

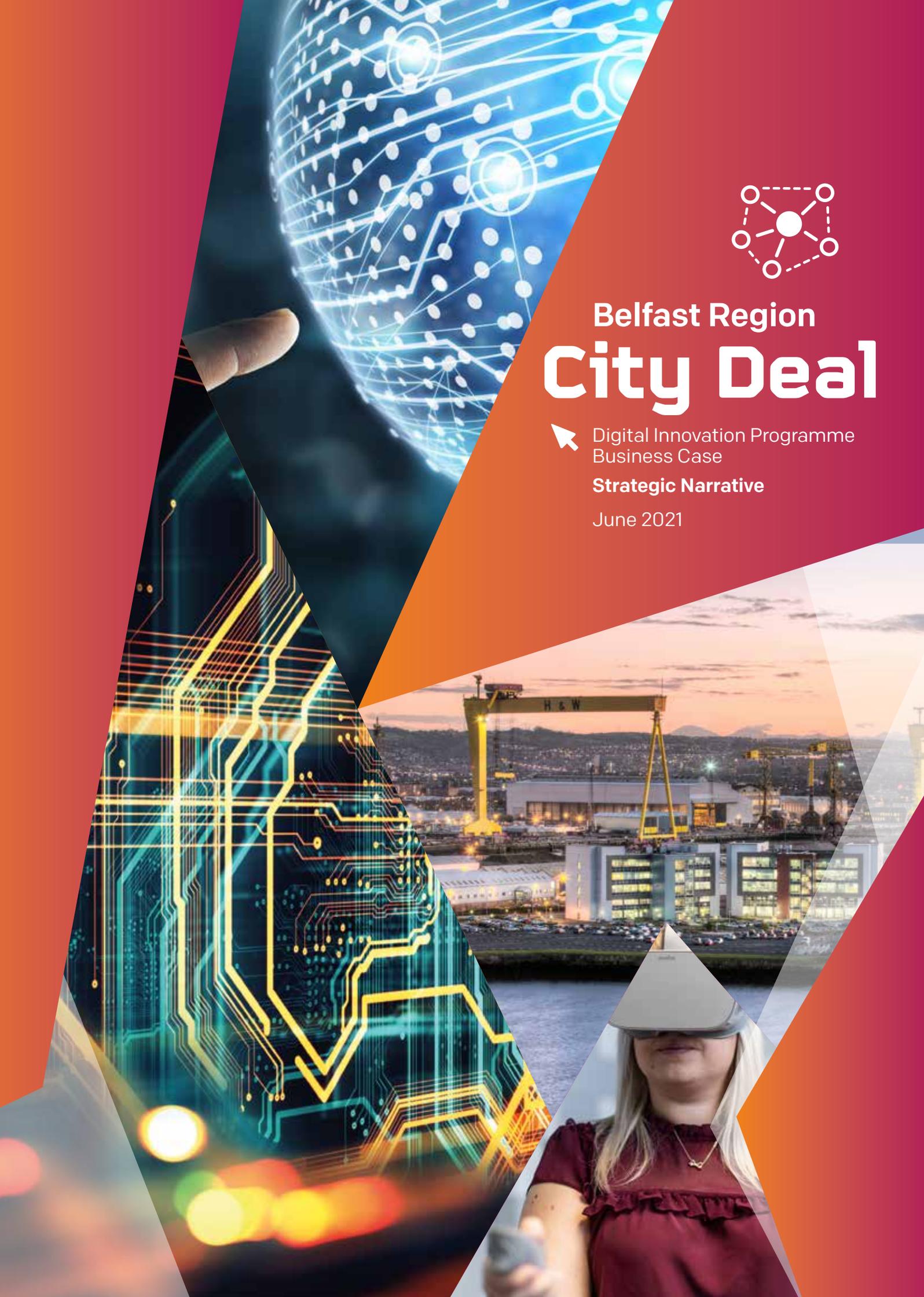


Belfast Region  
**City Deal**

➤ Digital Innovation Programme  
Business Case

**Strategic Narrative**

June 2021





# Introduction

Belfast Region City Deal partners have been working closely with industry, government and further and higher education to plan a series of major digital investments that, together with other City Deal investments, are designed to have a transformational impact on the region's economy.

This document briefly explains the rationale for these digital pillar investments, the challenges they are designed to address, the impact they will have and, at a programme level, the emerging projects and opportunities they are designed to unlock.

## Belfast Region City Deal

Since 2017 the **Belfast Region City Deal (BRCD)** partners have been working to secure **£1 billion of co-investment that aims to accelerate inclusive economic growth for the Belfast region and deliver thousands of new and better jobs, accessible to people from all communities.**

The UK and NI Governments have committed £700 million to BRCD, with a further £150 million committed by the BRCD partners and by leveraging private sector investment.

The BRCD programme seeks to build upon the strengths and unique characteristics of the

Belfast region, and tackle barriers that have traditionally constrained productivity and excluded many from enjoying the benefits of economic prosperity.

Directly aligned with the UK Industrial Strategy, draft NI Economic Strategy and the NI Executive's Programme for Government, the BRCD programme aims to deliver its ambitions for inclusive growth through four pillars of investment:



### Innovation and digital

Innovation and digital are closely integrated and mutually beneficial, and targeted investment will aim to transform the region's digital and innovation capabilities. As well as the digital innovation proposals outlined in this document, the investment will also deliver five world-class centres of excellence focusing on life and health sciences, advanced manufacturing, creative industries and big data.

### Boosting tourism and regenerating our region

Investment aims to create a regional, sustainable, year-round tourism product that will provide stand out in international markets through investment in diverse world-class visitor attractions. In addition to these tourism products, investment is being directed towards towns that have suffered from industrial decline and economic restructuring.

### Infrastructure

Investment in key transport infrastructure will connect people to opportunities across the region.

### Employability and skills

Targeted investment will ensure that the right skills are available within the region to support the growth created by the capital investments across the City Deal - and its specific importance to the digital pillar is outlined in this document.

# The case for digital investments

The overarching premise for the digital and innovation investments is a straightforward one. The Belfast Region has historically underperformed in terms of its productivity and its capacity to generate jobs in relation to the UK's average performance. This under performance is directly related to issues that to date have not been adequately addressed by existing policy interventions. Encouragingly, there is strong evidence to suggest that targeted investments that nurture digital innovation across the economy can have a transformational effect in addressing these systemic issues.

Without such proactive investments, the region's systemic weaknesses will continue to act as a drag on its economic performance, and ultimately have negative social consequences. The status quo does not offer a viable basis for going forward.

The good news is that the region has enviable strengths upon which to build an innovation economy. These include a deep history of research excellence in our universities, a grassroots tradition of hard work and entrepreneurship, a highly skilled workforce, investment in digital infrastructure and a flourishing knowledge economy sector that is punching well above its weight at national levels.

By building upon these strengths the region can better position itself to meet the challenges of the coming decade. Such challenges include the immediate COVID-19 crisis and its long tail implications which are likely to test the mettle of even the most resilient economies. However, we also face other momentous challenges - the need to rapidly decarbonise our economy over a very short timeframe; the need to address ever-widening levels of economic and regional inequalities; and the need to plan for the impact of a whole class of new technologies that are expected to disrupt many jobs and businesses; technologies such as AI, robotics, cloud and edge computing, 5G and the Internet of Things. How we prepare our workforce, our businesses and wider society for the consequences of these challenges is one of the most pressing issues facing public policy makers.

We believe that, properly prepared, the Belfast region is well-placed to seize the myriad of opportunities that these interwoven challenges represent. The City Deal offers a once-in-a-generation opportunity to make carefully tailored digital investments that can support the region in harnessing the many economic opportunities associated with these disruptions, while at the same time helping to mitigate any negative consequences.

# What are the drivers of need?

Some of the key drivers for investment in the region:



## Persistent levels of low productivity

Our region lags behind the UK average by about 18% (GVA per hour worked), and our employment rate is 7% lower than the UK average.<sup>1</sup>



## Addressing inequalities

Tackling persistent regional and local inequalities in terms of investment and outcomes and thus contributing to the national 'Levelling Up' ambition.



## Regional underinvestment in R&D

There is a strong correlation between R&D expenditure per capita and Gross Value Added (GVA) per capita. Northern Ireland is twelfth of 12 UK regions in terms of innovation investment. This is compounded by a disparity in UK government R&D funding in the region of £250 million per annum.<sup>2</sup>



## Lack of resilience to disruption by emerging technologies

Emerging technologies may have an impact on employment and businesses. 7% of jobs are at high risk from automation, with a further 58% at risk of substantial change. Conversely, with proper policies in place, up to 98,600 additional jobs could be created by 2030.<sup>3</sup>



## Low levels of automation and technology integration

Particularly amongst established SMEs in non-digital sectors, as well as wider societal and public service adoption.



## Harnessing digital's contribution to the COVID-19 recovery

A need to recognise and support the role of digital innovation in contributing to economic and social recovery.



## Better routes to commercialising R&D

The need to support further and higher education and industries to take world-class R&D through to market launch and commercialisation.



## Upskill based on our digital expertise

The need to develop a strong network across sectoral clusters in industry, to support those in education to transition to employment.

### Sources

1. Regional Accounts (GVA), Labour Force Survey (labour force and total employment), Annual Survey of Hours and Earnings (hours worked), Nomis (mid-year population and working age population estimates), UUEPC analysis.
2. The Innovation Dashboard, UK Regional Innovation Rating, DfE, 2014.
3. [www.nerininstitute.net/research/future-work-impact-automation-technologies-employmentnorthern-ireland](http://www.nerininstitute.net/research/future-work-impact-automation-technologies-employmentnorthern-ireland)

# Our digital innovation proposition

**City Deal partners have engaged with stakeholders to craft a proposition that builds on the region's unique opportunities and seeks to address the drivers outlined in the previous section.**

## The assumptions

There are several assumptions associated with the overall approach to the programme. We have tested these by looking at national and international policy and practice; by engaging with stakeholders at a regional level; and by looking closely at what is already working well in the region. Our assumptions:

- Innovation is a powerful catalyst for increased productivity and economic growth.
  - The outputs from successful collaborative innovation can be harnessed to directly address public policy challenges.
  - Inclusion needs to be built into an innovation-led approach to ensure that benefits accrue across society.
  - We are a small economy and there is merit in recognising those things that we are extremely good at and making them even better. The region has significant growth clusters with deep links to the research strengths of both local universities. These clusters offer a firm basis for us to build globally competitive offerings.
  - Innovation does not happen in isolation. It requires an enabling environment that is rich in talent, offers advanced digital connectivity, supports local businesses, offers open access to rich data, and facilitates collaboration across many sectors. We need to actively nurture and invest in this enabling environment.
- The successful adoption, integration and exploitation of digital innovation is dependent on a range of factors. These include:
    - A leadership cohort committed to a partnership model that fosters triple helix collaboration between industry, further and higher education and the public sector.
    - A focus on those clusters where the region has unique strengths and that can offer the potential to compete nationally and internationally.
    - The ability for any programme to flex and pivot in response to emerging opportunities and rapidly changing circumstances.
    - Support for a generation of creators and entrepreneurs to fulfil their ambition.
    - A recognition of the power of place and its role in attracting talent, investment and in offering a rich real-world environment for research and development, trials and testing. 'Place' acts as a powerful contributor to collaborative innovation through agglomeration and networking effects.
    - Timely, and agile investment from both the public and private sectors.



# Our approach

Systemic challenges require a collaborative approach, hence our emphasis on nurturing a new partnership model for leadership and delivery across industry, further and higher education and government, and wider society.

The public sector has a leadership role to play, with its unique value in building a common direction of travel for social outcomes, and its ability to make patient investments over very long timescales.



Our approach is to place decision-making and planning in the hands of those who best understand the nature of the local opportunity, and who can respond with agility and creativity within a supportive ecosystem of knowledge, resources and funding. This is particularly important in ensuring that growth is inclusive and that communities are supported in harnessing these opportunities.

Unsurprisingly, partners are placing great emphasis on the power of digital innovation to do much of the heavy lifting. Emerging technologies (including AI, 5G, IoT, quantum computing, robotics, etc.) will impact on all aspects of life and business. While we can't confidently predict what this disruption will look like, the partnership can draw on the region's existing research and knowledge economy successes to support SMEs and the workforce to prepare for it and to build resilience.

Investment in innovation will be targeted at the nexus where the deep research strengths of the

local universities align with those key industry sector clusters that are demonstrating the potential for exceptional growth. Places that fail to invest in innovation are less wealthy, less productive and less competitive. Businesses that innovate are more productive, with sales and employment growing twice as fast as their non-innovating competitors.

Our programme aims to play a key role in driving and supporting a Digital Innovation Ecosystem to 'deliver transformative, sustainable economic growth for all of our citizens by coalescing the core capabilities of our industry and academic research excellence to address our most significant global challenges'.



## What is a Mission orientated approach?

Belfast Region City Deal partners have adopted a mission-orientated approach to shaping the digital innovation programme.

The approach uses the digital innovation programme's three Grand Challenges to stimulate collaborative innovation across industry, further and higher education and government.

By establishing timebound missions that address aspects of each Grand Challenge, we aim to stimulate innovation in key areas while at the same time encouraging R&D investment and business growth.

The mission-oriented approach is based on the work of Mariana Mazzucato at the Institute of Innovation and Public Purpose. It has also influenced the UK's Industrial Strategy and the EU's new €94 billion 'Horizon Europe' programme.

City Deal partners will define an initial batch of Missions that will shape the criteria and purpose of the programme's funding instruments and emerging projects.

**Building on the drivers of need and assumptions, partners have developed the following approach to the digital innovation programme:**

1. Adopt a **mission-orientated approach** that supports both economic growth and innovative solutions to public policy grand challenges.
2. Support a **collaborative partnership model** that can drive co-investment and collaboration across industry, further and higher education and government.
3. Build on those **key industry clusters** in the Belfast region that demonstrate the potential for global excellence in innovation and research.
4. Create **investment instruments** that can respond with flexibility and agility to emerging opportunities and that support long-term digital, research and innovation investment.
5. Work better together to harness the potential of **existing funding mechanisms**, from Innovate UK and others, to better meet our regional ambition.
6. Support opportunities to maximise the translational research potential and societal impact of the five **new innovation centres of excellence** being developed by Queen's University and Ulster University.
7. Foster an **inclusive approach** by building strong links with the City Deal Employability and Skills pillar.
8. Invest in the necessary **enabling infrastructure** to nurture greater place-based investment in digital innovation and build excellence and capability across the Belfast Region.



## Innovation Centres of Excellence

A key focus for the digital programme will be to create the conditions to maximise the impact of the universities' new centres of innovation, to encourage translational research into the key industry growth clusters identified in the digital innovation programme.



### 1. Institute for Research Excellence in Advanced Clinical Healthcare (IREACH)

Unified capability for clinical research, bringing together academic, industry, NHS and government stakeholders to create a unique ecosystem for testing new drugs through their development life cycle and integration into care pathways.



### 2. Global Innovation Institute (GII)

An innovation centre in digital technologies, applying cyber security, wireless connectivity, artificial intelligence, machine learning and scalable computing approaches to address local, national and global challenges, with primary areas of focus in health sciences and agri-food.



### 3. Advanced Manufacturing Innovation Centre (AMIC)

Facilities in Antrim and Newtownabbey to accelerate new manufacturing technology development through the innovation phase and ensure that real-world industrial challenges, based on market need, are solved through cutting-edge research.



### 4. Centre for Digital Healthcare Technology (CDHT)

A world-class space for researchers, industry and clinicians to innovate in Life and Health Sciences solutions including connected health and telemedicine, and provide the building blocks for a MedTech innovation cluster.



### 5. Screen and Media Innovation Lab (SMIL)

Providing the physical infrastructure to support the rapidly expanding activity in the region's creative industries sector, encouraging new creatively-led, technologically-driven R&D in key areas.

# The investment instruments

Through engagement with stakeholders, partners identified three instruments that are required to implement their approach and deliver the required impact:



1. A **Challenge Fund programme** will focus on a range of Missions designed to address the regional Grand Challenges of Artificial Intelligence, Health and Wellbeing and Sustainability and Resilience providing competitive grant funding, equity/debt finance and investments targeting innovation for societal impact, including SBRI and Challenge Prizes.



2. **Enabling Infrastructure** will support the development of a Belfast Smart District and a regional testbed network through investment in world-class digital connectivity and data infrastructure.



3. A network of **Regional Innovation Hubs** will ensure diffusion of innovation and skills throughout the region, and further build on regional strengths in key sectors such as advanced manufacturing and creative industries.

The likely shape of each investment is outlined as follows. The final budgets and shape of each instrument will be agreed in the coming months.

## An agile governance partnership



Given the level of ambition and the range of stakeholders involved, robust yet agile governance will be a critical component of the digital innovation programme. The governance mechanisms are designed to foster and grow a unique triple-helix partnership model across the region. Commencing with a set of core components, the governance arrangement will grow in step to meet the increasing ambition of the programme.

### Some of the responsibilities will include:

- Developing and managing the region's Grand Challenges, strategy, outcomes and evaluation framework.
- Setting the investment strategy, priorities and Missions for each fund.
- Fostering a regional triple-helix partnership model.
- Responsibility for City Deal funding obligations including the management and the distribution of each fund.
- Provision of independent investment advice.
- Identifying projects for business case development.
- Supporting assembly of complex collaborative projects and external funding bids.



## The Belfast Region Innovation Challenge Fund



**This £55m fund will stimulate innovation within the sphere of the programme's three Grand Challenges: *Artificial Intelligence and Data, Health and Wellness and Sustainability and Resilience.***

The agile fund will respond to the emerging needs and unique characteristics of the region and be shaped by a series of 'Missions' to stimulate collaborative innovation and investment.

The mission-orientated approach aims to support growth in key industry sectors as well as address the major public policy challenges.

We have placed great emphasis on challenge funding because we recognise that we exist in a rapidly changing environment. And while the City Deal offers funding across a ten year time scale, many of the challenges, solutions, and in particularly, technologies, often change over periods of time measured in months, not years.

A challenge fund approach does not attempt to second-guess solutions. Instead it is a means to articulate our shared challenges whilst offering fast acting channels to support emerging solutions.

Our fund will have three main instruments:

- Equity/debt financing
- Competitive grant
- Innovation for Societal Impact (including SBRI-type investments and Challenge Prizes)



### Equity/debt financing



Designed to meet the gap in available equity finance in Northern Ireland at the Pre-Series A Venture Capital level, the partnership will seek to invest patient capital in a small number of deep tech start-ups that have significant global growth potential, demonstrating scalable market opportunities and early market traction.

It will also seek to support deep Intellectual Property (IP) that is linked to the three Grand Challenge areas.

The Equity Fund is expected to be Evergreen, seeking to plough returns back into the programme.

#### Key characteristics:

- Launching by 2022.
- £20-30 million fund.
- Initial investments in the £500,000 to £2 million range.
- Investing in approximately six companies.
- Estimated to achieve a Gross GVA of £171 million (before discounting).



## Competitive grant



Designed to address the disparity in public sector R&D spending in Northern Ireland (relative to other UK regions), this fund will provide research finance for the region's deep tech start-ups and innovative SMEs that have significant global growth potential. It will be sensitive to the specific characteristics of the region, and companies will have a range of support.

The fund will also seek to support deep intellectual property (IP) exploitation that is linked to the three Grand Challenge areas.

### Key characteristics:

- £15-20 million fund.
- Initial investments of approx. £500,000 to £2 million.
- Grant awards of circa 40% (and thus leveraging private sector funding).
- Investing in approximately 12 companies.
- Fund will be managed on the region's behalf by an independent body.



## Innovation for Societal Impact



This programme builds on the elements of the Small Business Research Initiative (SBRI) that are strong, but will address those parts of the approach that have traditionally been less successful. We will construct a variant that will encourage more collaborative innovation between the private, public and research sectors and place greater emphasis on both pre-development work and on the 'first customer'.

The programme will thus provide a supportive environment for SMEs to develop proofs of concepts through to real-world prototyping and commercialisation.

### Key characteristics:

- £15-20 million fund.
- Providing up to 100% funding of approx. £500,000 to £2 million.
- Supporting a collaborative model that may include public, private and academic recipients.
- Investing in approximately 12 companies.
- Delivery model will complement NI Government's existing SBRI programme.

## Enabling Infrastructure



The UK Digital Strategy notes that for **'businesses to thrive and grow, Government needs to create the conditions and set the framework for investment in widespread and up-to-date infrastructure.'** Investment in enabling infrastructure will stimulate the conditions for innovation and business growth.

By targeting investment in digital connectivity, data infrastructure and other enabling infrastructure, the partners can enhance programme interventions, for example, in supporting IoT applications, data platforms and other digital and physical hardware and equipment.

The fund will have a particular focus on supporting the rapid availability of advanced wireless networks, supporting the development of the Belfast Smart District and Regional Testbed Network and providing digital connectivity for wider City Deal projects, given technology's underpinning role in the future of many commercial and public services.

BRCDC partners will identify investment opportunities and develop individual business cases prior to the drawdown of any funding.

### Key characteristics:

- £39.5 million fund.
- Supporting large scale projects, developed through individual project business cases.
- A proportion of the fund will be competitive - providing grant funding to public sector partners.



## Regional Innovation Hubs



**A series of Regional Innovation hubs will build upon and leverage existing sectoral strengths in order to promote innovation activity and new business growth across the region via local hubs. Each hub will have a specific sectoral focus and purpose.**

Collectively, the hubs will provide a horizontal digitalisation support to expedite the widespread adoption of digital technologies by companies at different digital maturity levels and thereby mainstream digital innovation activities across the region. The Hubs will also:

- encourage greater investment in innovation activities, particularly supporting open innovation;
- support business cluster and innovation support across the region;
- create SME digital hubs across NI to support more companies engage in e-business and benefit from digitisation; and
- work with industry and educational institutions to develop a network of digital hubs across the region.

### Key characteristics:

- £25 million fund plus £5m investment from partner councils.
- Councils will develop individual business cases for each hub.

# The impact

**In the design of the programme and its instruments, partners wish to ensure a range of economic and social benefits for the region.**

It is estimated that the impact of the £120 million digital innovation programme over the initial ten years could be up to £722.5 million in additional GVA to Northern Ireland through increased productivity and investment in jobs in addition to the societal benefits identified.

## Increased regional productivity



**This will be achieved by:**

- Facilitating investment in R&D.
- Providing a mechanism for ideas to be fostered in response to Grand Challenges and leading to the creation of products and services
- Providing private businesses (particularly SMEs) with access to trial emerging technology that has the potential to enhance business efficiency
- Facilitating collaboration on a sectoral basis between further and higher education and industry, allowing ideas to move into development, higher TRL levels, and to market
- Directing the digital innovation ecosystem in an integrated manner for the region, linked to the emerging strategic context.

## Regional competitiveness



**This will be achieved by:**

- Bolstering existing sectoral and cluster specialisms, while building upon new sectors such as Health & Wellness and Sustainability & Resilience to enhance competitiveness;
- Provide access to the skills, infrastructure and capability by enhancing the training and experience of the labour force, aligned to sectoral strengths through the Innovation Centres of Excellence and Regional Innovation Hubs; and
- Providing funding mechanisms to attract firms to the Region to support development of products and services in response to Grand Challenges and Missions.

## Societal outcomes



Which contribute directly to the living standards of a society.

**These will be achieved by:**

- Building expertise and incentivising collaboration between industry and further

and higher education in response to Grand Challenges, including AI, Health & Wellness and Sustainability & Resilience

- Facilitating an enhanced level of public services to improve societal outcomes
- Integrate societal and environmental obligations into investing instruments.

## Digital capability



Improved digital capability and regional inclusivity.

**This will be achieved by:**

- Providing access to improved digital and connectivity infrastructure, such as 5G and wireless connectivity
- Providing access to wider enabling infrastructure such as access to high quality applications, systems and IoT and advanced technologies
- Providing access to digital skills provision to support business needs, as well as general digital literacy of the population.

## A strong and resilient digital skills base



Creating a strong and resilient digital skills base amongst our communities and a digitally connected business community is central to the BRCD Employability and Skills programme. The Skills for the Digital Future aspect of the programme will seek to integrate with and support the digital innovation investments by building our digital literacy from grassroots up and support the digital transformation of our businesses across the region.

**Key features of the programme include:**

- Developing core digital skills across our economy;
- Ensuring a suite of provision exists to support essential digital skills and job specific digital skills;
- Enabling inclusive growth by creating employment pathways into the digital sector or into digitally focused occupations; and
- Increasing the pace and scale of digital transformation amongst the regions small business community.

# Harnessing the opportunity: The project portfolio

**Collectively, the Funds and the Regional Innovation Hubs will provide the necessary financing and the enabling environment to support a large number of projects and programmes that will stimulate and grow the innovation ecosystem over the coming decade.**

Partners have worked closely with the further and higher education, local industry and public sector to identify a portfolio of transformational projects that can contribute to addressing the region's Grand Challenges while at the same time supporting SMEs in key industry growth clusters.

The following projects are offered to illustrate the types of opportunities that the investments can unlock.

The individual merits of project proposals will be considered by the Digital Advisory Board, which will select those brought forward for business case development.





## Belfast Smart District



The ambition for a Smart District acknowledges the importance of 'place-making' in fostering digital innovation, and the role of a world-class recognised district as a catalyst for innovation and economic growth as well as being an international showcase for the city and wider region.

The Belfast Smart District will harness collective knowledge, assets and investments to drive a transformative innovation and inclusive growth programme. It will foster place-based opportunities to collaborate on shared grand challenges and will be home to a vibrant community of researchers, corporations, SMEs, start-ups, incubators, and a highly engaged community.

This collaborative environment will draw from a deep well of research excellence and strong industry clusters in the digital economy including fintech, cyber security and AI, and exciting emerging clusters in life and health sciences.

The District will offer partners access to resources to support collaborative open innovation including advanced wireless infrastructure, shared data resources, and a regulatory sandbox environment to enable the early adoption of new technologies, services and regulations to address urban challenges, paving the way for faster city-wide adoption.

The District brings the complexity of large-scale deployment to a more viable neighbourhood area. At this scale, the city and its regional partners can plan, pilot and learn about approaches that can then be adopted across site-specific thematic testbeds.

Inclusion will be an important strand of the development of the district - with inclusive growth being embedded in the design and development of projects and programmes. The approach will seek to maximise the societal impact of investments through skills and capacity building programmes, community co-design and the collaborative work of industry and anchor institutions.

## Advanced wireless infrastructure

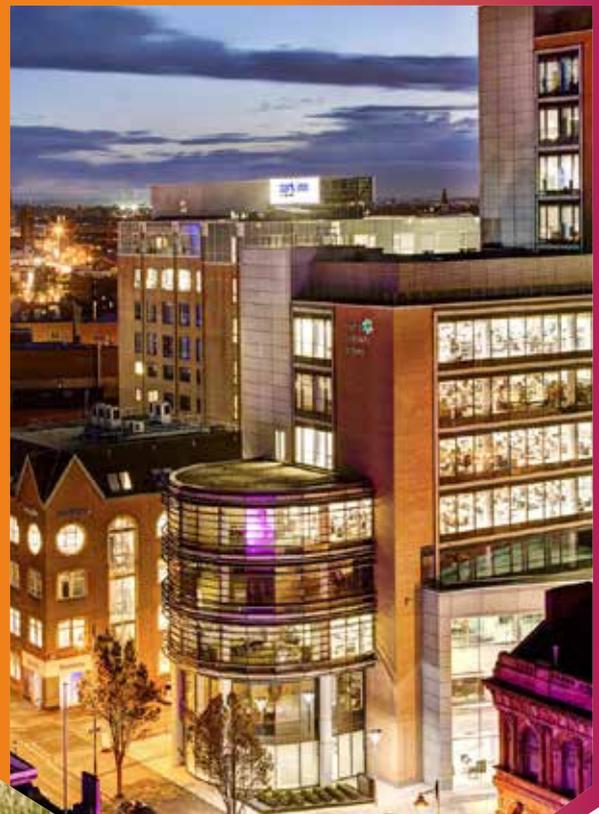


World-class advanced wireless connectivity sits at the heart of Belfast Region's digital innovation ambition and in time will become the key enabling technology for many products, services and programmes.

5G will deliver a step change of ultrafast, low latency, reliable, mobile connectivity. It will also provide greater capacity to support ever-larger data requirements, as well as wide-ranging new applications that will positively impact different industry sectors such as connected healthcare and advanced manufacturing. It will create new opportunities for people, businesses and public services.

To support and accelerate the deployment of wireless infrastructure in Belfast, Mobile Network Operators (MNOs) and smaller, new mobile entrants need access to real estate assets, such as building rooftops and street furniture, to install their mobile network equipment.

Establishing a Site-as-a-Service model will reduce barriers to deployment, encourage more timely investment in wireless connectivity by the private sector and help establish the Belfast Smart District as a national exemplar for innovation in connectivity.





## Data foundations for innovation



Data is key to collaborative innovation and the success of Belfast's digital innovation ambitions. To foster a supportive environment for the effective use of data and data-driven technologies, the region needs to address key issues such as siloed approaches to data collection, management and access, as well as a shared approach to AI, ethics and privacy.

The development of two data foundations will create the basic infrastructures and organisational processes that need to be in place to drive a digital transformation in the city.

The **Citizen Office of Data Analytics** will support partners in engaging directly with the citizen/end user in the design, development and deployment of data-driven solutions. It will also build the capacity of citizens to engage in data and innovative technologies, and support capabilities in the co-creation and co-design of data-driven projects being delivered by industry, further and higher education and the public sector.

The Belfast **Urban Data Platform** will provide shared resources to enable industry, further and higher education and the public sector to generate, manage and analyse data in ways that spur collaboration and open innovation. By providing common standards, APIs, an open architecture and shared expertise and technologies, the platform will enhance data discovery, sharing and access amongst partners and facilitate greater collaborative innovation, research, deployment and delivery of services within the city region.

## Digital twin



A digital twin is a fine-grain data model of a real-world physical object, process or service. They allow designers, engineers and planners to explore, design and monitor aspects of the real-world in a virtualised environment. By doing so they greatly reduce costs and risks and speed up the ability to test and experiment. The potential for such twins has grown rapidly over the past few years with the advent of low cost processing, AI, and IoT networks which together allow for the collection, manipulation and modelling of vast quantities of data.

The market for digital twins is growing rapidly as they become integrated into fields such as advanced manufacturing and the design of complex urban services such as mobility, health and energy management.

The Belfast region is well-placed to be at the forefront of research in the design and application of digital twins, with strengths in both local universities, and companies in emerging growth clusters that are in a position to exploit the technology.

A digital twin approach, underpinned by City Deal investment in advanced wireless connectivity (the basis for IoT networks), shared data infrastructure and the ability to develop ideas within the Smart District, provides researchers, industry and the public sector with a data-rich environment in which to explore innovative approaches.

Such twins have a specific role to play in the development and testing of mobility solutions as well as virtual testing of regulatory sandboxing, and the analysis of mobility and energy impacts of transportation systems.





## Towards net zero carbon



A range of proposals have been identified across the region including an Energy District in Belfast and the Kilroot Energy Park in Carrickfergus. Building on the region's existing strengths in the energy sector, as well as world-class research by the local universities, hydrogen and cleantech are key areas for innovation and development.

Opportunities exist to develop industries and initiatives to help meet our net zero carbon targets such as in the emerging hydrogen economy that is ideally suited to Northern Ireland. The nexus of academic excellence, manufacturing knowledge and capacity, renewable energy provision, engaged public and private sector partners and a well linked ecosystem alongside clearly identified demands provides an ideal opportunity for economic development.

By investing in enabling infrastructure, as well as providing a supportive 'urban sandbox' environment, hydrogen demonstrator projects in Belfast and other key towns can be further exploited. The development of a digital twin approach for hydrogen will provide a simulated environment for virtual modelling of energy solutions.

## Regional Innovation Hubs



The **i4c Innovation Centre at St Patrick's Barracks in Ballymena**, led by Mid and East Antrim Borough Council, will comprise of SME incubation labs and workshops, the iLAB (innovation laboratory) workshop and high-quality office accommodation including co-working space, supported by an environment to support open innovation, collaboration and economic growth.



The Mid and East Antrim Borough has existing strengths and assets in the cleantech sector and the iLAB facility will build on these, providing a fully staffed and equipped engineering-led 'industry makerspace' to support SME innovation activity. Likewise, the iLAB facility will include a cleantech demonstration space and training hub and will be the base for a Hydrogen Training Academy.

In addition to the i4c project, Ards & North Down Borough Council is developing proposals for the **Shed 1.0 project** which builds on the strong creative tech ecosystem for TV and film, games and sound production in the area. The hub will address the strong demand for accessible and flexible accommodation from growing firms in this sector to allow greater collaboration, access to expertise, equipment and technology and opportunities for growth. The plans include recording studios and mixing studios and presents new opportunities for a local skilled talent base working in partnership with the South Eastern Regional College (SERC).

Also, Lisburn & Castlereagh City Council is progressing initial plans alongside SERC for an **Entrepreneurship and Innovation Hub** which will support a wide range of business development activities promoting growth, productivity and practical problem solving.

Furthermore, and building on the **Newry City Centre Regeneration project**, Newry, Mourne & Down District



Council is progressing proposals around a digitally advanced space which stimulates innovation in core sectors such as creative.

## Next steps

**This document is an overview of the draft Digital Innovation programme which is part of the Belfast Region City Deal.**

During summer 2021 City Deal partners will work with Northern Ireland and UK Government Departments to achieve programme approval and agreement of the BRCD Document.

Programme approval will allow the further development of Outline Business Cases to unlock the identified opportunities.

For more information on the Belfast Region City Deal visit:

 [www.belfastcity.gov.uk/belfastregioncitydeal](http://www.belfastcity.gov.uk/belfastregioncitydeal)

### Or contact us

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 call: 028 9027 0276





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