

WATERFORD DIGITAL STRATEGY

2022- 2026



Comhairle Cathrach & Contae Phort Láirge
Waterford City & County Council



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MESSAGE FROM THE CHIEF EXECUTIVE

Digital resources and connectivity are transforming economic and social practices by changing how people interact and engage socially and in the workplace. High speed connectivity is essential for families and businesses across the country.

Building on this infrastructure is key to ensure the benefit are spread to rural towns and villages as well as the key urban areas.

Communities, Businesses and the Local Authority have an important role to play to ensure this growth happens in a balanced way.

The Waterford Digital Strategy prioritises 6 key themes, The Digital Economy, Citizen & Community, Digital Infrastructure, Smart City, Digital Council and Climate action. By working with all stakeholders, the Waterford Digital strategy sets out the objectives and actions to support the citizens of Waterford and its Digital Economy.



Michael Walsh
Chief Executive

“Communities, Businesses and the Local Authority have an important role to play to ensure this growth happens in a balanced way”

MESSAGE FROM THE CATHAOIRLEACH

This Digital strategy outlines a vision of a strong, inclusive, and sustainable Waterford. With an improved and widespread broadband infrastructure in place, County Waterford can have high speed broadband services. This will help develop County Waterford as an attractive place to do business, become a true destination for enterprise and will facilitate ability to remotely work in homes or local co-working facilities.

Waterford City and County Council is committed to enhancing and developing Waterford and making it a vibrant and sustainable place for all.



Cllr. Joe Kelly
Mayor of the City and
County of Waterford

“Waterford City and County Council is committed to enhancing and developing Waterford and making it a vibrant and sustainable place for all”



INTRODUCTION



1. INTRODUCTION

The Waterford Digital Strategy 2022-2026 sets out the city and county's ambitions in relation to the digital development of its communities and businesses. In doing so, it sets out some of the key challenges and opportunities that Waterford will face in the years ahead and how adopting a "smart" approach in addressing them can deliver real results.

The COVID-19 pandemic has radically changed the role and perception of digitalisation in our societies and economies and has swiftly accelerated its pace. Indeed, digital technologies have been critical to maintaining economic and social life throughout the crisis.

However, across Europe a new digital divide has also emerged, according to the European Commission, not only between well-connected urban areas and rural and remote territories, but also between those who can fully benefit from an enriched, accessible, and secure digital space with a full range of services, and those who cannot. A similar divide emerged between those businesses already able to leverage the full potential of digital environment and those not yet fully digitalised. In this sense, the Commission asserts that the COVID-19 pandemic has exposed a new "digital poverty", making it imperative to ensure that all citizens and businesses in Europe can leverage the digital transformation for a better and more prosperous life.

It is also important to note that the European Commission has been monitoring member states'

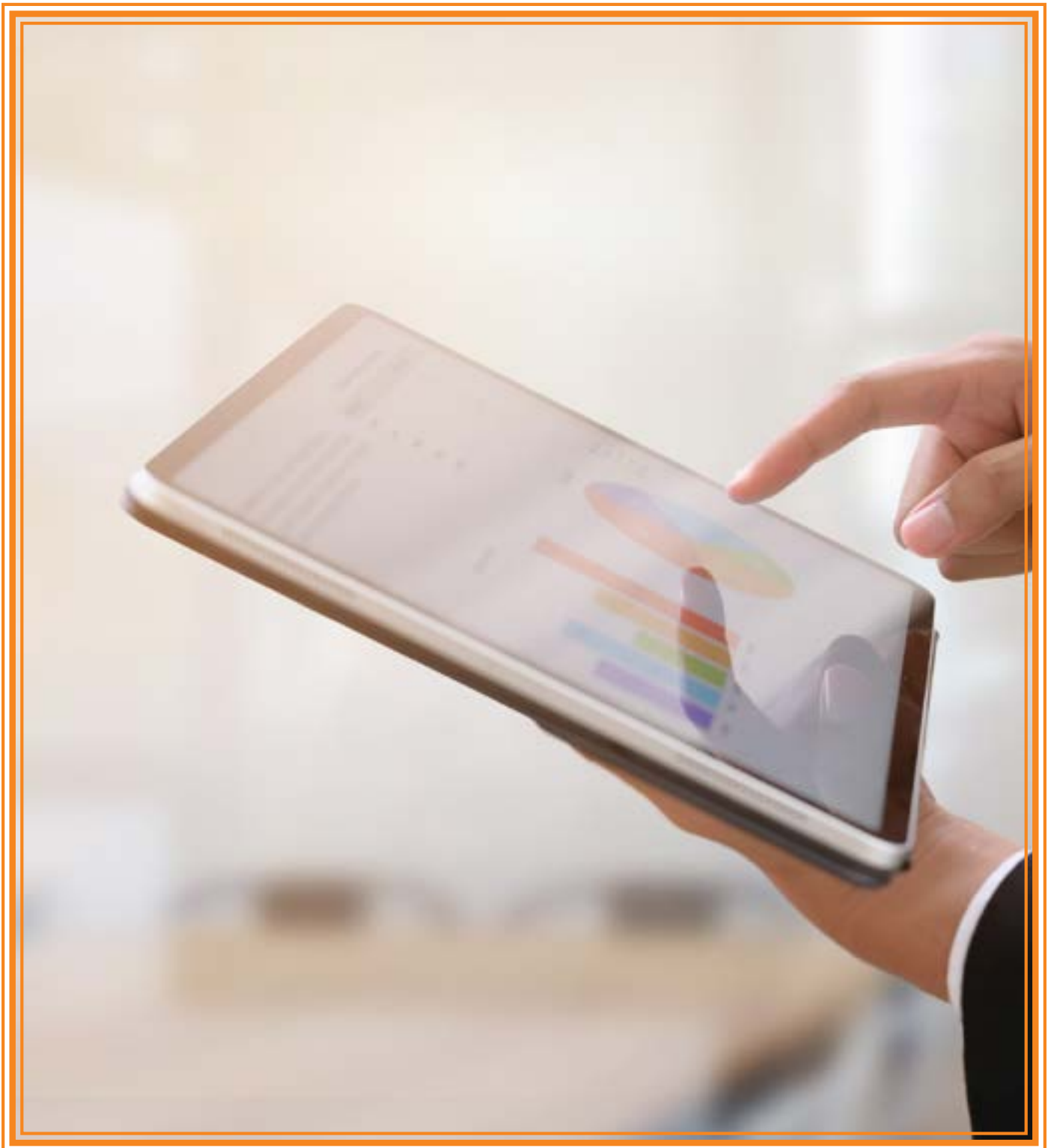
digital progress through the Digital Economy and Society Index (DESI) since 2014. Overall, Ireland ranked 6th out of 28 EU Member States in 2020 and has been the fastest growing Member State in the EU over the last five years. Based on data gathered prior to the COVID-19 pandemic, DESI 2020 highlighted that Ireland has maintained a leading position in the use of e-commerce by SMEs, and in the integration of digital technology. Further, Ireland entered the top ten for use of Internet by individuals and recorded a notable increase in its share of Internet users. It also maintained its top ten position in digital public services, where it excelled in open data and the provision of digital public services for businesses.

Thus, it has never been more critical for cities and regions across Ireland to demonstrate digital leadership and develop pathways to future proof their communities based on clear goals and targets.

The positive impact of advances in digital technology in our everyday lives will only grow into the future with the advent of Internet of Things (IoT) and Artificial Intelligence (AI), resulting in innovative and transformational development for healthcare and transport, in our homes, communities and work practices. Waterford Digital Strategy aims to enhance the digital maturity of the county and mobilise its strengths to become a smart, inclusive, and innovative place to live, work and visit.

Indeed, County Waterford is already undertaking a range of initiatives which support the pursuit and implementation of the various thematic strategic objectives set out in this Strategy. These are

presented throughout the document, together with additional case study examples both from the Irish context and internationally.



DIGITAL STRATEGY POLICY CONTEXT



2. DIGITAL STRATEGY POLICY CONTEXT

The development of the Waterford Digital Strategy 2022-2026 is informed by an evolving European and National Policy Context. The first phase of Ireland's Digital Strategy was published in July 2013. This strategy focuses on digital engagement and how Ireland can benefit from a digitally engaged society. It sets out a clear vision and a number of practical actions to help increase the number of citizens and businesses engaging online through industry and enterprise, citizen training, schools and education. Building on Phase 1, the government is looking to develop a new National Digital Strategy.

This is in response to technological change in recent years and the range of opportunities and

challenges this presents to Irish society. However, it will also be situated in the context of a post-COVID era, in which the pace of digitisation has rapidly accelerated. Indeed, the pandemic has placed a new urgency around overcoming digital divides and enabling the facilitation and further development of digitally literate and inclusive communities. As counties work to respond to and recover from the COVID-19 crisis, now is the moment to ensure an inclusive digital transformation, with coordinated and comprehensive strategies that build resilience and bridge digital divides for a post-COVID era. This section provides an overview of key policy developments seeking to inform and guide this shift.

2.1 Shaping Europe's Digital Future

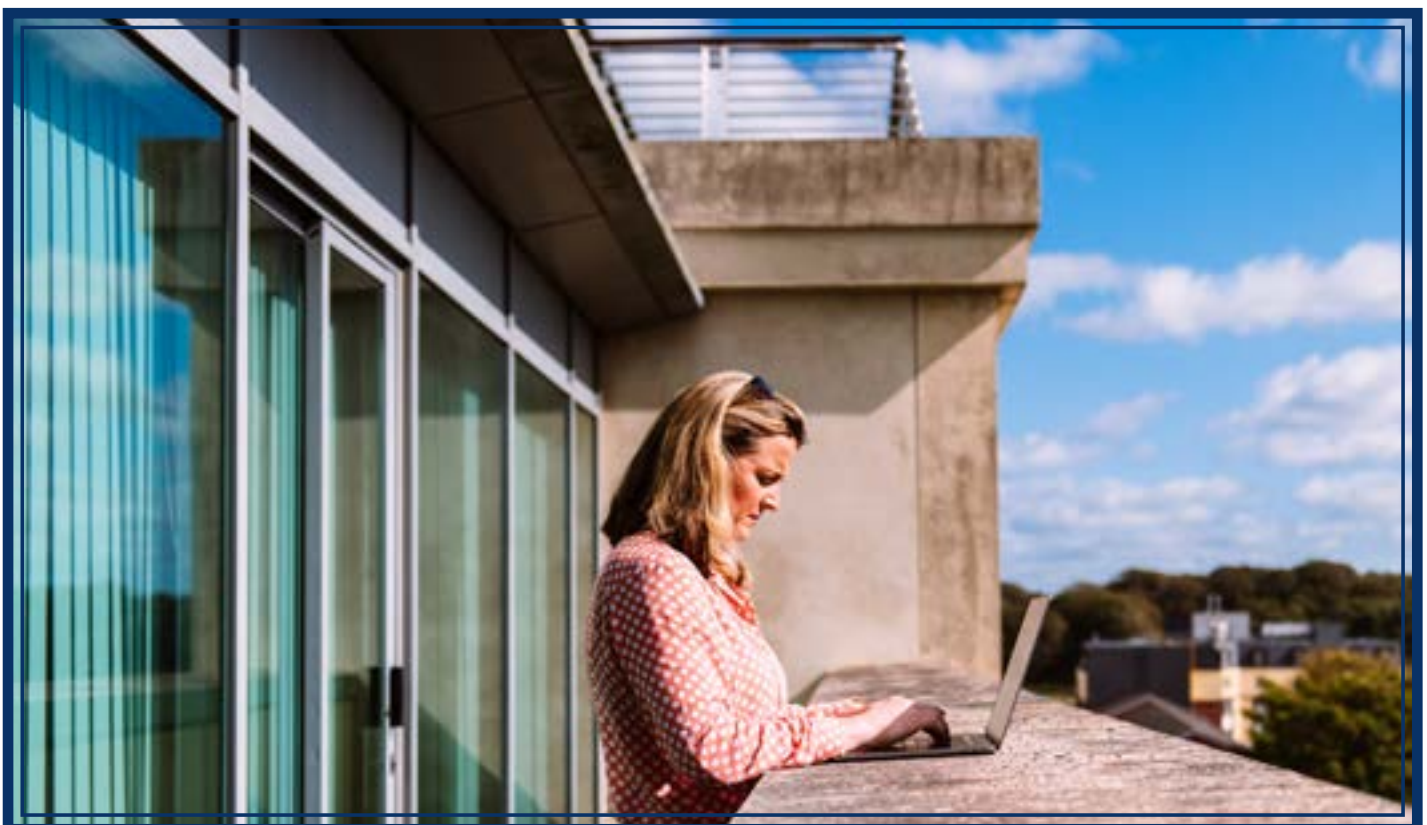
In February 2020, the European Commission published 'Shaping Europe's Digital Future'. It acknowledges that 'Digital technologies are profoundly changing our daily life, our way of working and doing business, and the way people travel, communicate and relate with each other. Digital communication, social media interaction, e-commerce, and digital enterprises are steadily transforming our world. They are generating an ever-increasing amount of data, which, if pooled and used, can lead to a completely new means and levels of value creation. It is a transformation as fundamental as that caused by the industrial revolution'. It also refers to the 'twin challenge' of a green and digital transformation across the EU, which must go hand in hand.

Key objectives of the plan include the development and deployment of the Internet for all in ways that will make a difference in people's lives.

A fair and competitive economy where any enterprise, big or small, has access to the same digital technologies that can boost their productivity and competitiveness. A safe digital environment to empower citizens in how they interact with technologies and in the data they provide. To achieve this, it is the strategies' goal for the EU to become an independent and purposeful actor in the delivery of digital technologies. Building on this work, in March 2021, the European Commission presented a vision, targets

and avenues for a successful digital transformation of Europe by 2030. This is also critical to achieve the transition towards a climate neutral, circular and resilient economy, the Commission asserts. As part of this, the Commission proposes a Digital Compass to translate the EU's digital ambitions for 2030 into concrete terms. They evolve around four cardinal points:

- 1 Digitally skilled citizens and highly skilled digital professionals;** By 2030, at least 80% of all adults should have basic digital skills, and there should be 20 million employed ICT specialists in the EU – while more women should take up such jobs;
- 2 Secure, performant and sustainable digital infrastructures;** By 2030, all EU households should have gigabit connectivity and all populated areas should be covered by 5G; the production of cutting-edge and sustainable semiconductors in Europe should be 20% of world production; 10,000 climate neutral highly secure edge nodes should be deployed in the EU; and Europe should have its first quantum computer;
- 3 Digital transformation of businesses;** By 2030, three out of four companies should use cloud computing services, big data and Artificial Intelligence; more than 90% SMEs should reach at least basic level of digital intensity; and the number of EU unicorns should double;
- 4 Digitalisation of public services;** By 2030, all key public services should be available online; all citizens will have access to their e-medical records; and 80% citizens should use an eID solution.



EU DIGITAL AMBITIONS FOR 2030

Building on this work, in March 2021, the European Commission presented a vision, targets and avenues for a successful digital transformation of Europe by 2030

80%

AT LEAST 80% OF ALL ADULTS SHOULD HAVE BASIC DIGITAL SKILLS



100%

BY 2030, ALL EU HOUSEHOLDS SHOULD HAVE GIGABIT CONNECTIVITY AND ALL POPULATED AREAS SHOULD BE COVERED BY 5G



20%

PRODUCTION OF CUTTING-EDGE AND SUSTAINABLE SEMICONDUCTORS IN EUROPE SHOULD BE 20% OF WORLD PRODUCTION



80%

CITIZENS SHOULD USE AN EID SOLUTION

2.2 The National Digital Strategy

The new National Digital Strategy “The Digital Ireland Framework” was launched in February 2022, with a list of ambitious new targets for 2030.

The Strategy covers a broad range of societal and economic areas including, infrastructure and security; data, privacy, and regulation; education and skills; trust, wellbeing and inclusion; digital public services, and innovation, the digital economy, and labour market changes.

- Making connectivity available to everyone including bringing 5G to populated areas.
- Providing digital skills for all – from school, to further and higher education, to life-long learning.
- Helping small businesses benefit from digital opportunities by providing grants and assistance.
- Investing in cyber-security to protect Irish citizens and businesses
- The Digital Ireland Framework sets targets in digital education, broadband coverage, digital services, business and the enforcement of EU regulations.

2.3 The National Planning Framework

The National Planning Framework (NPF) is a high-level strategy that aims to shape growth and development in Ireland out to the year 2040. The NPF is guided by a number of Strategic Outcomes. Strategic Outcome 5 relates to ‘A Strong Economy Supported by Enterprise, Innovation and Skills’. It states that a competitive, innovative and resilient regional enterprise base is essential to provide the jobs and employment opportunities for people to live and prosper in the regions. Indeed, it further asserts that “In order to future proof our competitiveness, we must develop a skills base that will move Ireland to the forefront of digital and innovative activity”. A key strand of this is developing the potential offered by connectivity and digitisation of rural areas and the better use of knowledge, for the benefit of inhabitants and businesses. This, the Strategy states, can include

e-literacy skills, access to e-health and other basic services, innovative solutions for environmental concerns, circular economy application to agricultural waste, promotion of local products supported by technology and ICT, implementing, and taking full benefit of smart specialisation agri-food projects, tourism, and cultural activities.

Moreover, data innovation is recognised as important for future growth. Harnessing the potential of the data economy can bring considerable benefits in terms of productivity, new services, and knowledge creation, according to the NPF. It is also recognised that emerging disruptive technology and innovation has the potential to accelerate the delivery of NPF National Strategic Outcomes.

2.4 The National Broadband Plan

The National Broadband Plan is the government's plan to deliver high-speed broadband services to all businesses, farms, and households in Ireland. It will ensure that everyone in Ireland will have equal access to a high-speed broadband service. Actions of the NBP include commercial investment by the telecommunications sector and state intervention in those areas where commercial providers acting alone will not provide this essential service.

National Broadband Ireland is appointed to build, operate, and maintain the state provided network and services and carry out this work into the future.

NBI will sell services to retail service providers who will then offer high-speed broadband services to home and business customers.



2.5 Making Remote Work: National Remote Work Strategy

The National Remote Work Strategy outlines the many benefits of remote work including more free time, new opportunities for those who live in rural Ireland, greater footfall and spend to Ireland's smaller towns and villages, enabling balanced regional development, reducing commuting times and transport related carbon emissions and air

pollution. However, the need for this strategy comes from a series of challenges that new work models can present, such as the lack of adequate remote working infrastructure, unsuitable environments for home working, negative effects on mental health, and the lack of space for creativity and collegiality.

The government have met these opportunities and threats with actions categorised into three pillars.

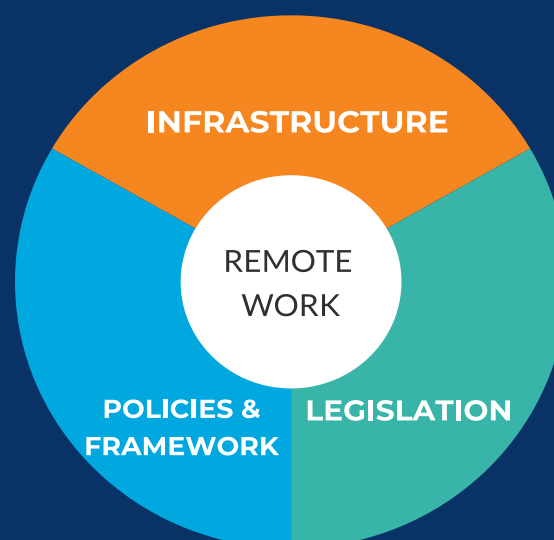
Pillar 1 will address the requirements to create a conducive environment for adopting remote work. This action is underpinned by three conditions, including legislation on the right to request remote work, the development of a Code of Practice on the right to disconnect, and the provision of data-based evidence-led best practices on remote work.

Pillar 2 focuses on the development and leveraging of remote work infrastructure. It is underpinned by the investment in remote work hubs and infrastructure in under served areas, the development of national data on hub infrastructure, tracking the impacts of remote

work, and exploring how to accelerate the delivery of national broadband.

The focal point of the **Pillar 3** is to build a remote work policy and guidance framework to inform the development of future policies, so they maximise the full benefits of remote working. The delivery of this last pillar will see the development of national data on remote work to provide an evidence base for future policy and a cross-departmental knowledge base on costs and benefits associated with increased adoption of remote working. It is the vision of this strategy to ensure remote work is a permanent feature in the Irish workplace in a way that maximises economic, social and environmental benefits.

PILLARS



2.6 Our Public Service 2020

Our Public Service 2020 is a framework to support development and innovation in the public service across Ireland, with actions aimed at building stronger and better-quality services to the people of Ireland.

The strategy aligns with Waterford's digital strategy, particularly in its goal to deliver public

services to citizens more efficiently with the use of new technology. Adopting new digital advances will improve service quality and delivery and service accessibility through the development of digital services and eGovernment.

2.7 Future Jobs Ireland 2019

Future Jobs Ireland 2019 provides a clear understanding that technology continues to herald new ways of doing business with new economic opportunities for Ireland and its regions.

The government makes a clear commitment to focus on 5 pillars: embracing innovation and

technological change; improving SME productivity; enhancing skills; developing and attracting talent; increasing participation in the labour force and transitioning to a low carbon economy.

Future Jobs Ireland 2019 provides a clear understanding that technology continues to herald new ways of doing business with new economic opportunities for Ireland and its regions



VISION



3. VISION

This Digital Strategy will be citizen-centric; the aim is to build a digitally empowered society, enabling citizens and communities to flourish. The strategy will help drive economic growth and ensure greater public participation in the digital economy. It will help position Waterford as a digital powerhouse while improving citizen's quality of life.

The strategy will provide a roadmap for development of a “Smart Waterford” over the 5 years up to 2026.

It will:

- Ensure Waterford makes best progress on Broadband roll out and maximise the benefits that can bring to all citizens especially in rural areas
- Build and promote Waterford's role as a Smart City within the South East region
- Provide a focus for the Council's engagement with a range of external stakeholders including local “digital champions”
- Leverage the “digital” actions already identified in a range of other Council strategies and help align/co-ordinate the digital strategies of other public agencies at local level.
- Access to online Council services
- Enhanced job creation prospects as a result of the digital economy

A Smart Waterford can only be achieved by collaboration between Waterford City and County Council, other state agencies, educational and training bodies, private sector companies and by engagement with citizens and elected representatives. In order to promote an inclusive digital strategy for Waterford a consultation process was undertaken. This involved digital strategy issues paper which was put out for public consultation for a period 4 weeks.

Waterford's Community Response Forum is working on ways to improve access to Internet services. This Group aims to improve access to online services and to address the identified needs of people who would value support and help in using computers, smart phones and tablets and to reach out to those who have no access at all.

The survey was circulated by CRF members and through the networks of other members of the Subgroup both online and in hard copy with both Irish and English language versions available. The Subgroup also asked people to identify people they knew who were not using the Internet and they fed back the results on their behalf. Further details on the consultation process and the results of the survey are included in consultation chapter

A Smart Waterford is not just about Internet connectivity or technology - it is essentially about people; improving quality of life and building resilient and sustainable communities across Waterford's City & County.

3.1 Principles

The development of the digital strategy for Waterford and associated actions, plans and policy initiatives will be underpinned by the following principles:

QUALITY OF LIFE

We will promote the well-being and quality of life of citizens and communities through the delivery of high-quality services

PUBLIC SERVICE

We aim to continually improve our services to deliver better outcomes for the public and to build an agile and resilient organisation which communicates and engages effectively

PEOPLE FOCUSED

Initiatives are designed with the citizen at the centre

TRANSPARENCY

Digital Strategy initiatives will be open by default, using open architectures, open data, and open standards, ensuring that they enable unrestricted collaboration, sharing and transparency

VALUE FOR MONEY

We will ensure that we spend smarter for smart initiatives, using partnerships to share costs and define projects that create value for all partners involved



STRATEGIC THEMES



4. STRATEGIC THEMES

The Digital Strategy will focus on 6 key areas to mirror the strategic themes of the Corporate Plan for Waterford City and Council for the period 2022-2026:

WCCC Corporate Plan	Digital strategy focus
Rural and urban Development	Digital Economy
People & Community	Citizens & Community
Strong Foundation	Digital Infrastructure
Fit for Purpose Organisation	Digital Council
Creating Growth /Innovation	Smart City
Cross cutting theme	Climate Action

In addition, it also focuses on climate action, which represents a cross cutting theme with implications across all of the strategic objectives. Indeed, climate change represents another transformative policy megatrend alongside digitisation over the next decade and beyond. These policy strands are very much intertwined. Ireland is taking proactive steps to building an environmentally sustainable, and climate-neutral economy by 2050.

The roadmap to achieving this target is underpinned by the Climate Action Bill which commits to a 51% reduction in carbon emissions by the end of the decade. It is clear that digitalisation and new technologies will play a critical role in this change.

Each of the following sub-sections are organised as follows:

● **Introduction to the Strategic Theme:**

This broadly introduces the wider context for the theme inclusion as well as key ambitions within it.

● **Strategic Objectives:** Each of the themes have a number of associated objectives to guide progress towards the overarching Digital Strategy vision.

● **Waterford Case Study:** These sections track progress within County Waterford through highlighting key initiatives or interventions (both existing and planned)

● **Good Practice Exemplars:** These sections provide an overview of both Irish and international policy and practice in this arena. Key learnings or potential implications for the Waterford context are highlighted.



4.1 Digital Economy

Broadly, the digital economy relates to any economic activity that results from online connections. Data underpins the digital economy and helps us to connect, discover, communicate, work and learn online efficiently. This has never been more important than in recent times dealing with the impacts of the COVID-19 pandemic.

As governments across the world took action to reduce social interaction, businesses had to adapt by introducing alternative working arrangements (including working from home in many cases).

Internet traffic in some countries increased by up to 60% shortly after the outbreak³, underscoring the digital acceleration that the pandemic sparked.

It is now unlikely that economies and societies will return to “pre-COVID” patterns; the crisis has vividly demonstrated the potential of digital technologies and some changes may now be too deep to reverse, according to the OECD.

Ireland has typically scored well in this domain in the European Commission DESI index. Indeed, in 2020 Ireland maintained the top position in the integration of digital technology category (based on data collated prior to the pandemic). Small and Medium Enterprises (SMEs) specifically excelled in e-commerce, where Ireland led in all three indicators – selling online, e-commerce turnover and selling online cross-border. The study revealed that 29% of Irish SME’s turnover came from online sales, which is almost three times the EU average of 11%. Further, Irish companies ranked relatively high on the use of big data (20%), cloud services (33%) and social media (44%). At county level, efforts must be made to retain and enhance this performance over the longer term.

Fast and reliable connectivity facilitates interactions between people, organisations, and machines, and enables the use of connected devices in critical contexts, including health, manufacturing and transport.

This enabling infrastructure (as further discussed in Section 4.3) is a key determinant of a successful digital economy. Waterford’s Digital Strategy will help facilitate the growth of broadband infrastructure in towns, villages, and local communities, ensuring access for all to high-speed internet. The roll-out of broadband should stimulate employment in rural areas, which will be a help boost the local economy. Availability of broadband will also create secondary jobs for existing local businesses and enterprises struggling to compete in the current digital economy. During the lifetime of the strategy, the potential for major growth for individual sectors of the local economy through the adoption of digital technologies must be explored, e.g. agri-tech, tourism, retail. For example, enhancing the culture and festival offering would make Waterford a longer stay destination for visitors. There will be ongoing proactive work with Tourism stakeholders to expand the digital offering in relation to promotional activities, provision of information online and exploring innovative tourism products such as virtual reality attractions.

In addition, fast and reliable connectivity will also be critical if remote working is to be a feature of our working life going forward. As part of the Government’s ‘Making Remote Work – National



Remote Work Strategy, a key national action is stated to be ‘mapping and investing in a network of remote working hubs across Ireland’. There are already a significant number of remote working hubs across the country which are a national, regional and local economic asset. Within County Waterford, there are currently 10 such hubs with varying numbers of hot-desks available. As the National Remote Working Strategy highlights, working from hubs can help to combat the known risks of isolation and loneliness and assist with balanced regional development. Hubs have the potential to allow workers to live and work in a place of their choosing, reduce commuting times and reduce traffic congestion. They also offer employers a chance to reduce their business costs, improve staff retention and access a greater pool of talent.

The use of remote working hubs can also have a transformative impact on local economies and communities and can facilitate a more equal geographical distribution of high-value knowledge economy roles.

In facilitating more people to work locally, there will likely be greater local footfall and spend across towns and villages. Planning for the future delivery of hub type developments must thus be undertaken in a strategic manner, informed by data around existing occupancy and demand for hubs and hot desks across the county.

In seeking to adapt in a post-COVID era, any obstacles to the digitisations of businesses must be rapidly addressed. One such obstacle is the digital knowledge gap, which is caused by low levels of digital literacy among owners, managers and employees. Addressing these shortcomings will be vital to ensure a robust recovery. New skills development courses will be needed across the county in areas such as Digital Strategy Development, Digital Marketing, CRM, Social Media, and Cybersecurity.

For many businesses though, the question is not whether to trade online, it’s how to start. Designed to assist small businesses, the Trading Online Voucher Scheme offers training and advice, along with financial assistance of up to €2,500. This programme was developed under the National Digital Strategy, funded by DECC and delivered by the nationwide network of Local Enterprise Offices (LEOs).

The scheme is aimed at businesses with limited online trading presence and:

- ten employees or less
- €2 million turnover or less
- at least six months trading

HUB	Location	Office Spaces (Units)	Hot Desks
Arclabs	WIT West Campus, Carriganore	16	12
Boxworks	40 Patrick St, Waterford	10	22
Dungarvan Business Centre	Fairlane, Shandon, Dungarvan	9	9
Dungarvan Enterprise Centre	Old Friary Building, Lower Main street, Dungarvan	10	5
Dunhill Ecopark	Ballyphilip, Dunhill, Co Waterford	12	9
Fumbally Exchange	Bricklane, Viking Triangle, Waterford City	3	0
Innovation House	Main Street, Tramore, Co. Waterford	5	6
South East BIC Ltd	Unit 1B, Industrial Park, Cork Road, Waterford.	6	6
Tallow Enterprise Centre	Tallow	0	0
Waterford City Community Enterprise Centre CLG	Waterford Business Park	27	9

4.1.1 Strategic Objectives

- **Leverage actions within the LECP to help deliver digital opportunities for rural enterprises**
- **Develop a Rural Strategy for Waterford to include “Digital” objectives**
- **Support the delivery of Digital Hubs in most appropriate locations**
- **Support training for SMEs on the opportunities and the benefits Digital offers**
- **Pursue data around occupancy and usage of existing hubs to determine demand for further digital hubs in Waterford**
- **Engage with the Waterford LEO to determine target and baseline for numbers of SMEs receiving training on digitalisation opportunities and benefits**



4.1.2 Waterford Case Study

Working to deliver a Digital Hub in An Rinn Gaeltacht



gteic (Gréasán Digiteach na Gaeltachta) is a network of innovation & digital hubs with high-speed broadband connectivity being developed by Údarás na Gaeltachta in locations throughout Ireland's Gaeltacht Area. The innovations hubs are being delivered along the Wild Atlantic Way in Donegal, Mayo, Galway, Kerry and Cork in addition to Waterford and Meath in Ireland's Ancient East. Six Gaeltacht islands and seven non-Gaeltacht islands also form part of this growing digital ecosystem which is providing vital infrastructure and facilitating worldwide connectivity to these rural areas.

Seven hubs have been opened to date; it is expected that a further seven gteic hubs are on track to be completed and welcoming customers by the end of 2019.

The gteic digital hubs will provide a vibrant network of high-speed broadband facilities in rural Gaeltacht areas to stimulate job creation, to assist remote working, to encourage and enable

the return of Diaspóra na Gaeltachta, to facilitate concept development and new business and to develop a community of hubs where the unique Gaeltacht culture drives creativity and innovation.

See <http://www.udaras.ie/forbairt-fiontraiochta/gteic>

The Council will continue to work with other stakeholders to deliver a Digital hub in the Old Parish area. This would complement the digital ecosystem already in place with companies like Nemeton (media production company) who pride themselves on operating in rural County Waterford:

“Our HQ is in Waterford, on a beautiful coastline in an area steeped in the ancient Irish culture of storytelling, myth and legend.....We produce great content for TV and the web, we deliver content via satellite & streaming and we train and educate people in all of this”

See <http://nemeton.ie/about>

4.1.3 Dungarvan Case Study

Dungarvan Digital Transformation Hubs



Dungarvan Digital Transformation Hubs (DDTH) will provide remote working facilities in the town centre for a wide range of enterprises and people across the region, including connectivity for rural dwellers and realise capacity for 190 people working in Dungarvan town centre.

It will also help provide digital knowledge, skills and innovation programmes, supports and services, along with connectivity to major Research & Innovation and Knowledge Creation centres, such as Waterford Institute of

Technology, University College Cork and The Irish Manufacturing Research Centre.

<https://waterfordcouncilnews.com/2022/01/06/rrdf-funding-announced-for-dungarvan-digital-transformation-hub-ddth/>

4.1.4 Good Practice Exemplars

International Case Study: Digital Villages in Germany

The Digital Villages project implemented in Germany indicates how digitisation can help rural regions address the challenges of demographic change and depopulation and open up new opportunities for economic and community development. Initiated in 2015 by the Ministry of Internal Affairs and Sports Rhineland-Palatinate and coordinated by the Fraunhofer Institute for Experimental Software Engineering (IESE) the project focused on the three communities of Eisenberg, Göllheim and Betzdorf-Gebhardshain.

Under the project motto of “From the country for the country” the key focus areas of the Digital Villages project were local products and services, voluntary work and communication

<https://translate.google.com/translate?sl=auto&tl=en&u=https://www.digitale-doerfer.de/>

Through a process of stakeholder engagement and experimentation, the project saw the development of dedicated and integrated mobile apps and web services for use by residents in the region that targeted these key focus areas. The BestellBar app constituted a local online marketplace through which local vendors can register and sell their products online. When an order was registered through this marketplace another associated app, LieferBar, generated a delivery which local volunteers could then take up and complete. The ethos behind this system was that local residents travelling on the required route could deliver a parcel to their neighbour, helping to promote social interaction and cohesion within communities. Volunteers

who completed deliveries also earned DigiTaler, a type of digital currency that could be spent within the BestellBar app. Together these two apps targeted the focus areas of local economy and volunteerism. Within 3 months of the apps launch in 2016 over 800 items were purchased and 200 voluntary deliveries had been made (European Network for Rural Development, Digital Villages Germany Working document).

To tackle the area of communication the project saw the development of DorfNews, a local news portal through which rural municipalities and community organisations could upload and inform residents about local news and events. This local news portal was extended by the development of the DorfFunk App, which enabled users to access local news, organise events, coordinate carpooling and other utilities with their mobile phone.

The Digital Villages project and the development of dedicated digital tools to tackle rural issues provides a precedent as to how the Waterford Digital Strategy can deliver objectives around rural economic development and communications.

Key Learnings and Implications for Waterford Digital Strategy

- Digitisation has the potential to support local businesses and economic development, including in rural areas.
- Stakeholder engagement can help ensure that digital tools and solutions align with local interests and priorities.



Citizens and
Communities relates
to the development
and support of digitally
empowered citizens and
communities

4.2 Citizens and Communities

This theme relates to the development and support of digitally empowered citizens and communities. Digital skills are the backbone of the digital society. They enable people to use digital services and engage in basic activities online, especially when mobility is restricted. The COVID-19 crisis has underlined the criticality of such skills and has demonstrated where key gaps or, what the European Commission refers to as areas of 'digital poverty' remain. Moreover, basic digital skills for all citizens and the opportunity to acquire new specialised digital skills for the workforce are a prerequisite to participate actively in the Digital Decade, as explained in the European Skills Agenda.

The aim of Waterford LCDC is to develop, co-ordinate and implement a coherent and integrated approach to local and community development.

The membership of the LCDC includes local councillors, local authority staff, representatives of public bodies which provide services in the area; local community (Public Participation Networks or PPN) representatives; and representatives of local development bodies. The LCDC shall seek to co-ordinate aspects of the represented organisations' Digital Strategies for the benefit of citizen and communities across Waterford. The Skills Development LCDC subcommittee shall consider and recommend on how digital and new media skills shortages may be addressed over the term of the Strategy.

Rural Development:

Consideration will be given by the LCDC to allocating additional Rural Development Programme funding towards supporting capital investment in digital and new media initiatives in rural areas.

Public consultation:

In co-operation with the PPN, the Council will use digital technologies to increase public participation rates and ensure effective representation of the public's views. The Council will use digital media to engage the public in the development of a new Local Economic and Community Plan. Engaging young people in planning for the future of Waterford is important. Consultations with young people must take cognizance of the need to hear the views of young people in ways which are compatible with their expectations, hence use of digital media is crucial.

4.2.1 Strategic Objectives

- **Use digital technologies to increase public participation rates in public consultation processes.**
- **LCDC to seek to co-ordinate organisations' digital strategies for the benefit of citizen and communities across Waterford**
- **Seek to increase investment in the development of existing and new media businesses in rural areas**
- **Continue to promote digital technology offering & supports available through the Library network**
- **Establish a Network of Digital Champions across Waterford City & County**
- **Pursue data regarding usage of digital technology offerings and supports in libraries in Waterford to determine demand**
- **Pursue data regarding public participation using digital technology to determine baseline**



4.2.2 Waterford Case Study

Engaging Internal and External Voice of Customer to Improve Local Government Service Excellence - Festival Grant Application Process

The public sector today is operating in an increasingly complex environment, serving a more diverse population with higher expectations of service delivery. Building on the success of internal process improvement in WCC there is now a real requirement to collaborate with all our users in finding solutions to improve service excellence. The focus must be on engaging more with our citizens and not reacting to service demand, lifting and shifting inefficient services online.

The Digital revolution is calling for citizens to adapt to the ways of accessing services and involving citizens in these changes is necessary to build systems that work. Waterford City and County Council has moved beyond just consultation towards early engagement of all users, ensuring the discovery of problems and development of solutions that would not have otherwise been identified.

Co-designing the solution together through problem solving workshops and feedback through each stage of the design process is a shift away from designing for people to designing with people. The user-led innovation is creative and iterative, framing and solving problems using reflective practice to develop knowledge.

This improvement initiative, focusing on a more agile and integrated approach has resulted in a new festivals website portal, containing an on-line application process, training tutorials and FAQs co-designed by all participants. The shared journey has ensured long term efficiencies in service delivery and a new focus on end user value.

4.2.3 Good Practice Exemplars

International Case Study: Addressing Digital Inclusion in Manchester

In 2020 the Covid-19 crisis underlined the importance of digital inclusion and the access to online utilities and services for all citizens. The City of Manchester takes a proactive approach to promoting digital inclusion and ensuring that all residents have equitable access to the infrastructure and training required to make the most of the services and opportunities arising from digital connectivity.

A report produced by The Good Things Foundation and Liverpool University in 2020 suggested that digital exclusion was a major issue in the City of Manchester and the Greater Manchester region, with almost 1.2m residents lacking the infrastructure tools or training necessary they need to access and utilise online services. In response the City launched the Digital Inclusion Agenda for Change for Greater Manchester, with ambition to make Manchester a 100% digitally-enabled city region by 2023 (<https://www.greatermanchester-ca.gov.uk/what-we-do/digital/digital-inclusion-agenda-for-change/>). To date a number of actions have been launched to promote inclusion and connectivity. The Greater Manchester Technology Fund aims to support young students who are facing barriers to online learning. To date the Fund has supported some 3,500 students with a laptop or tablet device and data packages to ensure access to online learning opportunities (<https://www.greatermanchester-ca.gov.uk/news/greater-manchester-police-donate-2-400-tablets-to-the-greater-manchester-tech-fund-to-support-communities-who-face-digital-exclusion/>).

Many of the devices provided under the Fund are donated by members of the public and community organisations before being repurposed and redistributed to those in need, providing the added bonus of reducing waste and contributing to a circular economy.

Manchester City Council also provides an ongoing inclusion support service that helps ensure that residents of all ages and abilities have the skills necessary to use the Internet effectively. Advice and guidance are provided on a range of issues, from setting up a personal device, creating an email address, communicating with friends and families and booking GP appointments.

This service is also supported by local volunteers, who will contact users and help them address their specific problems (<https://manchestercommunitycentral.org/volunteer-centre-manchester/crisis-volunteering/6741>).

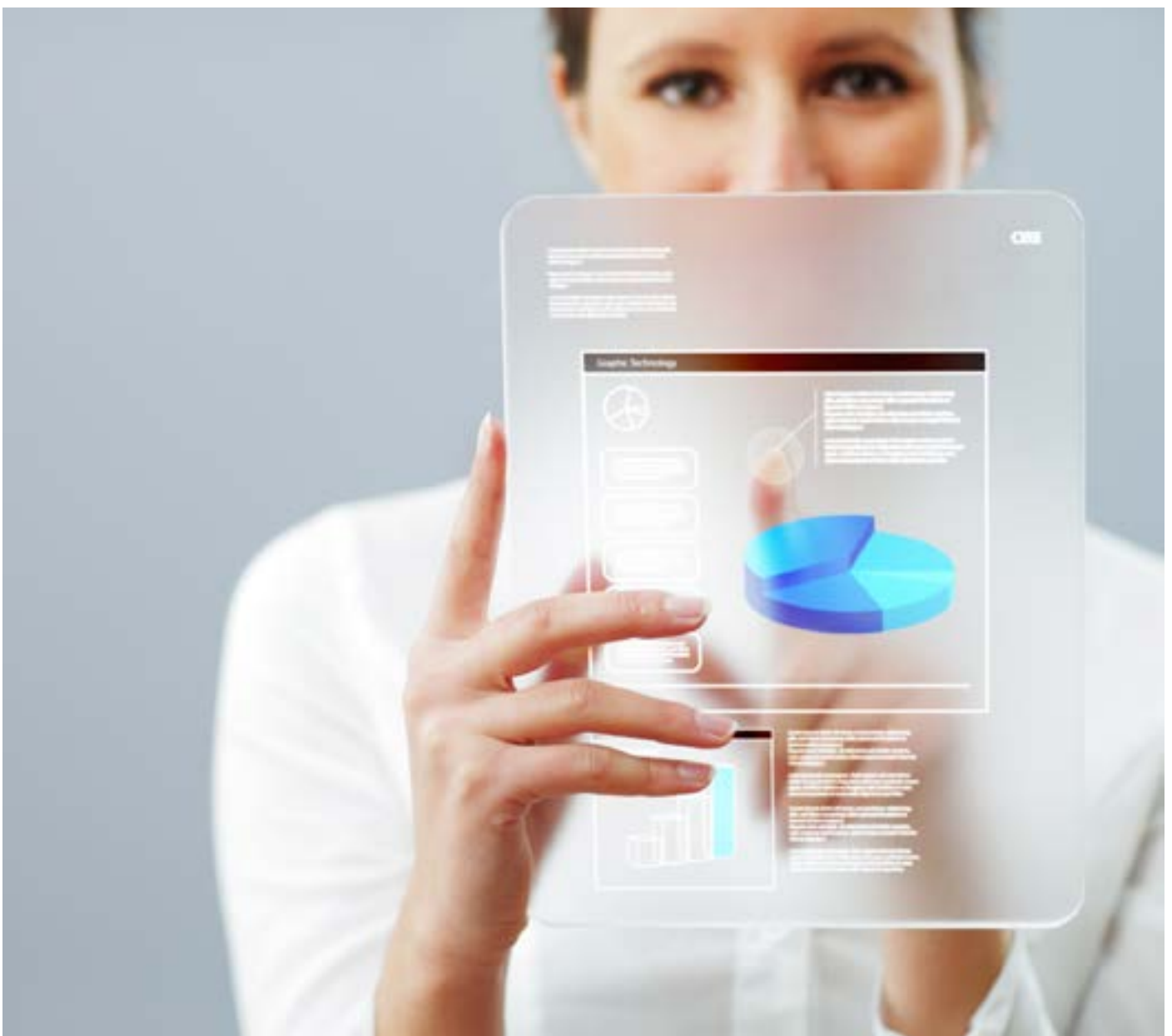
Manchester's Digital Inclusion Agenda provides an indication of how objectives under the Waterford Digital Strategy for digital training and education can be delivered to help tackle digital exclusion.

4.2.3 Good Practice Exemplars

International Case Study: Addressing Digital Inclusion in Manchester (cont.)

Key Learnings and Implications for Waterford Digital Strategy

- The importance of tackling digital exclusion across all age cohorts, particularly in light of the Covid pandemic. As online and blended learning approaches become more prevalent there is a need to ensure that students have proper access to devices and infrastructure to access education opportunities.
- The potential to leverage volunteer and community support to tackle digital exclusion.
- The reuse, recycling and redistribution of technology to reduce waste and support wider goals around sustainability and achieving circular economy.



4.2.3 Good Practice Exemplars

International Case Study: Digital Participation in Barcelona

Over the last decade Barcelona has seen the rapid uptake and deployment of digital technologies across various urban systems. Today it serves as a world-class example of how the IoT can be leveraged to improve city performance, combat congestion, reduce emissions and help support community participation.

Barcelona employs and maintains an integrated network of digital sensors that connect and send information to Sentilo, an open-source software platform that collects and processes this information for use by the City. Digital sensors are employed across a number of different urban infrastructure and systems. For instance, digital sensors embedded underneath the asphalt at public parking spaces can inform drivers what spaces are free and where they are located, helping to reduce congestion and vehicle emissions. Traditional streetlights have been replaced with energy efficient LEDs which are controlled by sensors embedded in public lampposts. These sensors can detect when pedestrians are in close proximity, brightening and dimming the streetlights to ensure suitable light provision. This helps reduce energy costs, with the sensors also collecting information on air quality and street activity to feed into the city's database. (<http://www.barcinno.com/barcelona-smart-city-technologies/>).

Perhaps most innovative is Barcelona's implementation of Decidem (translated as 'We Decide' in English), a dedicated online platform to help citizens engage in and shape the planning

and decision making process. Decidem provides residents of Barcelona access to dashboard with links to public data sets compiled from digital sensors, healthcare information and administrative open data. Users can read this data and then use the dashboard to engage in a participatory planning process by formulate policy proposals or urban interventions, commenting on existing proposals and tracking proposals as they go through the decision making process. In this manner Decidem has become an important part of Barcelona's governance. The formulation of the 2016-2019 Municipal Action Plan benefited from this participatory process, with citizens engaging, proposing and commenting on the policies and actions included in the final plan. More recently in 2019 the City adopted an Action Plan for the Parc de Montjuïc area, which again contains recommendations and actions directly arising from this digital participatory process (<https://ajuntament.barcelona.cat/digital/en/digital-empowerment>).

The innovative approach adopted by Barcelona shows how efforts can be made under the Waterford Digital Strategy to deploy new digital tools to improve urban performance and participation in the public consultation process.

4.2.3 Good Practice Exemplars

International Case Study: Digital Participation in Barcelona (cont.)

Key Learnings and Implications for Waterford Digital Strategy

- The implementation of real-time data sensors can help support and improve the efficiency of everyday urban operations processes.
- Digitisation has the potential to improve the participatory planning process by fostering inclusion and transparency.



Case Study: Cork Smart Gateway



Cork Smart Gateway was established by Cork City Council, Cork County Council, Nimbus Research Centre and Tyndall National Institute to pursue and facilitate the delivery of the Cork smart agenda of positioning Cork as a 'World-Class Smart Region'.

The Smart Gateway aims to enhance the reputation of Cork as an attractive place to live, work, visit and invest. A place where 'public infrastructure and public service provision utilise best in class technology solutions' and one which allows all stakeholders to participate in decision making and enjoy an enhanced environment. This initiative will compliment and support the already large number of organisations in Cork who are working on smart solutions to improve the physical realm, from energy conservation to open data. The Smart Gateway will create a forum to allow these organisations to share and collaborate while also marketing the Cork region as a smart destination internationally.

One aspect of the Smart Gateway which promotes the benefits of both e-governance and

e-government is the Cork Open Data service, an online public dataset service. While the Open Data service provides datasets for use in research, academia and technology development, it also provides citizen services such as real-time information on car parking availability in council-operated car parking, electrical vehicle charging locations, city libraries and Wi-Fi locations among others. Though data is displayed within the Open Data website as raw data, datasets are updated regularly.

Key Learnings

- The use of traditionally specialised and research-based datasets in accessible online civil services can help build digital infrastructure for smart city regions and its communities
- Smart city online platforms can provide an interface for citizens and stakeholders to both engage with their communities, local government and gain digital literacy through digital participation

4.3 Digital Infrastructure

Household access to a fast and reliable broadband connection (including fixed and mobile connections) is crucial in the current context, with a greater number of public and economic services and activities delivered online in response to the Covid-19 pandemic. A secure and stable broadband connection is also vital for SME's and local businesses to remain viable and competitive. A modern and robust digital infrastructure is required to provide the necessary covered for such services. As a result of the covid-19 pandemic networks have faced significantly greater levels of demand, whilst at the same time having to provide broadband-enabled services.

The Digital Strategy sets out a number of objectives to ensure that the required digital infrastructure is provided and maintained across Waterford City and the rest of the County.

The Broadband Development Officer for Waterford will work as part of a wider Council team to support broadband roll-out and develop key pieces of digital infrastructure.

This will help enhance the activities of sporting organisations, education providers, the agricultural sector and community enterprises. In an effort to reverse rural decline fibre broadband connectivity is to be made available in rural schools as part of the Digital Strategy for Schools 2015-2020. That school's strategy recognises the important role that cloud computing could play in schools and the need for schools to receive support and advice on new trends as well as access to technical support.

The Council will also investigate opportunities to leverages supports at the national and European level to help provide improved infrastructure. For instance, the WiFi4EU initiative promotes free access to Wi-Fi connectivity for citizens in public spaces including parks, squares, public buildings, libraries, health centres and museums in Municipal Districts throughout Europe, allowing local authorities to apply for vouchers to the value of €15,000 for the provision and installation of related infrastructure.

4.3.1 Strategic Objectives

- **Work with NBP contractor & private operators to expedite roll out in Waterford**
- **Support communities to maximise use of Broadband connection points(BCP's) and Digital Hubs.**
- **Work with other State agencies to co-ordinate aspects of their Digital Strategies for the benefit of citizen and communities across Waterford**
- **Continue to support and provide public Wi-Fi where feasible**
- **Support the use of smart applications in Waterford**



4.3.2 Waterford Case Study

Dunhill Ecopark and Business Innovation Centre

Rural Waterford faces infrastructure challenges such as average broadband connectivity. While this remains a priority of the National Broadband Plan, the rollout by commercial operators is bringing connectivity to the Dunhill Ecocentre. The centre is served by a dedicated high-speed broadband connection. Dunhill Eco Park primarily services food clients and is growing a reputation as a hub for start-up and micro food enterprises.

“Dunhill Rural Enterprises Ltd is thrilled with its supply of fibre broadband from Eir in 2019. It will make a significant difference to our capacity in a rural community to attract in new business to our enterprise centre and transform the operations of current enterprises. Fibre broadband is an essential tool in order to drive and sustain businesses in rural communities. We are now on the road to long term viability and sustainability having acquired this critical tool”.

Dr Senan Cooke, Secretary, Dunhill Ecopark

4.4 Digital Council

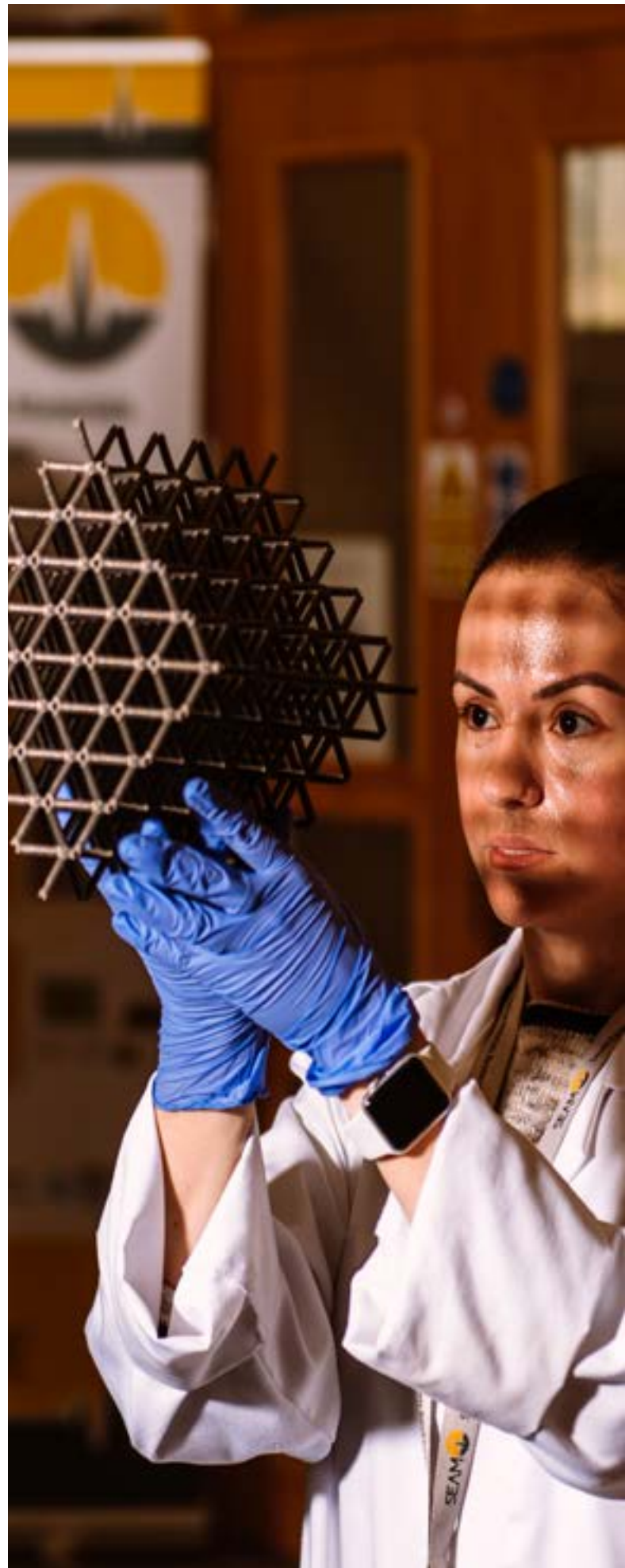
Across the last decade many traditional services have been transformed, with the introduction of digital front-end process, self-service portals and digitalised operational activities making processes more accessible and more efficient more users.

More recently the COVID-19 crisis has highlighted the importance of accessibility and continuation of services through online platforms while social distancing measures are in place.

This is particularly true of governmental activities, upon which residents depend on for housing and welfare assistance, planning and other everyday public services. To keep pace with such changes and ensure the quality and accessibility of public services there is a need for local governments to adopt new digital solutions in the delivery of their functions.

Under the Waterford Digital Strategy Waterford City and County Council will continue to expand its digital services offering to the public, utilising new technologies to improve efficiency, cost-effectiveness, and security. The Council will continue to undertake work to develop high quality data sets and build the capacity to public open data in a manner that is accessible to residents and enterprises.

A focus on business intelligence and analytics will help streamline council activities and services and the Council will maximise opportunities and learnings arising from Our Public Service 2020 and other public sector initiatives to enhance service delivery.



4.4.1 Strategic Objectives

- **Develop an ICT Strategy to underpin the Council's Corporate Plan (including strategy around Open Data) and facilitate Digital Transformation**
- **As part of the Council's People Strategy, develop a Digital Skills Framework for staff to ensure ongoing training and upskilling**
- **Build a culture of Innovation within WCCC to enhance public service value and in alignment with Our Public Service 2020**
- **Work with our customers to co-design services; in conjunction with external partners explore opportunities offered by new and emerging technologies**
- **Continue to provide the public with high-quality, user friendly datasets on WCCC open data portal and promote the use of these data sets**
- **Review current citizens engagement and usage of e-government and e-governance services to determine baseline and set target**

4.4.2 Waterford Case Study

Open Libraries

With our communities, we want to create a Library Service that is part of everyone's future. We want to give our communities space to flourish and to be creative, allowing everyone to connect with and become an active part of the area in which they live. We will support our local economy through assisting job seekers, encouraging local entrepreneurs on the first steps to developing their enterprise and developing links with local businesses and business support organisations.

DIGITAL TECH SPACES

The Hub

[Wi-Fi, Interactive Screen, Projectors & Screen, 3D Printer]

Reference Room

[Wi-Fi, Interactive Screen, Projectors & Screen, Podium and Microphone]

Research Room

[Wi-Fi, Smart TV]

"By working together and further developing strong partnerships across the County with community organisations, the Library Service can play a key role in both urban and rural networks. The support and need for the Library Service are evident in our visitor numbers and other statistics.

During 2015, we have welcomed 508,900 visitors to our library branches, loaned 514,062 books, CDs, DVDs, and other items, created and hosted 2,550 events, activities, exhibitions and meetings.

We are also embracing other technologies like "My Open Library" in branches across our network which will offer extended access to customers to use the library branches outside of opening hours. Other flexible solutions like self-service issue and return of stock, new printing technology, e-books and high-speed broadband will continue to open up our services to more people and make access even easier."

Jane Cantwell, City and County Librarian

Other Digital services offered by our Libraries:

Digital Skills for Citizens Scheme

Using computer tablets

Creative Communities Club

3D Printing Workshop for teenagers

4.4.3 Good Practice Exemplars

International Case Study: New Urban Mechanics in Boston

Established in 2010, the Mayor's Office of New Urban Mechanics is an innovation incubator that is embedded within the City of Boston's municipal government. New Urban Mechanics aims to provide innovative solutions to urban issues and challenges by building partnerships between both other internal public agencies and external private organisations to pilot and implement new projects across a range of different sectors, including education, environment and public realm improvements. Though diverse, these projects have an overarching focus on the application data-driven digital solutions to address the needs of Boston's residents.

In 2013 and 2014 the City implemented the SOOFA project, installing six 'smart' benches in four public parks around Boston. This project was part of a broader effort by the City to provide greener, smarter and more pedestrian friendly public spaces. Each bench includes solar panels and a battery that people can use to charge their phone, as well as sensors that collect data on the bench's usage and the local environment. The installation of these smart benches led to unexpected positive outcomes. In addition to providing an attractive new recreational option for residents and tourists, the City found that the benches charging service was also used by members of the City's homeless population who may not otherwise have access to suitable facilities to charge their devices (<https://www.boston.gov/departments/new-urban-mechanics/soofa>).

In 2020 New Urban Mechanics piloted TreeTect, a project that aims to use high resolution satellite imagery to detect and map the location of

Boston's urban trees, as well as provide health indicators for the trees condition. This approach is considered advantageous over traditional public tree surveying works that focus only on publicly owned trees. In contrast, satellite imagery can be used to non-intrusively survey trees across public and privately owned lands, provide a more accurate picture of the city's whole tree canopy. Initially piloted in the Nubian Square neighbourhood, it is anticipated that future applications of this approach include the identification of new planting sites and the identification of problem areas where interventions are required to improve tree health (<https://newurbanmechanics.medium.com/a-year-in-reflection-2020-in-review-d2b004324a35>).

Similar to Boston's New Urban Mechanincs, the Waterford Digital Strategy has the potential to support Waterford City and County Council in delivering innovative new digital solutions.

Key Learnings and Implications for Waterford Digital Strategy

- Embedding digitisation within the municipality can help foster engagement across the public and private sectors.
- Digital tools can improve the quality and efficiency of environmental management.
- Smart tools and innovations have potential secondary impacts around social exclusion and access to services.

4.5 Waterford- Smart City

Smart Cities are those that promote and employ new technology and digital solutions to improve urban processes and achieve better outcomes for citizens. Under a smart city framework digitalisation can help improve processes across all sectors, from the employment of data-sensors to inform better transport management to the use of energy meters to improve energy efficiency. Smart cities are data-centric, using new tools to collect, communicate and employ data in the development of dedicated urban solutions. However, smart cities are also people-focused, and seek to create a safer, more inclusive, and more convenient urban environment for residents.

Waterford is a participant in The All Ireland Smart Cities Forum, a community of practice made up of city officials from both the Republic of Ireland and Northern Ireland that promotes the advancement of smart city programmes. The Waterford Digital Strategy represents an important step in the advancement of the smart city concept in Ireland and will help make Waterford a smarter, more efficient and more innovative city for the benefit of all residents.

4.5.1 Strategic Objectives

- **Work with relevant stakeholders to define what Waterford -Smart City should be**
- **Co-ordinate activities within the Council and between other stakeholders to formulate a Smart city programme of work especially in relation to NQs, WCQ and Viking Triangle**
- **Continue to participate in and learn from partners within Smart City Forum**
- **Work with SEAPJ to promote Waterford -Smart City as a driver for a Smart South East region**
- **Develop a digital dashboard to visually present and assist monitoring of KPI's**
- **Engage with Waterford LEO to determine a target and baseline on the investment in Urban and Rural digitalisation initiatives and digital enterprises**



Smart Cities are those that promote and employ new technology and digital solutions to improve urban processes and achieve better outcomes for citizens

4.5.2 Waterford Case Study

GovLabs

To develop Smart Cities as economic engines for a Smart region.

The GovLab will also enable the vision of creating

Waterford City as a smart City Laboratory or Sandbox for developing, testing and realising innovation within an urban context.



4.5.3 Good Practice Exemplars

Smart Docklands – Dublin’s Smart City Testbed



Located in the heart of the city, Dublin’s Docklands are a major centre of innovation and employment. Over 40,000 people work in the Docklands and 26,000 people live in the area. Businesses of all kinds have made the Docklands their home; financial, legal, technological, and creative, with several global corporations, choosing to locate their European Headquarters there.

The Smart Docklands District, with its density of new builds, global tech companies and range of connectivity options, provides a unique platform for SMEs and entrepreneurs to develop new and innovative solutions that can transform the way cities operate. It is a first of its kind in Ireland and globally, where Dublin City Council and academia have funded a Project Management Office (PMO) to play an ‘honest broker’ role amongst

government, the tech and start-up community, business owners, universities and research centres, and citizens of Dublin. This 'quadruple helix model' not only successfully engages collaboration between different stakeholders, but has secured strategic global partnerships with Google, IBM, AT&T, Accenture, Dense Air, Microsoft, Vodafone, Autodesk, Mastercard, Intel, and Softbank.

Smart Docklands successfully facilitates and enables the testing and trialling of smart city solutions by identifying real local challenges and working with diverse stakeholders to come up with lasting solutions in areas such as disruptive technology, environmental monitoring, waste management, and smart mobility. As a smart city testbed, Smart Docklands aims to create a platform for innovators and entrepreneurs to test a wide range of solutions in a real-life, city setting. This district is of appropriate size to trial and validate a solution before scaling city-wide and to other cities across the world. Smart Docklands showcases what can happen when a unique city district develops the level of sensor density and connectivity to make a significant jump in the quality of life for all citizens.

The Smart Docklands initiative is part of a larger smart city program known as Smart Dublin. Founded by the four Dublin local authorities, Smart Dublin aims to bring together technology providers, academia and citizens to transform public services and enhance quality of life. Similar to Smart Docklands, a dedicated Smart Dublin City team supports a wide range of 'smart' initiatives including future connectivity and mobility projects, environmental initiatives, policy development and citizen engagement activities, with an emphasis on collaboration between all stakeholders in order to achieve the aims

of providing greater quality of life and service through smart technologies.

Key Learnings

- Defining both a physical and digital space for the testing of new and innovative digital solutions can both attract investment and engagement from stakeholders towards developing communities, towns and cities in an ever-growing digital age
- Utilising technology to enable dynamic collaboration with multiple parties and partnerships such as the quadruple helix model described within the Smart Dublin and Smart Docklands programs
- Adopting smart city concepts can provide transparency in decision making across agencies and communities when using smart data

4.5.3 Good Practice Exemplars

International Case Study: Public / Private Partnerships for Digital Solutions in Amsterdam

Amsterdam's approach to creating a smarter urban environment has focussed on supporting engagement and collaboration across different sectors to achieve greater innovation and efficiencies. Established in 2009, Amsterdam Smart City (ASC) is a public/private partnership between municipal stakeholders and commercial enterprises and research organisations. ASC is an open innovation platform that represents a shift from restrictive, siloed governance models to capitalise on the agility of local partnerships to tackle contemporary urban issues.

The ASC platform promotes new urban projects and innovations by providing a space in which stakeholders across all sectors can share and access information. Enterprises and organisations, as well as individual residents can join the platform as members, where they can share and promote new ideas and seek guidance and funding for new projects. To date the SCI has approximately 8,000 members and has supported over 80 projects across the city, ranging in focus from smart mobility patterns (<https://amsterdamsmartcity.com/about>). Transparent and shareable data is a central element of the platform. Both public and private bodies are able to upload and share data which users then pull from to inform and develop new tools and projects/

These projects are diverse and range in focus from improving mobility and travel patterns to supporting climate change action and energy efficiency. For example, the City now uses GPS

data made available from a local navigating software provider to manage traffic flow, allowing for the changing of traffic lights in alignment with real-time travel peaks (<https://digital.hbs.edu/platform-digit/submission/amsterdam-smart-city-asc/>).

In terms of climate action the Climate Street pilot initiative sought to demonstrate how smart solutions can help improve energy efficiency and reduce emissions in busy urban centres. Working with 40 commercial businesses in the busy Utrechtsestraat area to implement smart energy meters, street lighting that reacts to the presence of pedestrian, solar-powered waste-collections vehicles and other smart tools and measures, the Climate Street pilot resulted in collective annual energy cost savings of \$65,000 and emission reductions of 172,922 kilograms of carbon dioxide (<https://apolitical.co/solution-articles/en/amsterdam-showcases-high-tech-low-energy-street-future>).

The success of the ASC in fostering collaboration between different public and private stakeholders provides an indication of how such partnerships can help deliver innovative solutions, particularly around climate action objectives contained in the Waterford Digital Strategy.

International Case Study: Public / Private Partnerships for Digital Solutions in Amsterdam (cont.)

Key Learnings and Implications for Waterford Digital Strategy

- The utility of accessible data from a range of different sources to support new tools and projects
- The importance of fostering public/private partnerships to support innovative new digital solutions
- The potential for digitisation to contribute to energy efficiency and reductions in climate change related emissions



4.6 Climate Action

Digital and smart technologies are helping to foster a world which is becoming increasingly connected. Despite this, our planet is still facing significant pressures on its natural ecosystems, environments and climate. With increasing pressures on our cities and settlements to adapt to and mitigate the effects associated with climate change, leveraging our ever-growing digital capacities towards this aim has never been greater.

With the recently enacted Climate Action Bill comes a new commitment to increasing biodiversity, creating a climate resilient society and becoming a climate neutral economy by 2050. Digital technologies could be the most powerful influencer to accelerate global and national climate action.

In this context, Waterford can become an exemplar of appropriate and successful climate action through its adoption of climate action as a key strategic objective within our digital strategy.

Within this strategic objective, actions spanning from transport to building stock, community engagement to international collaboration have been outlined as some of the many potential actions towards creating healthy synergies between the growth of Waterford, it's digital capabilities and the health of its urban and natural environments.

4.6.1 Strategic Objectives

- **Develop strategies and social platforms to engage with communities and increase awareness of the need to reduce greenhouse gas emissions**
- **Exchange experiences with other cities to identify innovative solutions for carbon reduction that could be replicated in Waterford**
- **Lead the evolution of smart transport, delivering better public transport, less traffic congestion and lower emissions in Waterford city and county**
- **Support the retrofitting of smart technologies such as smart sensors, meters and RES integration in council buildings to help reduce carbon emissions.**
- **Support the integration of smart public lighting across Waterford**

4.6.2 Good Practice Exemplars

iSCAPE: Improving the Smart Control of Air Pollution in Europe



The iSCAPE project was a European research and innovation project active from September 2016 to December 2019 that worked on integrating and advancing the control of air quality and carbon emissions in European cities in the context of climate change through the development of sustainable and passive air pollution remediation strategies, policy interventions and behavioural change initiatives.

It tackled the problem of reducing air pollution impacts, focusing on the use of “Passive Control Systems” in urban spaces, on policy intervention and behavioural changes of citizens lifestyle. iSCAPE encapsulated the concept of “smart cities” by promoting the use of low-cost sensors and engaging citizens in the use of alternative solution processes to environmental problems. The project supported sustainable urban development by sharing the results with policymakers and planners using local test-cases and providing scientific evidence ready-to-use solutions potentially leading to real-time operational interventions. Through the approach of Living Labs, the team deployed a network of air quality and meteorological sensors (both stationary and mobile) and evaluated the benefits expected from these interventions on

a neighbourhood and city-wide scale, ranging from quantification of pollutant concentration to exposure.

The iSCAPE project closing event that took place on the 8th of November 2019, presented the key results on air pollution control and monitoring developed through the project. The event saw the participation of professionals, policy-makers, and researchers, allowed project partners to present the results of three years of research and hands-on experience in reducing urban air pollution, and the negative impacts of climate change, through passive control systems, citizen engagement, behavioural change, and the low-cost sensors developed through the project.

Key Learnings

- Investment and research in low-cost smart technology such as sensors can reduce the future social and monetary costs of climate change on our communities
- Sharing data and research with other countries, institutions and municipalities through digitally-backed collaborative projects can provide new learnings, technologies and literacy in technology-based climate action

4.6.3 Case Study

OPERANDUM: The Open Air Laboratory and Flooding in Dublin



One of the biggest climate related issues Dublin is facing is flooding. Climate change has already caused a major increase in extreme rainfall and as a coastal region, the city faces further flooding risks due to rising sea levels. More extreme weather events are occurring in shorter spaces of time, leading to pressure being put on existing flood prevention measures, such as gullies and storm drains.

In tackling this, Dublin City Council in conjunction with University College Dublin has set up an Open Air Laboratory in Dublin as part of the wider European and international initiative OPERANDUM, which aims to find nature-based solutions to human-induced climate change around the world.

The Open Air Laboratory in Dublin is in Ringsend, close to the River Dodder and its catchment area, with the river passing through an extensive number of residential, urban and commercial areas, most notably in the South Docklands area of Dublin City Centre. The aim in the Dublin Open Air Laboratory is to work with citizens to co-develop nature-based solutions to help alleviate

the effects of increased flooding in the city. The development of smart models that simulate climate change projections will aid in predicting the impact of the proposed solutions on Dublin City and on Dublin City Council's flooding operations.

Research trials in recent years have seen over one hundred sensors deployed in Dublin. Building on this work, OPERANDUM researchers are seeking to identify technologies that could support the creation of a denser, more reliable and lower cost sensor network for the city. This involves publishing data sets previously generated by low-cost sensor trials on Dublinked, Dublin's open data platform, and understanding the use of LPWAN (low-power wide-area network) for environmental sensing.

OPERANDUM is also working alongside residents for support in collecting the necessary local data to develop nature-based solutions for the area. A 'citizen science' workstream is currently underway, which will give citizens the opportunity to co-monitor the types of weather events that lead to flooding incidents. This citizen-generated data will again be made available on Dublinked, increasing

the amount of open data available for further climate research.

Green infrastructure is also an area of focus within the Open Air Laboratory which leverages open data and citizen engagement. Based on community insights and recommendations, construction has begun on a green roof on top of the CHQ building in Dublin's Docklands, in partnership with Dogpatch Labs. The data gathered from this green roof will allow for a predictive model to be built to assess the potential impact of this intervention in current and future climates.

Together these tools allow researchers to determine where the main gaps are in the current sensor network and identify the most suitable locations for new installations to monitor more of Dublin's rainfall and water levels, which are key to building an ecosystem approach to flood warning systems and flooding. To date, the project team have identified geographical gaps in 14 locations

across Dublin and partnered with an Irish IoT company, ZiggyTec, to deploy rainfall sensors on the Sigfox LPWAN network.

Key Learnings

- Building digital literacy through workshops and co-developed programs can increase participation, engagement and innovation among citizens to improving the quality of life in communities through locally attuned solutions
- Leveraging technology and digital tools to model areas at risk of climate events such as flooding can aid in improving the viability of regions, cities and localities as candidates for future investment, economic activity and innovation

MONITORING AND EVALUATION OF THE DIGITAL STRATEGY OBJECTIVES



5. MONITORING AND EVALUATION OF THE DIGITAL STRATEGY OBJECTIVES

This section describes the process of monitoring and evaluation of the Digital Strategy's key Strategic Objectives, which aims to measure the progress towards targeted objective results.

5.1 Defining Monitoring and Evaluation

Monitoring and Evaluation (M&E) are applied processes that allow for the assessment of projects and interventions. Assessment is conducted to ascertain whether the implementation of certain project interventions is having the intended results. It also assists in the review of projects and interventions to highlight if something can be done differently to achieve the prescribed goals and objectives.

M&E can be defined as the following (European Commission, 2018):

M

Monitoring uses systematic collection of data on specified indicators to provide the management and the main stakeholders of an on-going intervention with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds

E

Systematic and objective assessment of ongoing or completed interventions (actions/policies), their design, implementation and results according to the following criteria: relevance, effectiveness, efficiency, sustainability, impact, coherence and added value

In terms of the Waterford Digital Strategy, M&E aims to assess the implementation, progress, results, and sustained improvement in the digitalisation initiatives the Strategy proposes. Using M&E as a tool, either formally or informally, allows the Council to keep track of the progress and success of interventions and report such progress to all public and private stakeholders, but is also used as a means of understanding when, where and why interventions are successful or unsuccessful and to highlight when further intervention is required.

5.2 The M&E Framework

The following subsections provides an overview of the M&E process and the setup of a KPI framework

for the M&E of the Strategy's objectives.

5.2.1 Results-based M&E Approach

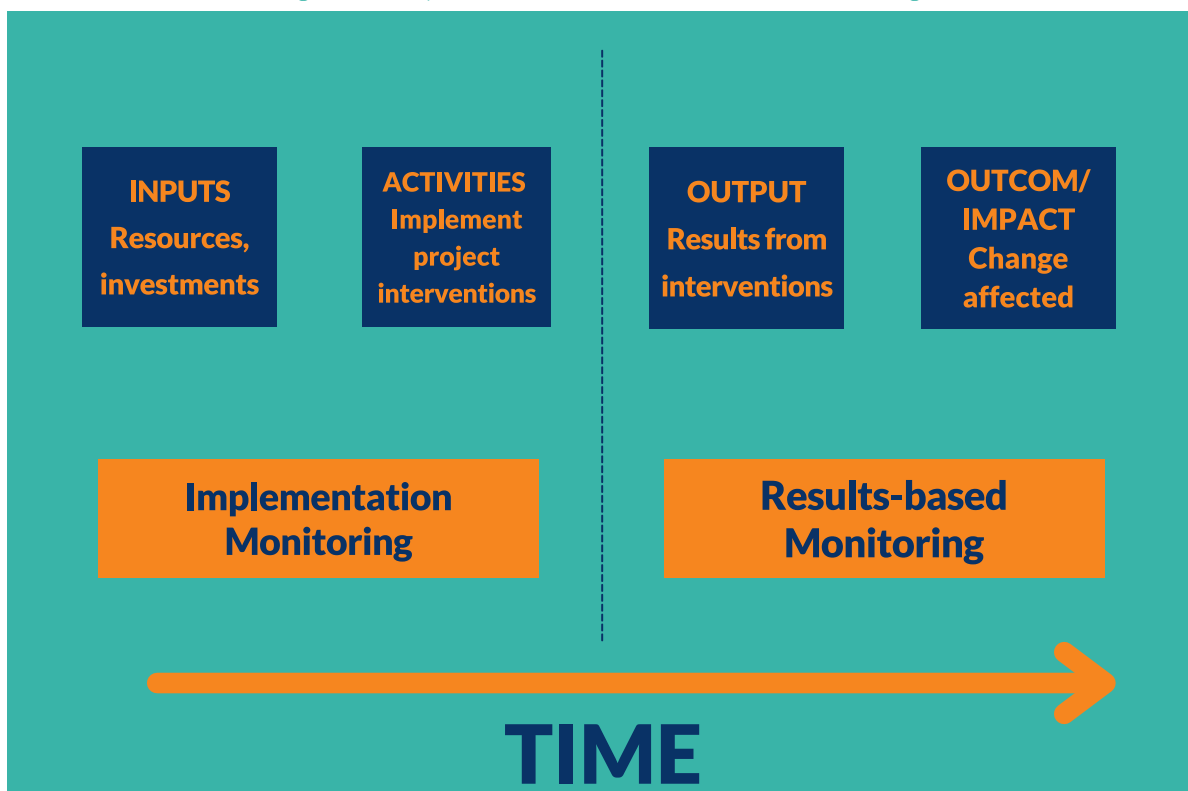
For this Strategy, a results-based M&E approach has been developed, which places specific emphasis on the outcomes and impact of interventions implemented through the Strategy.

A results-based approach emphasises that focus is not only placed on the delivery of outputs within a set time and budget, but more so on providing evidence that the results, contributions, and impacts are achieved as planned. A results-based approach is particularly useful in a process-orientated strategy and practically applicable for public sector programmes and policy interventions which apply a flexible approach to implementation, and where most suitable interventions are

planned according to the ongoing development of needs.

The results-based approach comprises of two main components, implementation monitoring and results-based monitoring. Implementation monitoring is focused on the implementation and overall performance of interventions, while results-based monitoring focuses on the impacts and outcomes as the interventions progress overtime. The following figure provides an overview of the relationship between implementation and results-based monitoring.

Figure 51: Implementation and Results-based Monitoring



As seen in Figure 51, results-based monitoring goes beyond implementation monitoring as it observes what impacts the implemented interventions are having ‘on the ground’.

To implement the results-based monitoring approach, a stepped process is set out in Table 51.

Table 51: Monitoring Process using the Results-based Approach

<p>1. Inventory</p> <p>Assessment of the existing digitalisation initiatives and interventions that are ongoing and how they can be incorporated in the strategy and M&E framework</p>	<p>2. What to Monitor</p> <p>Identification of initiatives and interventions that are to be monitored, with subsequent development of relevant KPIs. Verification of standards to be used in the assessment, defining the scope for all KPIs</p>	<p>3. Baseline Data</p> <p>Definition and confirmation of the descriptions of all indicators, recording the baseline (starting point) to which measured data will be compared following intervention implementation</p>
<p>4. Monitoring System</p> <p>Preparation of data monitoring, capturing, and management processes. Defining calculations for the measurement and comparison of all KPIs. Defining reporting and data sharing formats</p>	<p>5. Project Data Gathering</p> <p>Defining of data capturing process – involved parties / stakeholders, data gathering principles, frequency, granularity. Setup of data storage and processing principles to ensure accurate, efficient and consistent data capturing</p>	<p>6. Analysis and Reporting of Monitoring Information</p> <p>Defining the format in which measured data and M&E results are to be reported. Setting out data sharing process and engagement with key stakeholders and decision makers. Making sure that data and information is set out simply, conducive to quick understanding</p>
<p>7. Quality Verification</p> <p>Ensuring that the data, information and M&E results provided are accurate, useful, timely, relevant, and verified</p>	<p>8. Use of Data</p> <p>Use of data, information and M&E results in the derivation of key insights, guidelines, recommendations, and planning of further Strategy interventions</p>	<p>9. Reflection and Evaluation</p> <p>Objective evaluation of interventions and initiatives, using quantitative and qualitative data and information gathered to determine if interventions have been successful, and what lessons have been learned that can be applied to Strategic objectives or initiatives going forward</p>

5.2.2 KPI Framework

The process of M&E is standardised using a KPI Framework specifically developed to measure and evaluate the performance and success of interventions applied through this Strategy.

The framework uses a set of predefined indicators categorised across the following themes as seen in Table 52.

Table 52: KPI Framework Themes

#	THEME	DESCRIPTION
1	Digital Economy	Measurement of the impact that digital interventions are having on the economy, through related aspects such as income, employment, and ... Measurement of the level of investment in digital objectives, initiatives, and interventions by public and/or private stakeholders
2	Citizens & Community	Measurement of the impact that digital initiatives and objectives are having on citizens, communities, and community stakeholders. Measurement of the level of accessibility of digital initiatives, hardware, software, and training to the users thereof
3	Digital Infrastructure	Measurement of the level (overall development and/or number of assets) of infrastructure development that enables digitalization and connectivity
4	Digital Council	Measurement of the Council's progression in the use and development of digital technologies.
5	Smart Waterford	Measurement of the level of smart technology use and deployment in Waterford City and County to facilitate and improve access to and the use of smart data in the improvement of service delivery
6	Climate Action	Measurement of the impact that digitalization initiatives are having on the reduction in the disposal of harmful waste that contribute to the destruction of the natural environment and global warming. Also includes the measurement of the use of carbon neutral assets such as RES

The description of each KPI sets out the factors to be measured, as well as the frequency and level of reporting. Each KPI has a defined calculation methodology with relevant parameters that determine its measurement over the lifetime of the Strategy, which ensures consistency and accuracy in the evaluation of interventions.

The KPI framework is further expanded to provide a set of relevant indicators under each theme, that measures and tracks the progress and performance of interventions aiming to achieve set goals in each of the Strategy's key Themes. See Table 53 below for a breakdown of the KPIs across each theme.

Table 53: KPI Framework

THEME	DESCRIPTION	KPI #	KEY PERFORMANCE INDICATOR
Digital Economy	Measurement of the impact that digital interventions are having on the economy, through related aspects such as income, and employment	1	Number of Digital Hubs established and usage / occupancy (%)
		2	Development of a rural strategy that includes 'Digital' objectives
	Measurement of the level of investment in digital objectives, initiatives, and interventions by public and/or private stakeholders	3	Number of SMEs that have received training on Digitalization opportunities / benefits
Citizens & Community	Measurement of the impact that digital initiatives and objectives are having on citizens, communities, and community stakeholders.	4	Usage/ uptake of digital technology offerings and supports in libraries in Waterford
		5	Increase in public participation through digital technologies (%)
	Measurement of the level of accessibility of digital initiatives, hardware, software, and training to the users thereof.	6	Number of Digital Champions trained and annual funding for training
Digital Infrastructure	Measurement of the level (overall development and/or number of assets) of infrastructure development that enables digitalization and connectivity.	7	Percentage of properties (residential, Commercial, Industrial) with access to broadband Internet connectivity
		8	Number of social / public digital infrastructure assets / facilities (e.g. smart benches/lampposts, free Wi-Fi zones, etc.) and number of smart applications operational

Table 53: KPI Framework (cont.)

THEME	DESCRIPTION	KPI #	KEY PERFORMANCE INDICATOR
Digital Council	Measurement of the Council's progression in the use and development of digital technologies	9	Increase citizens' engagement and usage of e-government and e-governance services (%)
		10	Number of high-quality, user-friendly datasets available on WCCC open data portal and increase in use (%)
		11	Development of the Council's ICT Strategy (incl. Open Data policies)
		12	Number of Council staff upskilled/trained in the use of digital technologies
Smart Waterford	Measurement of the level of smart technology use and deployment in Waterford City and County to facilitate and improve access to and the use of smart data in the improvement of service delivery	13	Investment in urban and rural digitalisation initiatives and digital enterprises
		14	Creation of a digital dashboard to visually present and assist monitoring of KPI's
Climate Action	Measurement of the impact that digitalization initiatives are having on the reduction in the disposal of harmful waste that contribute to the destruction of the natural environment and global warming. Also includes the measurement of the use of carbon neutral assets such as RES	15	Increase in public transport and WCCC fleet which are EV's/hybrid (%)
		16	Number of charging infrastructure for electric vehicles in public parking facilities and WCCC vehicles
		17	Increase in the integration of smart technologies in buildings (smart sensors, meters and RES integration) and integration of smart public lighting

5.2.3 Data requirements, Quality and Quantity

To make sure that data and information collected for the M&E process are of the right type, quality, and quantity it is important that data is measured as close to the source of the intervention as possible. This means that data or information should be captured at the level at

which an intervention is implemented. Capturing data at this level ensures that detailed data and information is considered in the assessment and evaluation of the intervention, and that characteristics of the interventions are not lost in the aggregation of data.



5.2.4 Measuring Change Over Time

Timeframe and Reporting Periods

The timeframe of the proposed M&E framework is initially set for the lifetime of this Digital Strategy (2022-2026), although it can be used to monitor the progress of relevant longer-term indicators after the lifetime of the plan. This will ensure consistency of data collection processes, tracking of progress and performance, and the reporting of results.

Setting the Baseline

To measure the effectiveness of interventions it is important that both input and output value is considered. Input value (or baseline) refers to the measured current performance of infrastructure or facilities related to the digital landscape in Waterford, while the output value refers to the

measured performance of the infrastructure and facilities following the implementation of interventions. The capturing of accurate baseline data enables the comparison and benchmarking of measured performance of newly implemented interventions, showing the real impact that these are having at the scale that they are implemented.

Expected Impacts and Targets

To ensure interventions outputs are maximised, it is important to set expected impacts and targets to work towards. This is an important indicator into whether a intervention has underperformed or exceeded expectations. Any impacts or targets set should be realistic and achievable. An expected impact should be what effect the intervention, if successful, will have and what could come from it while a target should be a set goal that is either achieved or not.



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