and your stakeholders to co-create tailored 5G use cases aligned with each identified sector, leveraging cutting-edge technology to address specific challenges.

5.3 End-to-End Deployment and infrastructure rollout

Based on the use cases and locality we will identify infrastructure requirements and we will manage the deployment and seamless integration with existing networks and applications to support use cases and services.

5.4 Use Case Implementation

In collaboration with stakeholders, software and applications will be developed to enable each use case, integrating data analytics and real-time monitoring using the deployed infrastructure.

5.5 Thorough Testing and Optimization

We will work with your stakeholders to conduct rigorous testing procedures to ensure flawless performance of 5G-enabled use cases, fine-tuning network parameters for optimal outcomes, cyber security, and performance of 5G-enabled use cases.

5.6 Capacity Building and Training

At the end of the implementation phase we will provide training programs to empower local stakeholders with the knowledge and skills necessary to maximize the potential of 5G technology.

5.7 Scale-Up, Replication and adoption

The successful use cases will serve as models for replication in other areas, contributing to the growth of the 5G ecosystem. We can work together to ensure adoption and plan for future use cases.

6 Expected Outcomes

Our collaboration promises a multitude of outcomes that contribute significantly to the growth and prosperity of your communities such as:

Connectivity without boundaries and economic inclusivity: Collaborating with BT, you enable widespread of high-speed connectivity and empower urban and remote communities whilst enabling several use cases across vertical industries and enhancing public services and community experiences. Small and Medium-sized Enterprises (SMEs) in these regions will find new markets and opportunities, levelling the playing field for economic growth. Citizens will enjoy richer municipality services and local authorities will be able to offer open services that address citizens and city platform needs.

Tailored Local Services: Data insights will help you understand specific neighbourhood needs and preferences and tailor your services. Local SMEs will contribute by providing tailored services, such as efficient waste collection, neighbourhood security, and community engagement platforms.

Empowering Collaborative Ecosystems: In both rural and urban areas, local SMEs will thrive within collaborative ecosystems. Startups and local businesses will partner with municipal authorities and community organizations to develop solutions that directly benefit residents. This collaborative spirit will drive innovation, local economic growth, and community empowerment. A culture of innovation will thrive as businesses, startups, academia, and local governments collaborate within the smart city ecosystem. This collaboration will lead to new applications, services, and solutions that address urban challenges and create economic opportunities.

Sustainability Driving Economies: The integration of 5G and smart technologies will lead to more sustainable local economies. In rural areas, efficient agriculture will ensure food security and economic stability. In urban centres, data-driven insights will aid in public services, traffic management, energy management and infrastructure optimization.

Cultural Enrichment and Social Engagement: In both urban and rural settings, 5G-powered platforms will facilitate cultural exchanges, social interaction, and community engagement.

Enhancing Quality of Life Everywhere: Regardless of their location, individuals will have access to modern amenities, opportunities, and services that promote progress, well-being, and a sense of belonging.

7 How to engage

BT is uniquely positioned to be your strategic partner in driving the 5G revolution within your communities. Our proven expertise, extensive infrastructure, and commitment to innovation ensure that together, we can unlock unprecedented possibilities for economic growth, technological advancement, and improved quality of life. By embarking on this journey with BT, local authorities can confidently pave the way for a smarter, more connected, and prosperous future.

If you are interested to collaborate for the 5GIR call for proposals, please contact :

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(<https://business.bt.com/public-sector/organisations/local-government/>)

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