

**Northern
Ireland**

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Pioneering smart cities technology for a sustainable future

Smart city technology is transforming the urban landscape, ushering in an era where cities are no longer just bricks and mortar, but intelligent, interconnected ecosystems. Northern Ireland's smart city tech companies are helping build these cities of the future, developing and implementing cutting-edge smart city innovations and solutions for customers all over the globe.

These companies are the product of a sophisticated tech ecosystem, a long tradition of innovation and creativity, world-class digital infrastructure and highly educated, skilled and passionate people.

Northern Ireland's companies have expertise in areas such as **data analytics, cyber security, smart governance, smart mobility, smart infrastructure, smart buildings, energy and health**. They are developing a range of innovations in digital technologies such as **IoT, AI, 5G, sensors, electronics systems and geospatial** to deliver economic, social, and environmental benefits for citizens in the UK and around the world.

The region has carved out a niche as an incubator for smart city companies who are developing products and services that enable better city services and a higher quality of life for citizens internationally.

Northern Ireland's capital city, Belfast, has acted as a test bed for companies building and testing smart city solutions to major urban challenges, such as climate change, sustainable urban mobility, the future of the high street and healthy urban neighbourhoods.

That's why the G20 Global Smart Cities Alliance has selected Belfast, as a Pioneer City for smart technologies. Meanwhile, the UK's Connected Places Catapult has selected Belfast to collaborate with Sejong in South Korea to drive smart city research and innovation. Belfast Harbour also recently secured £5.5 million from UK government, through the UK's Centre for Connected and Autonomous Vehicles, for Project Harlander. This project, which will also involve BT and Belfast-based cyber security company ANGOKA, will establish Northern Ireland's first operationally ready, scalable, and commercially viable deployment of a fully automated shuttle service on mixed-use publicly accessible roads.

Did you know?



Expertise

Northern Ireland's businesses and academic researchers are developing new products and services in response to global challenges which include **health and aging populations, climate change and resource scarcity, digital transformation, rapid urbanisation and the development of 'smart cities', and globalisation.**



Cities of the future

Northern Ireland ranked highly as one of the Financial Times fDi Intelligence's Top 15 Digital Economies of the Future and Belfast recently ranked second in the UK, just below London, in the Financial Times fDi's Top 25 Tech Cities of the Future.

According to fDi Intelligence, Belfast is the No.2 Mid-Sized/ Small City in the World for Business Friendliness and was ranked #5 Mid-Sized European City of the Future.



Leaders in technology

In 2024 Belfast Region and Innovate UK announced a £37.6m investment in the UK Digital Twin Centre, a centre of excellence that will revolutionise how industries develop products, services and systems across the UK. Led by Digital Catapult, the Centre has been endorsed by UK industry, launching with co-investment from three major industry partners.

The Centre aims to accelerate industry's adoption of digital twins through providing access to cutting edge technologies, reducing the costs of producing a digital twin, developing skills and capability in the workforce.



Next gen digital & telecoms infrastructure

Telecommunications has become a key enabler for the development of smart cities and Northern Ireland's telecoms infrastructure has strongly positioned the region to attract investment, develop indigenous business and stimulate innovation and competitiveness in the development of smart city solutions.

Northern Ireland was the first region in Europe to achieve 100% broadband coverage and benefits from a high capacity, low-latency transatlantic cable connection. This provides direct connectivity between Northern Ireland and North America, as well as onward connectivity to Europe and beyond. This 100-gigabyte per second (Gbps) telecommunications link means Northern Ireland provides the shortest and fastest international connection from North America to Europe.

With over 400km of fibre networks, Northern Ireland benefits from quality connectivity throughout and has the highest level of access to full fibre service in the UK.

96% of premises in Northern Ireland can access full fibre service, compared to the UK average of 71% (at Oct 2024).

Belfast is one of the most connected cities in Europe. Belfast ranked second in UK cities for availability of 1 gigabit capable broadband and, thanks to its fibre foundations, was one of first cities in the UK to benefit from a city-wide roll out of 5G.

Although it already has state-of-the-art fibre connectivity, Belfast recognises the strategic importance of next generation wireless connectivity. Partners plan to invest £30 million in advanced wireless networking to support research, business innovation and the creation of new city services.



Education and research

Northern Ireland has an extremely well-educated population. The region is home to two world-class universities, Queen's University Belfast and Ulster University. Both universities offer renowned degrees in computer science and software engineering which contribute to a strong talent pipeline for the technology sectors, including companies working on products for smart cities. There are 66,000 students in Northern Ireland Higher Education institutions, including 17,000 international students from over 100 countries, with 82% of graduates achieving either a first class or upper second-class honours degree. Belfast is ranked number 60 in the world's top cities for students (Source: QS Best Student Cities 2024).

Queen's University Belfast and Ulster University are leaders in research excellence.

Queen's University

Queen's University Belfast is over 175 years old, it is a member of the Russell Group of 24 leading UK research-intensive universities and ranked in the top 161 in the world for graduate prospects (Source: QS Graduate Employability Rankings 2022).

The Queen's University Institute of Electronics, Communication & Information Technology (ECIT) is a global leader in the advancement of cyber security, data analytics and wireless technologies.

Security for smart cities

The Centre for Secure Information Technologies (CSIT) at Queen's University Belfast is a global flagship centre for cyber security and is recognised by the UK's National Cyber Security Centre as an Academic Centre of Excellence in Cyber Security Research and Education. Encouraging collaboration to accelerate the results of cyber and physical security research through to commercial application, CSIT conducts research focused on market informed grand challenge areas that are directly related to smart cities. These include: secure connected devices, networked security systems, industrial control systems (ICS), security and security intelligence.

The Centre for Wireless Innovation (CWI) at Queen's University Belfast is the UK's largest research, development, and exploitation base in physical layer wireless, and one of the strongest in Europe.

Since CWI's inception, its mission has been to develop truly disruptive, end-to-end wireless technologies and techniques that will assist in the creation of a data-driven, hyper-connected society. Some of the research areas that directly relate to smart cities include future cellular systems (5G & beyond, 6G) and connected and autonomous systems (IoT, body area networks).



Ulster University

Ulster University is Northern Ireland's largest university, with over 27,000 students and its new Belfast campus is one of the largest higher education capital builds in Europe.

Ulster University's Cognitive Analytics Research Lab (CARL) focuses on the application of cognitive research in areas including health, fintech, advanced manufacturing, media and energy.

The Computer Science Research Institute (CSRI) conducts internationally excellent and world-leading research in intelligent systems, assistive technologies, next generation networks, and semantic analytics.

Research in the field of Smart Environments has become one of the key themes within the CSRI where activities focus on the problems associated with ageing, long term chronic conditions and the promotion of healthy lifestyles.

To support this work the Smart Environments Research Group (SERG) has created a suite of smart environments, which support the group's research within the domain of Smart Communities and Smart Cities.

AI driven infrastructure

The establishment of the £29m BT Ireland Innovation Centre (BTIIC), a partnership with BT and Ulster University, demonstrates the university's strengths in application-oriented AI and data analytics. There is a focus on advanced R&D in core technology areas related to future telecommunication networks and services, including data analytics, internet of things (IoT), cyber security, fixed and mobile network services and new products and services development.

Further education

Northern Ireland's six Further Education colleges operate across over 40 campuses and work closely with the tech sector to develop and deliver a range of professional and technical programmes, including apprenticeships, degrees and Assured Skills Academies, to more than 50,000 students.

Northern Ireland's smart city innovators

Northern Ireland is internationally recognised as a leader in smart cities technology because of its creativity and the expertise of its skilled workforce combined with its telecoms infrastructure. These factors have allowed companies in the region such as See.Sense, Analytics Engines, Kainos, Kinsetu, BT, Anaeko and ANGOKA to develop smart city solutions for intelligent asset tracking, pedestrian and crowd analytics, remote building and machine monitoring. They are using IoT and data to improve and connect networks, services and the urban environment for the benefit of citizens and society as a whole.

3DEO

3DEO has developed an innovative, cloud hosted product, *ActiveMaps.Live*. The platform facilitates efficient real time monitoring, decision-making, remote working and collaboration, in key market segments including commercial infrastructure, environmental monitoring and city/region management.

3DEO makes sense of diverse and combined data from repositories, sensors and IoT in geospatial context.

www.3deo.com

Anaeko

Anaeko is a trusted data partner of large public and private sector organisations. The company provides the following services: Agile & DevOps, data optimisation, integrated analytics and hybrid cloud Integration. It has a focus on transport and logistics, the health sector and smart cities including a number of smart water analytics solutions.

www.anaeko.com

Analytics Engines

Analytics Engines provides data analytics solutions to the public and private sector by reducing complexity, optimising performance and maximising the value of data.

www.analyticsengines.com

ANGOKA

ANGOKA protects communications for smart cities and mobility. The company's hardware-based solutions safeguard critical machine-to-machine communication integrity and data provenance, creating trusted connections, even in untrustworthy networks. ANGOKA's solutions are used in automotive, aerospace and defence, advanced manufacturing, IoT and telecoms.

ANGOKA's solutions are for smart cities and mobility, heightening the cyber security and safety of devices, vehicles and networks. The future viability of smart cities and mobility is in fact dependent on the cyber security measures that will be implemented to protect citizens and infrastructure against potentially dangerous cyber attacks. Angoka's technology is directly applicable across smart cities, its solution in essence enables the sustainability goals that are associated with smart technology, such as decreased carbon output and improved transport.

www.angoka.io

Artemis Technologies

Artemis Technologies develops a range of high-speed 100% electric vessels powered by the transformative Artemis eFoiler® system. Artemis Technologies have launched the world's first commercially viable 100% electric foiling workboat.

The company's Artemis EF-24 Passenger, a high-speed passenger ferry, and the Artemis EF-12 Escape, a luxury water taxi, have been designed as immediate green transport solutions and enable smart mobility.

www.artemistechnologies.co.uk



Artemis Technologies, Belfast Harbour

BT

BT is a leader in smart city solutions, using its network, cloud, data, and security expertise to enhance the lives of local people and the environment. BT works with city organisations, partners, and stakeholders to co-create tailored solutions for smart city applications, such as intelligent transport, smart lighting, environmental monitoring, sustainability, public safety and the experience of local people. BT's leading IoT network enables it to be involved in new industries and explore unimagined opportunities, such as the autonomous vehicle project with Belfast Harbour, which showcases BT's innovation in 5G, IoT, and cyber security, and its vision for next generation technologies for smart cities.

www.bt.com/about

Camlin

Camlin provide a range of innovative and intelligent monitoring solutions focused on optimising critical infrastructure (energy and rail networks). Camlin's Energy business division (trading in the UK and Ireland as Kelvatek), provide a range of services to the UK Distribution Network Operators. An end-to-end solutions provider, their innovative monitoring and management solutions help energy operators secure better customer outcomes and realise greater returns from their network infrastructures. Ultimately, their solutions have helped a range of organisations mitigate costly transformer failures and ensure asset availability.

www.camlingroup.com

CreevX

Creevx is an industrial IOT enterprise. Bringing together AI, automation, data and modular cloud platforms with facilities management expertise, Creevx's solution allows users to better understand the health of their building's water network.

The company's innovative smart, remote water management solution remotely monitors water temperatures and can automatically flush non-compliant water. In doing so, Creevx is helping clients, like CBRE, Dublin Airport, The Welsh Parliament and NI Water to improve their regulatory compliance, improve water conservation, reduce energy costs by not wasting hot water unnecessarily, as well as lower carbon emissions and enable large savings in operational budgets.

www.creevx.com

Joulen

Joulen partner with their clients to seamlessly implement their AI platform to optimise renewable asset performance. The company's PARIS platform is the gateway to energy flexibility. Analysing, Optimising and Maximising your solution across multiple revenue opportunities while driving down grid costs to boost return on investment.

www.joulen.com

Kainos

Kainos has proven expertise in delivering real-world IoT solutions that integrate edge device data with business applications for deeper insights that drive new operational benefits. The company's data engineering and machine learning experts bring end-to-end IoT solutions to life within robust, scalable, secure and intelligent cloud data platforms incorporating device provisioning and management for smart cities, smart hospitals and smart factories.

www.kainos.com

Kinsetsu

Leveraging cutting-edge IoT technologies, Kinsetsu empowers cities to become more efficient, sustainable, and interconnected. Through its advanced solutions, it facilitates real-time data collection, analysis and automation, paving the way for intelligent urban infrastructure. Blending software and sensors allows Kinsetsu to play a pivotal role in transforming cities into smarter, more responsive environments, enhancing the quality of life for residents while promoting environmental sustainability.

www.kinsetsu.co.uk



LoweConex

LoweConex is leading the development and distribution of a new generation of award-winning IoT systems that enable retailers to connect, optimise and remotely control their instore asset portfolio in real-time. The only OmniTech brand that creates profitability from assets via scalable control, its innovative technology promotes sustainable business via energy reduction, carbon emission savings, streamlined maintenance and more.

www.loweconex.com

Nulok Roofing System

Nulok is an innovative solar tile technology combining stunning aesthetics, ease of installation, and sustainable materials. The Nulok Roofing System offers high energy efficiency, durability, and a sleek design, ideal for eco-friendly construction. Nulok's tiles support modern construction methods and cradle-to-cradle efficiency.

www.nulokroofing.com

Salt Communications

Salt is a secure communications system that provides the best armour to organisations to help protect their trade secrets and other sensitive, strategic and proprietary information when communicating on mobile and desktop devices. This offers peace of mind to organisations that value fundamental privacy by enabling complete operational control and secure end-to-end communications, protecting their trusted relationships and vital interests. The Salt system is built with the features and technology to keep communications private and compliant.

www.saltcommunications.com

See.Sense

See.Sense utilises patented AI sensor technology to make micro-mobility better. The company's award-winning bike lights and GPS trackers generate granular sensor data on bikes and e-scooters, which provide a powerful insight into the rider's experience. By working with cities, fleet operators and employers, See.Sense is helping to transform cities for active travel.

www.seesense.cc

Skylark

Skylark is a digital operational control software platform that enables owners and operators of wind farms to track and manage workers more safely and effectively. Site-based personnel use their mobile app to complete inductions, check-on and off site and receive work orders, greatly reducing the administrative burden on operational control rooms.

www.skylarkcontrol.com

Stormharvester

Stormharvester is a leading smart drainage company which helps wastewater utility companies better manage their networks. It combines AI with hyperlocal rainfall forecasting and has developed a unique algorithm that provides operational and asset intelligence to wastewater utilities. This insight enables condition-based maintenance which helps to reduce flooding and pollution events.

www.stormharvester.com



SustainIQ

SustainIQ is the all-in-one sustainability and ESG reporting solution for businesses. Using a mobile app and web-based integrated reporting dashboard, users are empowered with real-time information and insight into their environmental, social and economic performance. SustainIQ allows users to streamline sustainability with one easy-to-use tool.

www.sustainiq.co.uk

TriEX Limited

TriEX is an award-winning infrastructure company specialising in the power and telecoms sector. The company plays a key role in building renewable and energy projects across the UK, Ireland, and Europe, collaborating with some of the world's largest and most trusted organisations to innovate the delivery of their infrastructure. TriEX continually seeks ways to innovate its offerings to support the development of tomorrow's infrastructure and operates in an industry that is vital for the future, with sustainability, renewables, and connectivity serving as key drivers for its business.

www.triexlimited.com

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For more information on Northern Ireland smart cities visit - www.investni.com/support-for-business/exhibitions-trade-missions/smart-city-expo-world-congress

Version 10/24

Wrightbus

The world's first hydrogen double deck bus, the StreetDeck Hydroliner has been created by Wrightbus. It is an economical, safe and environmentally friendly vehicle that will revolutionise the industry and usher the world into a new era of transportation.

The Hydroliner is equipped with a Hydrogen Fuel Cell power train and its battery pack can store up to 48KWh that allows the bus to travel up to 280 miles. It has been designed to meet the demands of both bus drivers and passengers.

www.wrightbus.com



Wrightbus, Ballymena