SLIGO
COUNTY COUNCIL
COMHAIRLE CHONTAE SHLIGIGH

Digital Strategy for Sligo 2020 - 2023

Embracing digital innovation to make the region a better place to live, work, visit and do business.

September 2020
Public version 1.0

EXECUTIVE SUMMARY

1.1 Introduction

The leadership team in Sligo has the objective to embrace digital innovation in order to showcase what is possible in a rural city on Europe's western seaboard. The region is characterised by having a rich cultural heritage, centred on the 25,000 urban residents in the main city, plus 90,000 in the wider region.

Sligo, classified as a transition region[1] by the European Commission from 2020[2], has already stated its vision[1] of being a leading Smart City and Region by 2025. This Digital Strategy is key to both accelerating the transition and enabling the vision.

Furthermore, Sligo's leadership is committed to strategically investing resources to support research, innovation and skills development. It also aims to help create and foster a healthy and vibrant environment for entrepreneurship to flourish[3].

The starting point for this strategy are the many Digital-related activities, innovations and developments underway, that provide excellent foundational examples.

This Digital Strategy has to look forward but also to look at the current situation the region finds itself in. The Covid-19 pandemic has put severe challenges on society and business. Work practice and lifestyles have had to change and some of these will be with us well into the future.

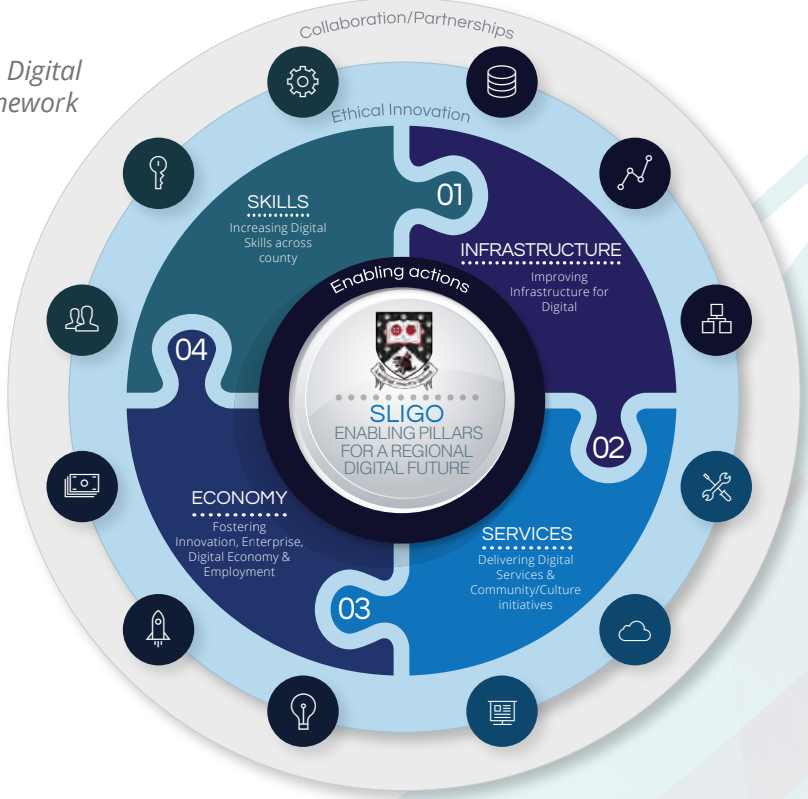


Figure 1 Sligo Digital Strategy Framework

[1] *Transition region is where GDP per inhabitant was between 75 % and 90 % of the EU average. (https://ec.europa.eu/eurostat/web/regions/background)*
[2] *https://ec.europa.eu/eurostat/web/regions/background - transition regions (where GDP per inhabitant was between 75 % and 90 % of the EU average)*
[3] *Sligo County Council (2016). County Sligo Local Economic and Community Plan (LECP) 2016-2021, Sligo.*

This is not just for Sligo, but for the whole of Western Europe. These changes have been reflected in increased digital reliance as well as new digital instrumentation.

A new digital landscape is emerging, online meetings (for both family and business) have increased rapidly, others like e-businesses are expanding, home shopping and home delivery of food/goods is growing, and new technologies such as track and trace have appeared.

Having a flexible Digital Strategy is essential for Sligo, it not only has to reflect existing requirements, but also accept that many of these may evolve requiring increased or new processes and technologies to be adopted. This strategy provides an inclusive yet considered approach to shaping the future Digital Society across the region as well as creating the foundations to design a better Smart and Green economy that can endure and prosper economically.

1.1.1 Digital Vision

Following the launch of this strategy document, Sligo County Council intends to accelerate its digital vision. In the process, it will create an environment that supports innovation, collaboration and investment for residents, visitors and businesses.

The primary vision of this digital strategy is to place County Sligo at the forefront of a digital transition. In doing so it will also:

i. Support the climate action agenda,

ii. Promote increased economic activity in the region and within the city centre, and,

iii. Deliver improved social inclusion.

It is important to recognise that this vision must also be flexible to adjust in the context of an evolving national and international landscape.

1.1.2 Digital Objectives

To place Sligo at the forefront of digital innovation, a series of short to medium term objectives have been developed for the life of this strategy.

1. Accelerate the deployment of digital infrastructure to enable Sligo achieve its Smart City Sligo 2025 ambitions,

2. Activate a rich ecosystem of public, private, academic and civic partners in a collaborative process to make the digital vision an enduring reality,

3. Establish an appropriate governance structure to manage the ongoing digital initiatives and deliver value to all stakeholders.

In particular, the actions driving these objectives are to:

- Create and promote energy efficient streets, neighbourhoods and urban centres,
- Develop policies around smart transport, delivering better public transport, less traffic congestion and lower emissions,
- Build evidence-based decision-making capabilities using sensor data streams,

- Make all public realm assets, such as benches, street poles, bus shelters etc., available to enable accelerated digital innovation as well as installing sensors, Internet of Things assets, Wi-Fi and other technologies where appropriate,

- Exploit the capabilities of data and analytics to improve aspects of the city and its environs. This can include, better environmental information on water, traffic congestion, anti-social behaviour, planning decisions, etc.

- Present the Region as a 'Living Lab' that will collaborate with leading edge national and international organisations for testing, developing and scaling applications such as in e-health, tourism and IoT solutions,

- Support an ecosystem of collaboration that includes, public, private, academic and civic partners.

1.1.3 Strategic Pillars

In a recent digital readiness assessment by Indecon[2], commissioned by the Department of Rural and Community Development at a national level, 7 thematic pillars are set out to develop a comprehensive digital strategy.

To create a meaningful and manageable plan for the next 3 years, these 7 thematic pillars have been combined into 4 strategic pillars for Sligo.

Sligo Digital Strategic Pillars: 2020-2023
1. Increasing Digital Skills across the county
2. Improving Digital Infrastructure
3. Delivering Digital Services & Community/Culture initiatives
4. Fostering Innovation, Enterprise, Digital Economy & Employment

Table 1 Strategic Pillars

1. Increasing Digital Skills across the county. Championing inclusion and lifelong learning to ensure the businesses and communities, especially vulnerable people, are digitally skilled, confident and literate.

2. Improving Digital Infrastructure. Providing the infrastructure needed to ensure the regions are better connected and hence informed.

3. Delivering Digital Services & Community/Culture initiatives. Creating people-centred programs and services using technology to be both more responsive to the needs of the communities. Engaging with citizens and communities through using technology to transform how people engage with public services, and interact with each other.

4. Fostering Innovation, Enterprise, Digital Economy & Employment. Creating the collaborative environment to foster innovation and entrepreneurship. This can be between the public, academia, business and community actors.

Sligo's digital transformation is centred around these four strategic pillars and in line with international best practice, will be supported through collaboration, partnerships, and underpinned by ethical innovation.

1.1.4 Collaborative Innovation Approach

Sligo is proposing an innovative approach to delivering on this strategy by embracing a new paradigm using Open Innovation 2.0[3] (OI2). This approach is based on a Quadruple Helix Model where government, industry, academia and civil participants work together to co-create and drive structural changes far beyond the scope of what any one organisation or person could do alone[4].

The outcomes of this strategy will accelerate digital innovation between 2020 and 2023. This in turn will form a core component of the regional 2030 development strategy that has already commenced. It is expected that the next Digital Strategy 2023-2026 will build further on this again using the Quadruple Helix Model for co-creation and collaboration.

1.2 What is currently underway

County Sligo has many initiatives underway that provide solid foundations to support this strategy. Continuing to develop these initiatives along with the ambition of the Council, provides a unifying framework to enable Sligo to become a leading Digital and Smart Region nationally and internationally.

A selection of these are presented here as they relate to the 4 strategic pillars,

1.2.1 Pillar 1: Increasing Digital Skills across the county

Various initiatives are underway that increase the level of digital skills across the region, including:

1. The Local Enterprise office and Sligo Chamber Skillnet provides a range of offerings from IT Skills, Social Media, Mentoring & Management development up to QQI accredited business development, leadership & management programmes.

2. The North West Regional Skills Forum (NWRSF) helps ensure the skills needs of business are met, supporting job creation, sustainability of business and the availability of talent.

3. IT Sligo Employment Services provides online bespoke work based learning programmes for companies in the region.

4. IT Sligo has a range of National Qualification Framework (NQF) Level 6,7 & 8 courses available on digital technologies, AI, ML and Data Analytics.

5. St Angela's College provides a range of Health and Education courses, with graduates at NQF Level 7, 8 & 9.

6. Mayo, Sligo and Leitrim Education and Training Board provides a wide range of further education and training programmes across the region.

1.2.2 Pillar 2: Improving Digital Infrastructure

Sligo have a number of initiatives underway in this area, these include:

1. Developing co-working hubs such as An Chroi in Tubbercurry and The Landing Space in Sligo city.

   https://www.idaireland.com/how-we-help/landingspace

2. Upgrading public buildings, such as the Tubbercurry Community Library, to be a digital resource and service centre, and accessible to the public outside of core opening hours.

   https://sligolibrary.ie/tubbercurry-community-library/

3. Innovating with sensors, such as the trial using Photocells on street lights, to collect data that can be used to inform evidence based decision making. This data provides valuable information to understand the impact of various initiatives or policy decisions.

   Figure 3 shows the reduction in people in Sligo City centre at various dates during the COVID-19 pandemic and the level of compliance for public policies.

Figure 2 The Landing Space Co-working location

Figure 3 Sligo City centre visitors during COVID-19

4. The council has adopted a policy to include at design stage, the provision for digital infrastructure in all major capital projects. Examples include:

For all roads and other infrastructure projects, shared ducting is included that allows fibre to be easily installed without any further construction works.

Figure 4 Shared Infrastructure being installed in O'Connell Street

Figure 5 O'Connell Street Shared Infrastructure Map

Currently this is in place on the O'Connell Street redevelopment project, the Western distributor road and the planned Cranmore Regeneration project.

Figure 6 Stephens Street Cultural Plaza

5. Various other SMART initiatives are also committed to:

    - Ensuring there is a SMART Connected component to all new public realm developments.

      This example is the new development of the Stephens Street Cultural Plaza, where Smart Utility poles are being installed.

    - Leading an innovation initiative using Wi-Fi and Bluetooth within existing infrastructure such as streetlights and electricity poles, that aims to derive analytics of usage of urban spaces.

      It can also provide push messaging information to visitors on the 'EuroVelo 1- Atlantic Coast Route'[4], as it runs along the west coast of Ireland on its route from northern Scandinavia to the southern end of Portugal.

Figure 7 Smart Utility Poles in Stephens Street Plaza

6. Upgrading the N4/N15 roadways to use traffic signal and fibre-optic communication technology.

   This will allow real-time data to optimise traffic signal settings to road network conditions.

   Leading to reduced travel times, reduced congestion, fuel consumption and pollution.

   Enabling Emergency Vehicle green waves and the potential for public transport priority, and managing tourism congestion.

Figure 8 Additional BCP's & WiFi4EU in 60+ Rural Locations planned

Figure 9 Existing Sligo High Speed Broadband map (Q3 2019)

7. There is a significant increase in connectivity planned across the regions, predominantly in the more rural under-served areas, this includes:

   a. Broadband Connection Points (BCP's) in schools and community centres in remote areas being prepared for rural broadband installation under the National Broadband Plan.

   b. Up to 60 new locations with Wi-Fi installations under the WiFi4EU[5] scheme.

[4] *Following Europe's mighty western border, reaching from Scandinavia, to South and Western Portugal, the Atlantic Coast Route visits the majestic fjords of Norway, the wild Irish coastline, the rough cliffs of Brittany and the sun-kissed beaches of Portugal, totalling 11,000 km. https://en.eurovelo.com/ev1*

[5] *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 municipalities throughout Europe. https://ec.europa.eu/digital-single-market/en/wifi4eu-free-wi-fi-europeans*

1.2.3 Pillar 3: Delivering Digital Services & Community/Culture initiatives

Notable progress has been made over the past year on a number of initiatives supporting this pillar, including:

1. Sligo County Council already enables citizens and businesses to interact online including online payment for a range of services, and these are planned to increase during 2020.

2. Furthermore Sligo it is engaged in a number of innovative projects that are a combination of Smart, Green and Digital, these include;

    a. Energy savings around a street light refresh to low energy LED, and as mentioned earlier, combining this with using Smart photocells.

    b. Collaborating with Queens University Belfast to measure water quality and predict potential issues especially on the blue flag beaches.

    https://www.qub.ac.uk/schools/NBE/Research/ResearchCentres/qubbes/

    c. Sligo plans to adopt an open data structure that when deployed is capable of sharing data with various stakeholders, businesses and citizens.

    d. Using sensors to collect movement data that will provide an evidence base for infrastructure decision making on prioritising transport, parking, amenity usage, telecommunications, location of small cells etc.

Figure 10 Access to Digital Services

1.2.4 Pillar 4: Fostering Innovation, Enterprise, Digital Economy & Employment

The initiatives already underway in the region that help foster innovation and employment include:

1. The Council supports the establishment of co-working spaces to foster the tech start-up community and support innovation in business.

   The Council plays a role in facilitating introductions and networking, including supporting the ecosystem with government and industry bodies, such as the London-Sligo Network[6], and local industry focus groups & clusters such as the Atlantic MedTech Cluster & the Tech North West Cluster.

2. A Memorandum of Understanding with IT Sligo to work together on a range of real-world projects, research areas and new initiatives.

Figure 11 Tech North West logo

Figure 12 Atlantic MedTech Cluster Logo

3. Sligo Chamber of Commerce and the Local Enterprise Office support a program of training, workshops and seminars covering online business topics for all businesses.

4. Supporting the region with an updated brand 'Sligo.'(dot) that showcases the region as a location to 'Live, Invest and Visit' www.sligo.ie

   Within this there is also a comprehensive section outlining reasons to invest in the region as well as a catalogue of all businesses www.sligo.ie/invest/

Figure 13 Sligo(dot) Branding www.sligo.ie

[6] https://www.sligochamber.ie/evening-sligo-business-network-london/
[7] https://telecominfraproject.com/who-we-are/.

5. Digital Futures Manufacturing Centre, (DFMC) based in Sligo, serving the northwest and border regions has been funded. This centre will have a primary focus on supporting industry with developing capability in automation of manufacturing supply chain technology and creating an environment to allow companies focus on developing and implementing Industry 4.0 strategies.

Figure 14 Digital Futures Manufacturing Centre

6. **Recent initiatives**
In recent months a number of global organisations have already begun early developments and testing of new initiatives using the concept of Sligo as a living lab.

These include:

i. Sligo is now the HSE Digital Health Living Lab for older people including large global organisations such as Amazon working jointly and independently on exciting new initiatives. This innovation is a large step to support the 'Stay left, Shift left' digital health transformation strategy of the HSE and supported by Three Ireland. This has potential for the region to develop into a Remote Digital Health Management Centre of Excellence over the coming years.

ii. Global Telecom Infra Project (TIP)[7] includes hundreds of companies – from service providers and technology partners, to systems integrators and other connectivity stakeholders, driving infrastructure solutions to advance global connectivity, Sligo County Council is now a member of this community. www.telecominfraproject.com/

- Sligo and in particular Strandhill is the first rural location selected for global field trials during Q3 & Q4 2020.
- These learnings will form the knowledge basis from which a blueprint will be created that is capable of being replicated in similar regions globally.

1.3 What are the digital infrastructure requirements & needs?

Future-proof digital infrastructure remains crucial for the digital transformation of the economy[8]. During the strategic consultation process an analysis was conducted into the infrastructure needs of the various stakeholders. A gap analysis of the current infrastructure status was prepared and a summary of the plans to address these outlined.

1.3.1 Stakeholders infrastructure requirements analysis

During the consultation process all stakeholders were interviewed and their digital infrastructure needs were described. All stakeholders identified connectivity infrastructure as being by far the most important need and one which they believed the Council should have a significant role. For some broadband to the home and good 4G & 5G coverage was important, while various stakeholders had specific needs, such as town broadband and Wi-Fi in public places.

	Stakeholder needs						
Infrastructure	Individuals	Micro Business	SME's	Large Business	Education	Healthcare	Public bodies
Broadband to home	X	X	X	X	X	X	X
Town Broadband		X	X	X			X
Shared ducting in streets		X	X	X			X
Shared ducting to door	X			X			
WiFi in public places	X	X			X		
4G & 5G coverage	X	X	X	X	X	X	X

Figure 15 Stakeholder Digital Infrastructure Needs

1.3.2 Stakeholder digital Infrastructure gap analysis

The needs of the various stakeholders are clear. However, these are currently being served to different degrees. For instance, the 4G & 5G coverage, Home broadband and Town broadband appear well provided for, but they are skewed to the large population centres. Those living in or near remote and rural towns and villages remain under-served by digital infrastructure.

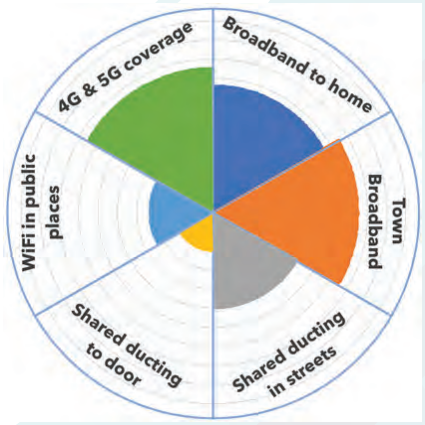


Figure 16 Stakeholder Digital Infrastructure gap analysis

[8] *European Commission (2020) Country Report Ireland 2020. "European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011" https://ec.europa.eu/info/publications/2020-european-semester-country-reports_en.*

The Wi-Fi in public places, shared ducting in streets and shared ducting to homes require much work to do to serve the stakeholder needs. However each of these areas have significant investment and expansion plans, such as up to 60 new Wi-Fi connections in public places, or have been designed into infrastructure development policies like the shared ducting for digital infrastructure which will continue to expand as general infrastructure developments occur across the region.

1.3.3 Public, Private & Non Profit Digital Barriers Survey

A recent online survey conducted among members of the public, private businesses and non-profit organisations across the region, confirmed the major digital gaps that emerged from the stakeholder consultations.

Of the 132 respondents, a significant 61% highlighted that availability of broadband was a major barrier to digital adoption within the region.

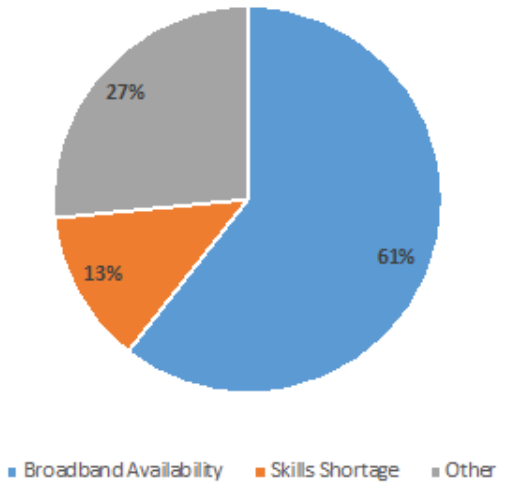


Figure 17 Digital Barriers Survey August 2020

1.3.3 Current digital infrastructure plans

Infrastructure	Current Status & Plans
Broadband to home	National broadband rollout commenced, Sligo CC actively supporting and enabling the regional deployment during 2020, 2021 and 2022
Town Broadband	Good broadband to most of Sligo Town, shared ducting will make it easy to futureproof. Other towns less well served.
Shared ducting in streets	Program underway, O'Connell St almost complete, and this is now a standard part of all new road projects from design stage.
Shared ducting to door	Planned for the new development in Cranmore. Needs to be included as part of all future housing development plans.
Wi-Fi in public places	Some public WiFi in Sligo Town, rollout of WiFi4EU to start mid 2020 to provide public WiFi in 60 additional locations.
4G & 5G coverage	Reasonable mobile coverage in significant parts of the region, however a few areas have poor or limited coverage, particularly rural areas.

Table 2 Current status of digital infrastructure

1.4 What does success look like?

All communities and stakeholders should to have access to, and confidence in, digital technology together with awareness of the benefits it can bring. Access to information, and an understanding of how to use it, will improve and enrich the lives of residents and visitors and contribute to business success.

Digital inclusion increases social and civic engagement,

- improves opportunities for business to succeed and scale,
- facilitates community development and
- contributes to the creation of employment opportunities and the economic health of the region[9].

Sligo County Council supports the government's Future Jobs for Ireland Initiative 2019[10] and commits to foster a culture supporting innovation internally with digitally-enabled workplace that offer flexible working arrangements, and nurtures its employees to upskill for the future to attract and retain the top talent.

In line with the above Future Jobs for Ireland, the Council will collaborate with business, government, academia, education providers and advocacy groups to actively participate in realising the digital future of Sligo. The council will also ensure that every future programme and investment is given consideration from a Digital, Green and Smart perspective.

Sligo's has an ambitious vision for the future.

Sligo plans to accelerate this strategy by placing the public realm assets at the core of these initiatives. All public initiatives, developments, infrastructure projects, buildings, public spaces will all be used as enablers to help achieve these ambitions.

> A future where the urban centre is a vibrant place, attracting visitors, shoppers as well as highly skilled professionals living and working in the town centre.

Currently there are many initiatives already underway (as outlined 1.1 above), these along with the suggested action plans (see Appendix I) will be further progressed and managed by the proposed new digital office ensuring a co-owned strategy where all actors work collaboratively towards a common goal.

[9] *New York City, One New York: The Plan for a Strong and Just City 2015*
[10] *Department of the Taoiseach and the Department of Business, Enterprise and Innovation, (2019). Future Jobs Ireland 2019. www.gov.ie/futurejobsireland*

1.4.1 Key Performance Indicators (KPI's)

Measuring the success of the Digital strategy needs to be based on clear measurable outcomes that contribute benefits to the region. The following Key Performance Indicators (KPI's) have been formulated to match with the strategic pillars and deliver tangible outcomes to the region.

Sligo Digital Strategy Themes - 2020-2023	Indicators 2020-2023	KPI for 2020-2023
1. Increasing Digital Skills across the county	Additional Digital Skills and Programs provided	Provide digital skills training for 500 Micro businesses and SME's in the region (or 2000 people)
2. Improving Digital Infrastructure	Building digital infrastructure into major engineering programs	Broadband to be rolled out to at least 6500 additional homes, shared ducting to be installed in 2+ km of new roads/streets.
3. Delivering Digital Services & Community/Culture initiatives	Sligo County Council developing capabilities to offer additional services online	Deliver 3 new services online and enable 3+ communtiy/culture intiatives to be launched. Increase Council/Citizen online interaction by at least 25%
4. Fostering Innovation, Enterprise, Digital Economy & Employment	Promoting the region as a second FDI location, fostering new startups or university spinouts with grants or Proof Of Concept funding, enabling small companies to work with the council.	Increased employment in the digital economy, with 20 new enterprises launched and/or 1000 new digital jobs created. Enable at least 5 local SME's/MNO's/Startups to innovate with Open Data sources provided by the Council.

Table 3 Digital Strategy 2020-2023 KPI's

1.4.2 Strategic Action Plan

To deliver the strategic objectives outlined a series of potential actions, initiatives and projects has been created. These are directly grouped around four strategic pillars. A set of enabling actions, that includes supporting collaboration and partnerships, council related actions and actions to drive ethical innovation have also been prepared. The actions plans are included in Digital Programs & Initiatives section below.

1.5 What role can the Local Authority play?

One of the most important aspects of successful deployment of any Digital strategy, is the governance model that is put in place. Sligo has a collaborative governance ambition (based upon the quadruple helix model) – where there is strong collaboration between public, private, education and civil sectors. Sligo County Council aims to take the responsibility for certain aspects and then to strengthen and formalise collaboration with other parties and also to investigate the right business model for Sligo over the coming years.

In this context, the governance model recommended combines both a technical framework and a strong leadership function;

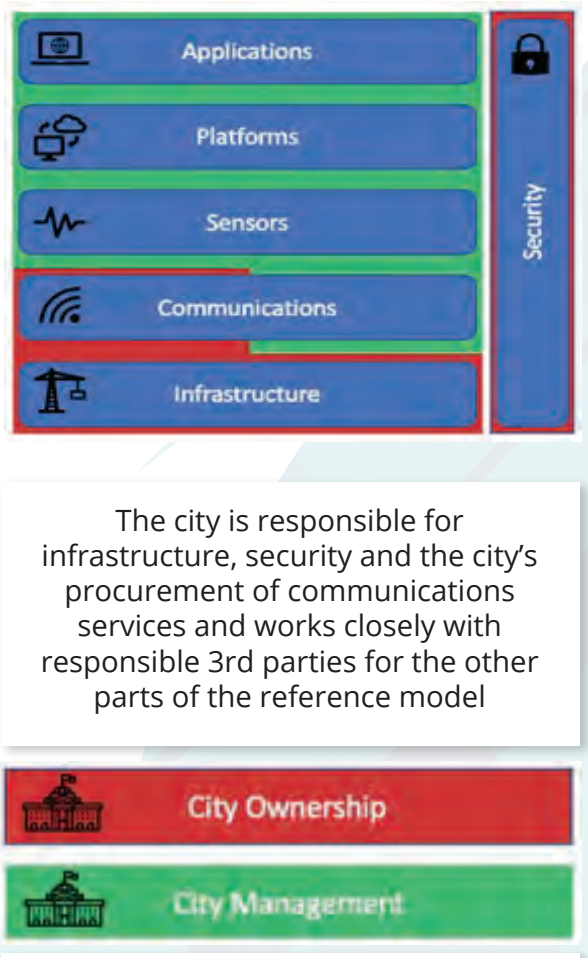
1. A Digital reference framework that extends across infrastructure, communications, sensors, platforms, applications and security layers. Within this it is vital that a Local Authority assumes responsibility for the digital infrastructure, just as it previously assumed responsibility for analogue services and infrastructures, such as roads and water networks, and ensured that they worked efficiently together.

   Beyond this, the Local Authority will need to put in place a strategic governance model that takes responsibly for key aspects of the framework as well as providing management and oversight for other aspects via a network of subcontractors and third party providers.

2. A Leadership Function that includes the establishment of a Digital Development function led by a Chief Digital Officer.

1.5.1 Reference Framework

In this proposed reference framework, Sligo County Council takes main responsibility for the layers in the reference model that are critical to providing the conditions for diversity of actors and services and thus fostering competition in order to avoid negative lock-in or interoperability problems.



The city is responsible for infrastructure, security and the city's procurement of communications services and works closely with responsible 3rd parties for the other parts of the reference model

Figure 18 Digital Reference Framework (adapted from Deloitte, 2017)

In this model Sligo will maintain ownership and control of the infrastructure layer because it enables an open and operator-neutral market model for its Smart City and Digital Initiatives and supports competition in the upper layers in the reference model.

1.5.2 Create Digital Leadership Function

Sligo needs to establish a new "Digital Development Office" . Given the strategic importance of Digital and Smart City initiatives over the coming decade, it is recommended that this office has a mandate from the CEO and strong cross functional links with the Senior Management Team.

The proposed Digital Development Office should be run by a Chief Digital Officer with responsibility for all Digital and Smart City initiatives including managing all 3rd party contracts necessary to deliver these. The type of role necessary for the Digital Development Office at each layer of the collaboration model is proposed in Section 12.3.

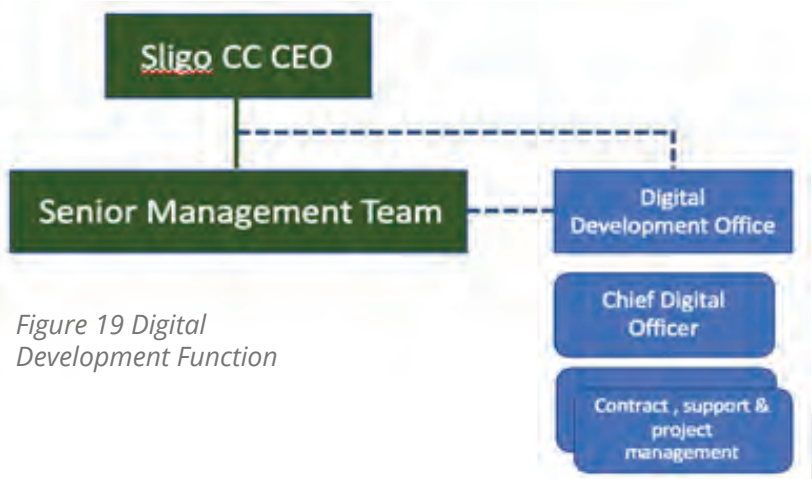


Figure 19 Digital Development Function

Reference model layer	Digital Development Office Role
Applications	Provide input on standards and specifications to enable 3rd parties to develop applications or solutions either for the authority or commercially
Platforms	Create an 'open standards' flexible data platform capable of combining multiple data sources and facilitating future application development. This is likely to be managed by the local authority and delivered by specialist by 3rd party(s)
Sensors	Set a consistent strategy & standards for sensors, including protocols, data structures, communications etc. Manage all sensor deployment by the authority, and approve all provided by external providers subject to standards
Communications	The local authority should engage a 3rd party operator to manage the communications infrastructure and help commercialise it. It is important that this is closely managed on an on-going basis. It is good practice that the provider of this service is not a provider of services at the upper levels in the reference model to minimize risk of lock-in
Infrastructure	Ownership and control of the infrastructure are vitally important to the local authority
Security	Digital office to have overall control for setting, managing and enforcing all security protocols and procedures. This is likely to be a specialist individual and/or a specialist 3rd party provider

Table 4 Digital Development Office role in collaboration reference model

1.5.3 Proposed plan for establishing governance and reference framework

Recognising these proposed models represent significant changes for the Local Authority it is recommended to adopt a phased approach. A proposed phased plan is as follows.

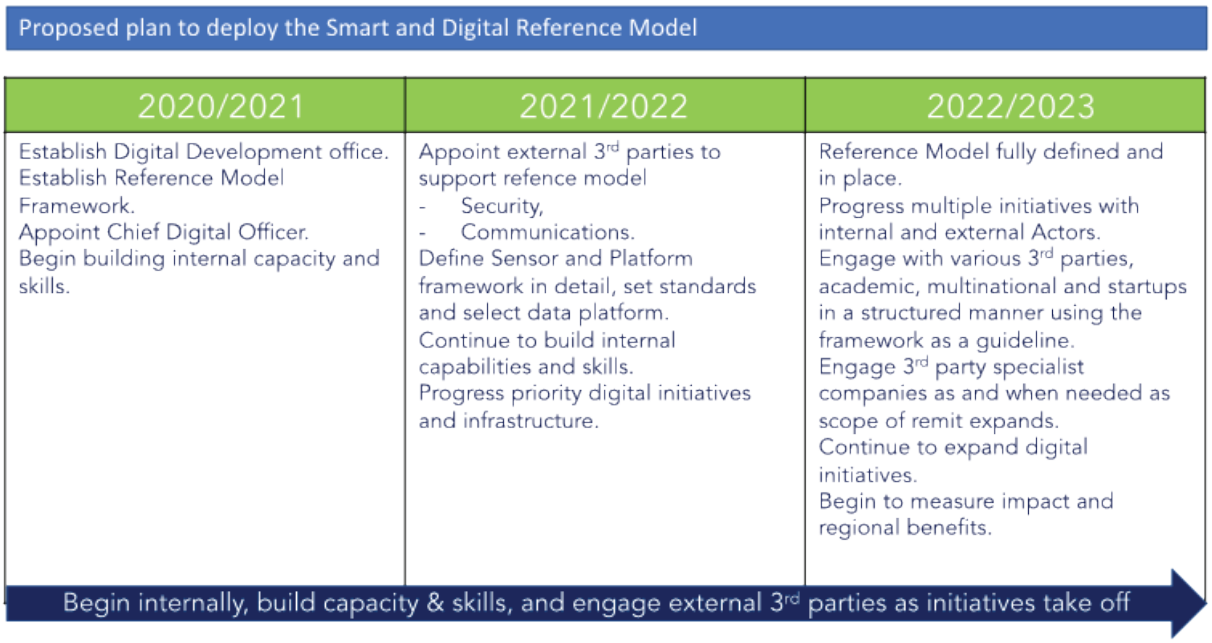


Figure 20 Proposed plan for deployment of reference model

1.6 Schedule of recommendations

Included here is a listing of the initiatives proposed in the action plan. Further details are contained within the document below and the complete action plan is included in the Digital Programs & Initiatives section below.

Recommendations	
Strategic Pillar 1: Increasing Digital Skills across county	
1	Promote & increase digital skills across the region
2	Upskilled small & family businesses
3	Provide advanced skills to local enterprises
4	Promote Sligo as an SME/Micro business Digital Leader

Recommendations	
Strategic Pillar 2: Improving Digital Infrastructure	
5	Provide digital connectivity through the County's existing neighbourhood and community spaces.
6	Encourage others to do the same, such as in shopping centres and public spaces (leisure facilities, playgrounds, event spaces etc) run by other government agencies.
7	Support the National Broadband Plan, identify infrastructure gaps in the communities for prioritisation, and proactively engage with the National Broadband Ireland (NBI) team for Sligo rollout.
8	Continue to improve access and skills through libraries and community centres, including simple things like encouraging use of online banking and services;
9	Advocate for public access to digital infrastructure in private spaces.
10	Provide digital access including Wi-Fi in public spaces.
11	Identify opportunities for digital inclusion as part of built environment projects.
12	Continue to design-in shared ducting into all capital and refurbishment projects across the region.
13	Install sensors, at every opportunity to collect data that can be used to make evidence-based decisions to deliver better services to the region.
14	Create a policy to ensure all future initiatives, projects or investments are futureproofed by always considering the Smart and Green impact in all initiatives at planning stages.
15	Become the leading Local Authority in Ireland in Data Driven & evidence-based decision making.
Strategic Pillar 3: Delivering Digital Services & Community/Culture initiatives	
16	Enable additional Council services across digital platforms
17	Embrace and Scale the Open Data Programme
18	Promote internal and external digital activity through communications and engagement tools
19	Improve digital engagement and data sharing with communities
20	Make digital the primary communication tool
21	Position the Sligo region as a leader in digital connectivity and engagement nationally
Strategic Pillar 4: Fostering Innovation, Enterprise, Digital Economy & Employment	
22	Foster partnerships with stakeholders to build on emerging and established clusters in technology, med-tech, manufacturing and data analytics;
23	Prioritise relevant, tailored and accessible support that helps business to attract and retain talent in Sligo;
24	Celebrate and promote digital success across both the start-up and broader business communities.
25	Continue to promote and support small to medium enterprises (SMEs) become digitally enabled
26	Promote the Sligo Region as a 'Digital Living Lab' for Smart & Green Innovations
27	Establish a Quick start framework for Proof of Concepts

Recommendations	
Enabling Actions 1: Ethical Innovation	
29	Position the Council as an ethical innovator in the information marketplace
30	Expand open data initiatives to benefit local communities and business and to utilise data to support evidenced based decision making and collectively plan for the future of the region
31	Build appropriate infrastructure & frameworks to manage open data & information marketplace
Enabling Actions 2: What the Council & Workforce can do	
32	Establish a Digital Development Function, run by a Chief Digital Officer
33	Adopt a reference model for Smart and Digital initiatives
34	Implement mobile & flexible workforce strategy
35	Address digital skills shortages, manage digital change: greater productivity & improved performance with similar resources
36	Ensure that Smart and Green considerations are applied to every initiative at inception and prior to completion
Enabling Actions 3: Effectively facilitate partnerships to maximise benefits	
37	Build, foster and innovate with an ecosystem of partners.

1.7 Acknowledgements

The authors would like to acknowledge the following who willingly gave their time to make a valuable contribution during the development of this strategy.

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Table 5 Stakeholders contributing to the process

SLIGO
COUNTY COUNCIL
COMHAIRLE CHONTAE SHLIGIGH

Digital Strategy for Sligo | 2020 - 2023

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SECTION 1. INTRODUCTION

Digital technology is re-shaping every aspect of our lives in ways which were inconceivable a generation ago: how we work, travel, shop, access services, meet people, communicate and are entertained. This creates both a challenge and opportunity for Sligo County Council to take a leadership position in digital transformation: creating an environment where innovation, collaboration, partnerships and investment provides an exciting future for residents, visitors and businesses.

While this digital future poses a substantial challenge, nevertheless a pattern is emerging around the world, namely, the regions whose governance, infrastructure and communications best enable digital collaboration are the ones who are thriving[5].

Sligo County Council is committed to being a leader in the Digital Age. However, given its geographic location on the western edge of Europe, its low population and predominance of traditional businesses, this presents challenges. It requires for the council, a comprehensive and innovative approach to putting the region on a competitive footing with the rest of Ireland and further the EU. Being just good enough, won't be good enough.

Sligo needs to become an exemplar of a Digital Leader pushing boundaries to create a place of ideas, innovation and invention, with a modern and productive economy that draws in investment, visitors and talent.

This strategy outlines the progress necessary between 2020-2023 in becoming a leading digital city-region. This is a critical aspect necessary to deliver Sligo's vision of being a leading Smart City and region by 2025[60].

Digital technology is increasingly the backbone of all industries, regardless of the nature and type of business not least traditional regional business like retail and manufacturing.

Embracing digital technology throughout all sectors, locations and occupations must be core component to the future of the region's international competitiveness.

It is clearly emerging that the future vitality of cities is increasingly based on their ability to use digital networks in intelligent, strategic ways.[6]

SECTION 2. EXECUTIVE COMMITMENT

The leadership team in Sligo has the ambition, to lead, collaborate and innovate digitally, and showcase nationally and internationally what is possible in a city of 25,000 residents and a wider region with 90,000 inhabitants.

Sligo County Council's executive is committed to strategically investing resources to support research, innovation and skills development, as well as creating and fostering a healthy and vibrant environment for entrepreneurship to flourish[13].

This strategy is framed within a 3 year horizon (2020-2023) and will deliver early wins and initial success, it will also be an accelerator leading to more comprehensive 5 and 10 year strategies and plans for the region.

There are 4 strategic pillars on which the Local Authority can focus its efforts and resources to enable this ambition, these are;

1. Improving digital skills,
2. Better digital infrastructure,
3. Increasing digital services, and
4. Fostering the innovation economy.

By providing leadership, focus and resources in these 4 areas, solid foundations and enablers will be created, supporting the digital future of the region. It can help accelerate the region's digital ambition and enable significant scaling of digital services and the digital economy over the longer term.

Furthermore, numerous innovative initiatives are already underway which showcase the region's capabilities, such as:

- The upskilling initiatives underway with the local skillsnet training programmes and the advanced management programmes run by the local chamber of commerce,
- Building ducting into infrastructure projects as in O'Connell street that can be rented to multiple fibre providers, eliminating future digging of the street,
- The council services that can be paid for online,
- A vibrant local tech cluster,
- Ambitious artificial intelligence and analytics start-up scene, and Innovative education institutions producing high quality graduates.

Strategic Outcomes

This strategy will deliver tangible outcomes within 3 years, these include;

- a reduction in fleet fuel bills for the council by up to 10%,
- real-time data to improve decision making & inform service design, and
- new revenue streams from sharing Local Authority infrastructure.

In addition the Local Authority will create new structures, such as a Digital Development function, that can;

- plan, coordinate, manage and exploit digital initiatives across the region,
- establish and manage Sligo as a 'Regional Living Lab',
- work with the private sector and with other regions nationally and internationally to share best practices, and
- lead the region's digital initiatives into the future.

Strategic Innovation

At the conclusion of this strategy Sligo will have multiple sources of new data, and leverage new technologies such as predictive analytics, artificial intelligence and machine learning. It will use analytics internally to improve services and share externally with public and private partners to deliver initiatives, services, support innovative start-ups and create new revenues.

Sligo will innovate fast, fail fast where initiatives are not succeeding and accelerate the initiatives that deliver the greatest impact and benefits to the region.

Investment

Sligo is committed to significant ongoing and sustained investment in digital and green technologies over the life of this strategy, and will insist on both digital and green assessments in all initiatives and investment programmes both at the initiation stage and closing stage.

In addition it will partner with a combination of Local, National, EU and private investment sources to deliver on its vision and enable ambitious scaling over the longer term.

Sligo commits to building a sustainable digital future for the region, that provides a fantastic location to live, work, visit and establish businesses.

The Sligo region is well suited to meet this challenge and thrive, because it has the leadership, both the commercial and political will, coupled with strong academic, and community foundations supported by a vibrant enterprise and start-up community.

SECTION 3. CONTEXT

Sligo finds itself with a convergence of factors which make it a unique region. These are both challenges and at the same time unique opportunities for people living and working in the area. They include socio-economic, political policy and technical factors, among others that should be considered in the context of shaping this Digital Strategy.

The following is a brief summary of the various factors that are at play and influence Sligo especially in relation to its digital future.

Socio-economic context:

Sligo town had a population of around 20,000 in the 2016 census[7] which was a slight reduction of 1.3% from 2011. Furthermore, Sligo – the county, had in 2016 the biggest change in rate of urbanisation since 2011 (up from 37% urban to 40%)[11] This shows clearly that there is rural depopulation occurring with net growth in the city.

From an income perspective, the average household income in Sligo in 2016 was amongst the lower quartile in the country at just over €35,000[23], and 50% less than that of the highest Local Authority area (Dun Laoghaire). Both of these indicators show clearly that the region is both suffering rural decline and less economically prosperous than other parts of the country.

A recent report by North Western Regional Assembly (NWRA,2020, 22) outlines how the region has significantly been lagging behind other regions in Government Investment in Key Growth Enablers.

Specifically:

- Government investment in national, regional and local infrastructure – per km of road – has been behind the State average in recent years. (Sligo received 51% of the national average investment between 2008-2018)
- Capital investment in the region's Higher Education Institutes – per undergraduate student enrolled – has been behind the State average over the past number of years.(71% of the state average between 2013 – 2018)
    - Capital investment for postgraduate and research facilities in the region's Higher Education Institutes – per head of population – has been behind the State average in 8 out of the last 11 inclusive years.
    - Higher Education Institutes operating in the region received Science Foundation Ireland funding - per head of population – below the State average in each of the last 11 inclusive years.
- Capital investment in health infrastructure – per head of population – has been below the State average in 8 out of the last 11 inclusive years (approx. 55% of the national average in 2018)

Policy at National and EU levels context:

From a national policy perspective, Sligo is designated as a Regional growth centre under the Governments ten-year National Development Plan[8]. As such, it has significant infrastructure investments and developments underway. These include the Western Distributer Road, the N4 upgrade and the new Garavogue bridge. Sligo County Council is committed to ongoing development of the region and has 'the vision, capacity and ambition to be the regional growth centre for the North-West' [9].

The region serves a hinterland that extends into surrounding counties with strong employment sectors, including pharmaceutical and engineering, higher education, health services and, importantly, tourism.

Both the County Development Plan[10] and the Local Economic and Community Plan[11] share the same ambitious vision, that of 'County Sligo to be an enterprising, creative, inclusive and resilient location, which values and celebrates its unique environment, rich culture and heritage, and where the wellbeing of current and future generations is central to everything we do.'

Furthermore, the Sligo Tourism Strategy[12] sets ambitious targets towards continued development of the tourism industry across the region to promote increased visitor numbers and associated revenues to the region.

At a national level policy level, in a recent government report published, Future Jobs Ireland 2019[31], a clear understanding that technology continues to herald new ways of doing business with new economic opportunities for Ireland and its regions, and a clear commitment is made by the government to focus on 5 pillars, namely; embracing innovation and technological change, improving SME productivity, enhancing skills and developing and attracting talent, increasing participation in the labour force, and transitioning to a low carbon economy.

Furthermore, the Sligo Tourism Strategy[13] sets ambitions targets towards continued development of the tourism industry across the region to promote increased visitor numbers and the associated revenues to the region.

Digital readiness context:

In a 2018, a Digital Readiness Assessment[32] was conducted by Indecon (www.indecon.ie/). In it, they set out the current status of the Local Authority against seven measures of effectiveness.

These were 1. Transitioning to Digital, 2. Digital Economy and Employment, 3. Digital Skills, 4. Digital Services, 5. Infrastructure, 6. Innovation and 7. Entrepreneurship Community and Culture).

This provided Sligo with a benchmark against other peer local authorities. Since then, various initiatives and actions have progressed in a planned and structured manner to further develop Sligo's digital status. Sligo has made significant progress on this digital journey.

Smart City[14], Broadband & Green initiatives Context:

Sligo County Council has a number of digital initiatives underway (such as the planned pilot data collection from smart street lights) is aiming to position Sligo as a Smart City Destination by 2025[15].Part of this includes a vision that states; "Sligo will be a Global exemplar for Smart city technology in towns of 25k+ inhabitants and will be the location of choice for deployment of new Smart Technology initiatives in towns this size".

In a highly relevant and related manner, the contract to deliver the National Broadband Plan[16] has been signed in Q4 2019 and aims to deliver on the Government's commitment that effective broadband connectivity is vital to social inclusion and economic growth at local and national levels.

From a Climate action context, the National Climate Action Plan[17] is a national commitment to tackle climate disruption. Both the Government and public bodies have an important role to play in taking early action on climate which is fundamental to achieving our decarbonisation goals. In September 2019, Sligo importantly and unanimously endorsed its own Climate Actions Strategy.

Given these important considerations, all initiatives and projects outlined in this Digital Strategy should be clearly classified showing the impact they will have from a Smart or Green (or both) perspective and the impact of all projects measured accordingly.

Region in Transition Context:

The European Commission[18] – via the latest Eurostat regional statistics – have reclassified the Northern & Western region from its previously held status as a "More Developed Region" to a "Transition Region". Sligo County , which is part of the Northern & Western region has therefore been re-classified as a region in transition.

The research[19] also shows that regional disparities in Ireland remain significant and are increasing, with Productivity (GVA per worker) in the Northern and Western region 98% of the EU average.

Furthermore in the 'Regional Competitiveness Index' The Northern and Western region ranks only 177th place in the EU, (Dublin is 89th), due to below-average results for infrastructure, market size and efficiency.

A recent OECD[20] report relating to regions in industrial transition, states that these regions typically face challenges in modernising their industrial base, upgrading the skills of the workforce, compensating for job losses in key sectors and raising low productivity that limits income growth. It is believed, the report states, that overall, regions will benefit from technological progress and related developments, however it is important to remember that some places and certain population groups risk being left behind.

A key discussion from the OECD report relates to targeted, place-based policy strategies and approaches to preparing for the jobs of the future.

This includes broadening innovation diffusion, stimulating innovative entrepreneurship, supporting the transition to a climate-neutral economy, and ensuring an inclusive and just transition in regions in transition. And it offers guidance on how innovation-led regional development policies can facilitate a forward-looking approach to industrial transformation.

Sligo is a region in transition and this digital strategy forms part of creating a future-proof digital infrastructure that is a foundational aspect to enable the digital transformation of the economy.

Regional Skill base context:

Given the major challenges ahead, especially digitalisation and climate transition, a skilled and educated workforce is vital, and it is crucial for existing and new workers to acquire the right skills. Still a relatively low percentage of the population have basic digital skills[23], which might hinder their active participation in a society increasingly reliant on digital tools.

There remain significant skill gaps and needs for investment in these skills. With a large majority of jobs requiring strong digital skills, the relatively low level of basic digital skills in the workforce is a barrier for greater uptake of innovation. Measures have been taken to increase basic and advanced levels of digital skills especially with the Skillnet activities in the region.

However, further investment in education and training would be still needed to provide workers with the skills required, including digital and those skills needed for a smooth and just transition to a climate neutral economy.

Nationally there are measures to address the digital skills shortage to fully exploit the opportunities of the digital age. In 2019, 53% of the adult population had an overall basic or above basic level of digital skills, still below the EU average (58%) .

Future Jobs[31] framework foresees closing the gap with the EU in terms of digital skills with a target by 2025. Given the clear skills gap, it is vital that progress in developing and expanding the region's digital skills receives close monitoring and support.

Innovation Context:

Innovation is a key part of the digital future and of Sligo as a region. There are guidelines, supports and best practices that are being developed by the European Union to assist with innovation and regional development. Sligo is very well suited to embrace many of these, some of the most relevant include: Open Innovation 2.0 and the Entrepreneurial Discovery Process (EDP).

Open Innovation 2.0:

The Open Innovation 2.0 approach that has been adopted by the EU[22] as a policy in the Digital Single Market Strategy.

Open Innovation 2.0[23] (OI2), is a new paradigm based on a Quadruple Helix Model where government, industry, academia and civil participants work together to co-create the future and drive structural changes far beyond the scope of what any one organisation or person could do alone[24].

Entrepreneurial Discovery Process (EDP)

European best practice in relation to regional prioritisation for innovative sectors, fields or technologies points to an entrepreneurial discovery process[25] (EDP), whereby the region emphasises the importance to prioritise 'investment based on an inclusive and evidence-based process driven by stakeholders' engagement and attention to market dynamics'[26]. This means that the Sligo Region should focus on the areas that are emerging within the region from a start-up, entrepreneurship, research and innovation perspective and foster, support and help these to grow.

Digital strategy context:

It is in the context of these various factors that this Digital Strategy has been prepared. It is also important to consider when framing this strategy, its scale, its reach and the resources available to Sligo during the 3 year lifespan.

The recent digital readiness assessment[32] set out benchmarks along 7 thematic pillars, and while work has progresses along each during the past year, for the purpose of this Digital Strategy, and in order to create a meaningful and manageable plan for the next 3 years, a number of these pillars have been combined into 4. These 4 are as follows:

Sligo Digital Strategy Themes - 2020-2023
1. Increasing Digital Skills across the county
2. Improving Digital Infrastructure
3. Delivering Digital Services & Community/Culture initiatives
4. Fostering Innovation, Enterprise, Digital Economy & Employment

Table 6 Sligo Digital Strategic Themes

This Digital Strategy will be implemented, managed & monitored, aligned against these 4 themes.

The existing local strategies have been examined, gaps in any areas identified, and appropriate projects, (summarised in Appendix I below) have been identified under these themes to take Sligo to a higher Digital level, notwithstanding resource constraints.

SECTION 4. WHY DOES SLIGO NEED A DIGITAL STRATEGY

Lively, competitive cities, towns and communities need to keep pace with change. Advances in digital technology have transformed the way we live, work and experience the world around us. New technologies have empowered our residents, visitors and businesses to be greener, more global and more connected than ever before. While the future is uncertain, it is clear that by 2025, workers and enterprises will be operating in a changed economy.

Figure 21 Digital Economy

At the same time, the City of Sligo's residential population is also growing faster than ever, there are now well over 20,000 (people living in the City of Sligo local area, and this is planned to grow to over 25,000 by 2025.

Services

If the communities continue to grow they will expect a high level of services and products, delivered when and where they want them, 24/7. They will also expect a greater level of accountability and interaction with public services, and this is evident in the pilot out-of-hour usage of the library in Tubbercurry as a digital centre.

We believe this is a positive development and the Council needs to adapt to meet this challenge. In order to do this, change is needed: Change in how the services are shaped, change in how communities are engaged with, change in support for local businesses and service providers. In addition the council also need to change the way it works as an organisation.

While a digital strategy is only one aspect supporting this change, nevertheless this is a challenge all levels of government are facing.

Public bodies around the world must respond to digital disruption to continue to be effective and accountable to the public.

Continuing to digitally transform Sligo's public services will have a number of positive impacts including cost reduction and service efficiency.

We believe these benefits can only be truly realised if all our communities are digitally enabled, skilled and included.

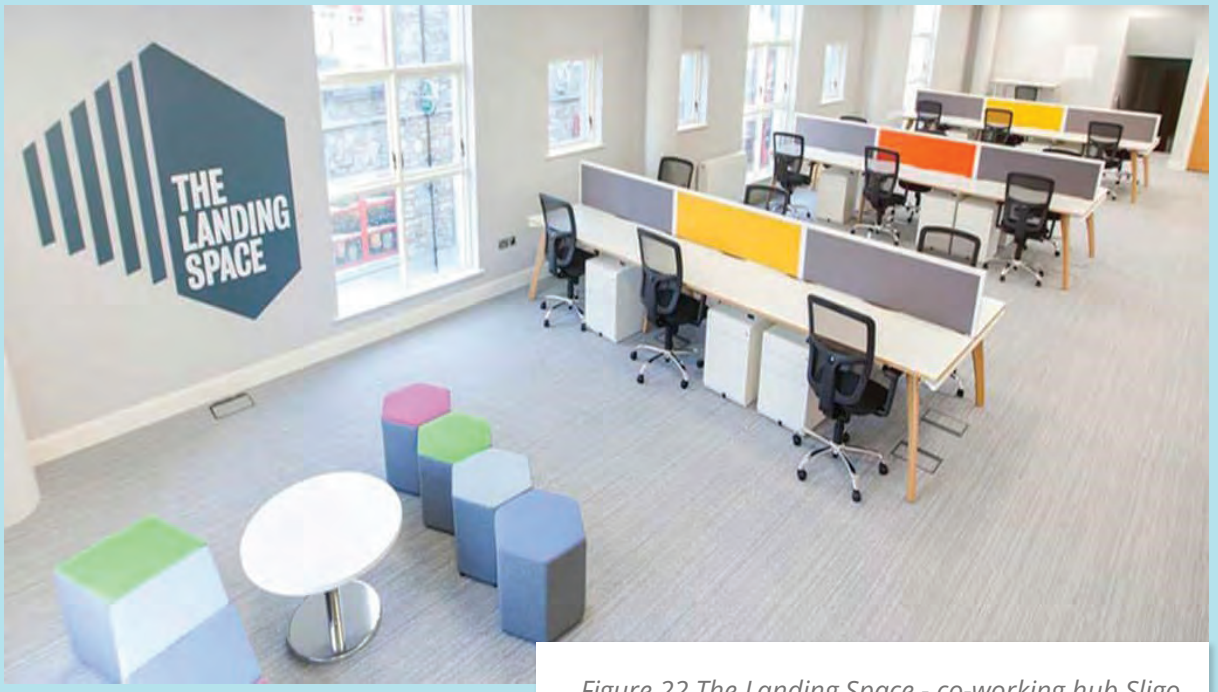


Figure 22 The Landing Space - co-working hub Sligo

Inclusion

Sligo has publicly stated its commitment to be at the forefront of digital services and Smart city initiatives and in this strives for excellence. This Digital Strategy is focused on helping the Council proactively respond to a changing environment. As well as transforming the way it works, it will also transform how it helps both communities, and businesses be successful and actively participate in the digital era.

Digital technology paves the way for greater accessibility to information and services than ever before. It is a great enabler for all members of the community and has particular benefit for people in remote and isolated locations or those with special needs.

Sligo has been classified as emerging or formative from a digital maturity perspective (Indecon, 2018)[28] and is committed to transformative digital change over the coming years.

However the Council is aware that rapid advances in technology risk causing a digital divide in our communities between those who have access to and see the benefit of digital engagement and those who are unable to share this.

One of the most important outcomes of implementing this Digital Strategy will be that Sligo becomes a more connected and inclusive county.

This cannot happen if sections of communities are left behind – it is vital to work with all our communities, provide local access to services, good connectivity, access to online services etc, to ensure Sligo's digital future is for everyone.

The Digital Strategy is not just a reaction to a changing landscape; it is an opportunity to reshape the future in Sligo to ensure all our communities can thrive. The region's digital future must be people-led, not technology-led, but using technology as a key enabler.

Figure 23 Inclusion in the Digital world

Economy

Sligo will need to attract and retain the best talent from around the world to be competitive as a location to start, grow or locate businesses.
This strategy is about helping existing small-to-medium businesses – the foundation of the county's economy– to realise the benefits of developing their digital capability for their own future.
Small businesses comprise well over 90%[13] per cent of all Sligo's businesses and contribute significantly to the economy.

It will be those businesses that incorporate digital strategies who will thrive as they will be able to raise the profile of their businesses, provide better or new services to their existing customers and help gain new ones.

Furthermore, the key to future success for Sligo is providing local skilled graduates with a range of opportunities to work and live locally as well as the opportunity to return and settle down in the region after gaining experience abroad.

These opportunities can be in a variety of industries from Agriculture to manufacturing to Fintech with Artificial Intelligence and Machine Learning driving innovation across all areas of traditional and new industries.

The people, organisations and businesses in the local region should have the infrastructure and connectivity, as well as the information, skills and capability, to engage with and benefit from digital technology. This strategy starts the journey towards achieving this goal.

SECTION 5. THE VISION FOR SLIGO'S DIGITAL STRATEGY

Implementing a Digital Strategy will change the way the Sligo County Council works and how it engages with its residents, businesses and visitors. It will help Sligo position itself to capitalise on technological changes and enable the local economy to futureproof itself.

The Digital Strategy identifies four strategic priorities to deliver the results needed to achieve success for a digital Sligo:

1. Increasing the Digital Skill base
across the county, by championing inclusion and lifelong learning to ensure the businesses and communities, especially vulnerable people, are digitally skilled, confident and literate.

2. Improving Digital Infrastructure
across the county. Providing, enabling and advocating – the infrastructure needed to ensure the region's global competitiveness, and the technology, services, and supports to enable businesses thrive in the digital future of Sligo.

3.Delivering Digital Services & Community/Culture initiatives.
Creating people-centred programs and services using technology to be both more efficient and responsive to the needs of the communities. Engage with citizens and communities, using technology to transform how people in the local area engage with public services, and influencing the kind of region they want to live and work in.

4. Fostering Innovation, Enterprise, Digital Economy & Employment.
Creating a collaborative environment to foster innovation and entrepreneurship along with supporting innovation, SME's, promoting partnerships between public, academic, business and community actors, and becoming a desirable location for businesses to locate.

The primary objectives of this digital strategy are to place County Sligo at the forefront of a digital transition by:

1. Accelerating of the deployment of digital infrastructure to enable Sligo achieve its SMART Sligo ambitions,

2. Activating a rich ecosystem of public, private, academic and civic partners in a collaborative process to make the digital vision a reality,

3. Establishing and managing an appropriate governance structure to manage the ongoing digital initiatives and delivering value to all stakeholders.

Objectives also include the support of the climate action agenda, increased economic activity and improved social inclusion. All of these objectives are addressed in the context of an evolving national and international landscape which is far from uniform between regions.

With the launch of this strategy, Sligo County Council intends to take a leadership role in accelerating digital transformation, thereby creating an environment that activates a vibrant ecosystem where innovation, collaboration, partnerships and investment provides a future for residents, visitors and businesses.

The strategy will see the transformation of County Sligo into a leading Digital and Smart Region with the aim of realising its vision, in particular;

1. Creating and promoting energy efficient streets, towns, villages and neighbourhoods;

2. Leading the evolution of smart transport, delivering better public transport, less traffic congestion and lower emissions;

3. Building evidence based decision making capabilities using sensor-based data streams.

4. Exploiting the capabilities of data and analytics to provide the information which enables the ongoing improvement of all aspects of the city and its environs. This can include, better environmental information on water, traffic congestion, anti-social behaviour, planning decisions, etc.

5. Presenting the Region as a 'Living Lab' that will collaborate with leading edge national and international organisations innovating, testing, developing and scaling future generations of digital, e-health, tourism and IoT solutions.

6. Supporting a vibrant ecosystem of innovative partners including start-ups, SME's, Multi Nationals, Academic, Health and Civil partners, and enabling a vibrant culture of leading edge innovation attracting high quality companies and jobs to the region.

Figure 24 Futureproofing

In order to achieve these priorities Sligo must:

a. Innovate ethically both internally and with its partners in the information & technology marketplace to share information that benefits the community,

b. Lead by example on digital change by adapting the way it works and delivers programmes, and

c. Facilitate partnerships – with private companies, education institutions, community organisations and other levels of government to maximise the creative, social, economic and service benefits that digital technologies offer.

SECTION 6. WHAT DOES SUCCESS LOOK LIKE?

A digital city and county provides major benefits for residents, visitors and businesses. Digital inclusion increases social and civic engagement, improves opportunities for business to succeed and scale, facilitates community development and contributes to the creation of employment opportunities as well as the economic health of the region[29].

All communities should to have access to, and confidence in, digital technology together with awareness of the benefits it can bring. Access to information, and an understanding of how to use it, will improve and enrich the lives of residents and visitors and contribute to business success.

We are already seeing our communities adopt the digital services provided by the Council, such as the online payments for various services. There is the opportunity to build on these initiatives to continue to deliver value and usefulness to the wider community across the region.

Continuing to transform services so they best suit a community which expects to engage online will lead to a more efficient local government, capable of responding to the needs of communities to transact how and when they want. It will enable the Council to respond more effectively to people's needs.

The continued expansion and improvement of online payments as well as new online applications for services will give the public easier access to public services.

Figure 25 Digitising forms

A digital county will also revolutionise the way people get to work through more efficient transport, automation, accessible real time data and multimodal transport information. It will change how they enjoy leisure activities, how they interact with the built environment and even how they engage with the democratic process. Being better connected will enable our communities to participate more fully in decision-making to influence the kind of region where they want to live and work.

Figure 26 Data for Evidence based decisions

Improving the county's digital infrastructure with initiatives such as publicly accessible Wi-Fi, and the installation of various sensors, will both connect communities and provide an environment where creativity and commerce can grow.

These improvements will provide access to data that will inform longer-term planning and policy decisions on management issues such as public transport, congestion, noise levels, air quality, availability of public spaces, road closures and energy usage.

A comprehensive and industry leading dashboard will collect and present all relevant data and information, enabling evidence based decision making across all functions.

This dashboard will provide a visual indication of status, trends and alerts, as well as providing relevant data feeds to approved external services and third parties, and has the potential to evolve into a digital twin[30].

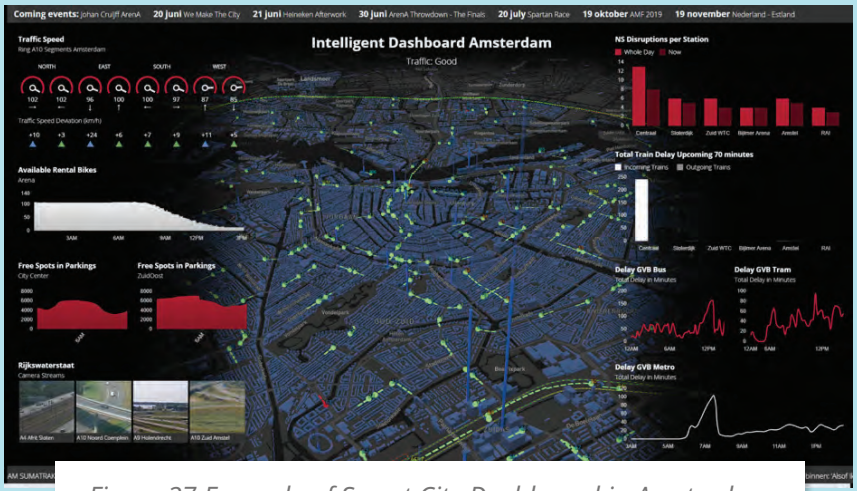


Figure 27 Example of Smart City Dashboard in Amsterdam

There is the recognition[31] that innovation is important in generating the economic wealth for regions like Sligo. The Council is already fostering a culture of support for innovation, with particular focus on entrepreneurship, by providing low cost co-working spaces to the start-up sector.

Sligo County Council's various initiatives and participation, through its Local Economic Office (LEO), outlines the Council's approach and commitment to playing a meaningful role in the growth of the start-up community in industries such as Artificial Intelligence (AI), Machine Learning (ML), Data Analytics, Augmented Reality & Advanced Manufacturing among others.

Sligo County Council commits to foster a culture of supporting innovation internally, becoming an early adopter of the new Government's Future Jobs Ireland[31] initiative, with a digitally-enabled workplace that offers flexible working arrangements, and nurtures its employees to upskill for the future to attract and retain top talent.

The Council will collaborate with business, government, academia, education providers and advocacy groups to actively participate in realising the digital future of Sligo.

The council will ensure that every initiative and investment is given consideration from a digital, green and smart perspective and that the necessary approval and governance mechanism is in place to manage these.

In short, as a digital county, the Sligo region of 2025 will be a better place to live and work for everyone.

Figure 28 Digital Innovation

6.1 Key Performance Indicators

Measuring the success of this strategy and the initiatives undertaken needs to be based on firm outcomes that contribute benefits to the region both subjectively and objectively. The following Key Performance Indicators (KPI's) have been prepared with objective targets for each of the four strategic themes.

Sligo Digital Strategy Themes - 2020-2023	Indicators 2020-2023	KPI for 2020-2023
1. Increasing Digital Skills across the county	Additional Digital Skills and Programs provided	Provide digital skills training for 500 Micro businesses and SME's in the region (or 2000 people)
2. Improving Digital Infrastructure	Building digital infrastructure into major engineering programs	Broadband to be rolled out to at least 6500 additional homes, shared ducting to be installed in 2+ km of new roads/streets.
3. Delivering Digital Services & Community/Culture Initiatives	Sligo County Council developing capabilities to offer additional services online	Deliver 3 new services online and enable 3+ communtiy/culture intiatives to be launched. Increase Council/Citizen online interaction by at least 25%
4. Fostering Innovation, Enterprise, Digital Economy & Employment	Promoting the region as a second FDI location, fostering new startups or university spinouts with grants or Proof Of Concept funding, enabling small companies to work with the council.	Increased employment in the digital economy, with 20 new enterprises launched and/or 1000 new digital jobs created. Enable at least 5 local SME's/MNO's/Startups to innovate with Open Data sources provided by the Council.

Table 7 Digital Strategy 2020-2023 KPI's

SECTION 7. PRIORITY 1: INCREASING DIGITAL SKILLS ACROSS THE COUNTY

The greatest resource of the region is its people. An innovative, enterprising, adaptable and well skilled workforce can be the foundation for increased regional sustainability and improved living standards over the longer term. The availability of talented, adaptable and skilled people has long been key among Ireland's differentiators in attracting international foreign investment and supporting and fostering the growth of indigenous enterprises, including innovative start-ups, regional SME's and internationally scaling enterprises with high growth potential.

The National Skills Strategy[32] recognises this from a Government level, and Future Jobs Ireland[31] clearly states that there is a need for the creation of entirely new roles in the workplace, and Ireland's economic success relies on our ability to transform and adapt with Digitalisation requiring people to learn new skills.

It is important that enabling people adapt to the new skill sets required is at the forefront for Sligo's digital future.

As technology changes, significant disparities in access and opportunity are emerging. With an increasing proportion of economic, social and government activities going digital, people who are not digitally connected or engaged are less able to experience the benefits of digital technology and if a digital divide emerges, some communities will become disenfranchised. Similarly SME's and family business who do not transition towards the digital economy are at risk.

This digital strategy will focus on enabling digital access, understanding and skills across all communities along with fostering, supporting and enabling digital among the region's businesses.

7.1 Examples of what Sligo is already doing

Sligo already provides digital skills training across the region (via the skillsnet & Local enterprise office initiatives), and is growing continually on a yearly basis[33].

There are a range of initiatives underway that help support the increase of digital skills across the region. These include:

- A range of offerings , (training courses, workshops and seminars) from the Local Enterprise office that includes IT Skills, Social Media, Mentoring & Management development.

- Sligo Chamber Skillnet, providing a range of QQI accredited training & professional development programmes, seminars and workshops. The topics include business development, leadership & management.
- The North West Regional Skills Forum (NWRSF) whose mandate is increased communication and engagement will ensure the skills needs of business are met to support job creation, sustainability of business and the availability of talented human resources.
- IT Sligo Employment Services provides online bespoke work based learning programmes for companies in the region.
- St Angela's College provides a range of Health and Education courses, with graduates at NQF Level 7, 8 & 9.
- Mayo, Sligo and Leitrim Education and Training Board provides a wide range of further education and training programmes across the region.

7.2 What needs to be done?

While there are lots of activities underway it is important that education, training and upskilling offered across the region closely reflect the actual skills required to sustain and drive the local economy.

From a digital strategy perspective this should include a range of digital related offerings coordinated across the various providers that take a stepped approach through the full spectrum from digital awareness in family business, to managing in remote work environments, all the way to leading global digital and knowledge based businesses.

IT Sligo has a range of Level 6,7 & 8 courses available on digital technologies, AI, ML and Data Analytics, including: MSc Data Science, MEng Connected & Autonomous Vehicles, BSc in Smart Technologies & various BSc courses in Software and Games development.

7.3 Goal: Promote & increase digital skills across the region

Sligo needs to develop programs that encourage skilled, digitally-literate, resilient businesses and communities capable of accessing and enjoying the benefits of digital technology.

7.3.1 Ways to achieve this goal:

There are a number of tangible actions that Sligo can take towards achieving this including:

- Supporting informal initiatives to encourage digital learning involving neighbours, friends and colleagues, peer organisations and chambers of commerce helping community members to 'go on, get online'; and
- Encouraging all citizens and communities to have easy access to digital supports, skills, motivation and access through ease of access and zero cost,
- Continuing to build on the skills development programs offered at our community centres and libraries to improve digital literacy amongst young and old people, people with disabilities and people who are unemployed, upskilling and job seeking with specific targeted offerings for different groups, especially the isolated, aged and digitally challenged.

7.4 Goal: Upskilled small & family businesses

Sligo will work to ensure that SME's and small or family businesses have the skills and infrastructure needed to participate fully in the digital world.

7.4.1 Ways to achieve this goal:

In some cases it is small interventions, almost direct support, that is needed, in others more structure is necessary. Many interventions and supports can be achieved without significant investments. These include:

- Promoting and holding events to raise awareness of the benefits of digital technology with local case studies and direct training and interventions available;
- Forming partnerships with education institutions and non-government organisations to ensure residents and businesses have the skills and infrastructure they need;
- Supporting innovative mechanism of upskilling (an example is the transition year schools program piloted by the Chamber of Commerce - showing what digital products/services are available currently to help your small businesses, i.e. dropbox etc)
- Consider making vouchers or resources available to deliver deeper interventions and help to get local business on the digital journey and look at how businesses can better engage with the communities where digital inclusion activities will be most effective such as Facebook, twitter etc.
- Consider providing an e-commerce masterclass to give local businesses skills and knowhow to sell globally.

Figure 29 Enabling digital upskilling

7.5 Goal: Provide advanced skills to local enterprises

Support local enterprises and SME's to scale internationally and attract, manage & retain talent with digital expertise.

7.5.1 Ways to achieve this goal:

This will build upon some of the good work in the Skillsnet programs and align towards skills that help business grow and scale internationally. Actions to achieve this include:

- Provide training to work with the 'now' generation and managing in this modern digital world
- Support succession planning including leadership training
- Provide management training and certification where possible
- Collaborate with IT Sligo to deliver growth and leadership modules such as Mini MBA etc.

7.6 Key opportunity:

7.6.1 Promote Sligo as an SME/Micro business Digital Leader

Sligo is ideally placed to become a digital leader in SME's and small or family businesses. The region has a wide range of SME geographically dispersed family businesses and a large proportion of businesses in the start-up, family, micro, and SME range with over 90% of people employed in enterprises of 10 people[13] or less.

Recommendation:

Establish a cross-sector SME/Micro digital cluster to support with knowledge sharing, delivery of workshops, upskilling etc., similar to the existing industry clusters that are proving so effective in the region.

Figure 30 Digital Leadership

An example of this is The Digital Garage[35] which is a non-profit programme from Google delivering free digital skills training via an online learning platform and face to face at its HQ in Dublin. This platform provides individuals with a tailored training plan to learn digital skills, completely for free.

Another example are the many Massive Open Online Courses (MOOCs)[36] that are freely available online courses for anyone to enrol in provided by some of the leading Global Universities.

A similar initiative, using the available online resources, supported by a face to face element, albeit at a much smaller scale, with a mix of public, academic and private support may really benefit the region.

The future success of the region depends on residential and business communities being digitally active.

The regions needs to develop programs that encourage skilled, digitally-literate, resilient communities capable of accessing and enjoying the benefits of digital technology.

SECTION 8. PRIORITY 2: IMPROVING INFRASTRUCTURE FOR DIGITAL

In this 21st century digital economy, the phenomenon described by some as 'Industrial Revolution 4.0', is being enabled and driven by communications services and the infrastructure required to deliver them[37].

Key enablers of this are ongoing improvements in information and communications technology, investments in digital infrastructure, and the increasing ubiquity of connectivity. A greater proportion of the economic activity of the Sligo region will be dependent upon the quality and reach of communications services, furthermore it will become a potent differentiator of national economic efficiency and international competitiveness.

8.1 Examples of what Sligo is already doing

Sligo has a number of initiatives underway in this area, these include:

- Developing co-working hubs such as An Chroi in Tubbercurry and The Landing Space in Sligo town.
- Upgrading public buildings, such as currently in the Library in Tubbercurry, to be a digital resource and service centre, and accessible to the public outside of core opening hours.
- Innovating with sensors, such as those contained in Photocells on street lights, to collect data that can be used to inform evidence based decision making.
- Including shared ducting in the design and build stages of infrastructure projects, such as the O'Connell Enhancement, the Western Distributor Road and the Cranmore refurbishment, to facilitate future digital services and potential new revenue sources. For example the Cranmore initiative, as part of new works, will facilitate bringing ducting to each home at lower cost eliminating any further digging.
- Broadband Connection Points (BCP's) in schools and community centres in underserved areas being prepared for rural broadband installation under the National Broadband Plan.
- WiFi4EU[38] for county wide deployment. 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 municipalities throughout Europe.

8.2 What needs to be done?

Continue the program of co-working spaces and community hubs with digital services and high-speed connectivity.

Expand the model in Tubbercurry library to additional locations, including other libraries. Explore, where possible and practical, increased use of community locations in various towns and villages across the region to deliver connectivity options to remote communities.

Proactively promote, advocate and drive the rollout of the National Broadband plan to the Sligo region as a priority.

8.3 Goal: Improving access to digital infrastructure

Provide the community with public access to digital infrastructure and services.

8.3.1 Ways to achieve this goal:

- Provide digital connectivity through the County's existing neighbourhood and community spaces.
- Advocate for public access to digital infrastructure in private spaces and encourage others to do the same, such as in shopping centres and public spaces (leisure facilities, playgrounds, event spaces etc) run by other government agencies.
- Support the National Broadband Plan, identify infrastructure gaps in the communities for prioritisation, and proactively engage with the National Broadband Ireland (NBI) team for Sligo rollout.
- Continue to improve access and skills through libraries and community centres, including simple things like encouraging use online banking and services;
- Identify opportunities for digital inclusion as part of built environment projects.
- Continue to design-in shared ducting to all capital and refurbishment projects across the region.
- Install sensors, at every opportunity to collect data that can be used to make evidence-based decisions to deliver better services to the region.

8.4 Key opportunity:

Sligo has started to embrace the potential of digital infrastructure as both an asset and a strategic differentiator of the region. There is an opportunity to formalise this as a core aspect of the Council's current operating model:

Recommendation:

- Create a policy to ensure all future initiatives, projects or investments are futureproofed by always considering the Smart and Green impact in all initiatives at planning stages.

- Become the leading Local Authority in Ireland in Data Driven & evidence based decision making.

SECTION 9. PRIORITY 3: DELIVERING DIGITAL SERVICES & COMMUNITY/CULTURE INITIATIVES

The Council will improve the design, efficiency, effectiveness and responsiveness of its programs and services to meet the changing needs of communities and deliver a better experience for everyone. It will use existing and new digital platforms to engage with residents and business to support the functioning of public focussed processes and be an early adopter of new technologies and digital tools.

In addition, Sligo County Council will ensure it continues delivering high quality non-digital service delivery to all customers, so no one is left behind. However, it must prioritise the offering of digital services and ensure digital inclusion for all communities.

The Council will continue to develop, evaluate and improve the accessibility of online information and services so it becomes more inclusive to a wider audience, a good example is the recently launched Sligo.(dot) website, providing comprehensive access to information relating to living, visiting and investing in the region.

Although it believes digital transformation is key to meeting this challenge, the solutions need to be people-led, not technology-led.

People-centred service design

People-centred service design doesn't involve just applying technology to existing services, it means re-thinking those services and how they fit within the organisation – and positively transforming the experience of the service for all communities.

Digitalising the Councils services enables individuals to access their own data and records while also selecting services to meet their needs at times that suit them. It allows them to transact with the Council efficiently.

This is already available to an extent on the Councils website where residents and business can conduct a number of transactions online including paying their rent, rates or BID payments and online meetings.

As communities continue to increase their interactions with the Council online, digital transformation will mean some of the services could become fully automated with simple, intuitive interfaces designed to suit the customers.

Digital transformation will mean communities will have a 'multichannel' interaction with Sligo County Council – from the bricks and mortar experience, to online. In order to achieve this, the council will need to understand and curate each part of its customers' journeys.

This won't be a static one-off change to the programs and services, it will be a continual process of transformation.

The council will use the data from digital technology to continually inform its staff, and adapt the processes and the technology underpinning how it deliver each service, to suit the changing needs of communities.

People-centred digital programs and services are about delivering a better experience for the user, while creating efficiencies and benefits for the Council.

Collective storytelling with communities online is an exciting way for people to share their experiences of life and work in the Sligo region, explore what is on offer and find out about the services and activities available nearby.

Sligo County Council commits to collecting feedback and using data analytics to help plan improvements to its customers' experiences and council services.

9.1 Examples of what Sligo is already doing

Sligo County Council already enables citizens and businesses to interact online including online payment for a range of services.

Furthermore, Sligo is engaged in a number of innovative projects and initiatives that are a combination of Smart and Green and digital, these include;

- Energy savings from Street Light refresh to low energy LED, combined with using Smart photocell sensors to collect data for evidence-based decision making.
- Collaborating with Queens University Belfast to measure water quality and predict potential issues especially in the blue flag beaches.
- Sligo is adopting an open data structure that is capable of sharing data with various stakeholders, businesses and citizens.

9.2 What needs to be done?

Significant progress has been made in recent years and this needs to continue at an accelerated pace.

The council need to collaborate with its customer community and prioritise digital initiatives and services based upon both a combination of benefit to the community and economic impact.

Examples of what can be worked on include:

- Enable Council services across digital platforms
- Enhance the open data program
- Promote digital activity through communications and engagement tools

9.3 Goal: Enable additional Council services across digital platforms

Explore the potential for any council services to be delivered digitally and consider in future a digital first approach to new services wherever feasible. The council should embrace digital technologies wherever possible to deliver cost savings, carbon footprint reductions and operational and service improvements.

9.3.1 Ways to achieve this goal:

There are many potential initiatives that can be undertaken, while each stakeholder group will have its own priorities, the following are a short list of those that might be considered as a priority:

- Review the existing council services to determine which can be delivered digitally and prioritise based upon impact, service and return on investment (ROI) benefits, examples include:
    - offering customers a smart ePlanning service to make it easier when preparing and lodging development applications, or
    - ticketless parking in the town via a mobile app, or
    - pre-reserving parking spaces to minimise un-necessary congestion while trying to find parking spaces.
- Develop digital design principles and a method for ensuring people-centred service design at all times, and implement them across the organisation in all service areas
- Increase internal Council use of digital technologies for meetings to reduce cost, travel time and carbon footprint (e.g. Microsoft teams, Zoom video conferencing, Google hangouts etc.). Measure the time, energy and cost savings.
- Measure & monitor all energy usage within council properties using sensors.
- Evaluate systems that help manage council assets better, such as fleet, physical infrastructure, energy, trees etc.

9.4 Goal: Embrace and Scale the Open Data Programme

A cornerstone element of open government is open data. Leading global public sector digital strategies see open data as critical. Sligo can focus on open data initiatives that translate into real benefit to citizens, communities and business in the region.

Connected applications, in an open context, can put real-time, transparent information into the hands of users to help them make better choices46. They can save time, reduce waste, and even help boost social connectedness.

9.4.1 Ways to achieve this goal:

- Identify key regional challenges that could be resolved by open data and/or open API solutions (e.g. online transport information, location of salt stores, real-time road gritting updates etc). This can easily be incorporated into the existing Open Data initiatives.
- Embrace open APIs into open data and publish data for both business & citizen use.
- Support the open data community through an online forum (consider how it may link with an SME forum) where new data sets, ideas, visualisations and proof of concepts can be discussed .
- Establish priority for ongoing releases.

9.5 Goal: Promote internal and external digital activity using communications & engagement tools

Increase citizen involvement through digital engagement at council, community, enterprise, citizen and indeed visitor levels.

9.5.1 Ways to achieve this goal:

- Communications and engagement activities should be designed to promote and encourage residents, businesses and employees to use digital technologies in order to communicate with the Council.
- Consider a revamp of the Sligo County council website to make more engaging for digitally literate citizens and businesses (a good example is the new Sligo.ie website)
- Look at methods to provide richer information and engagement to visitors to the region, such as providing QR codes beside historical plaques, that provide voice, video and augmented reality content for visitors and residents.
- In some cities start-ups have begun using Augmented Reality/Virtual Reality to deliver immersive visitor experiences such as Rome[39].

9.6 Goal: Improve digital engagement and data sharing with communities

Sligo County Council will look for opportunities to improve digital engagement and data sharing with communities.

9.6.1 Ways to achieve this goal:

- Integrate existing platforms with social media and other online platforms that communities use to provide a more personalised experience; and
- Consider testing participatory digital decision-making channels, in a co-creation manner, enabling citizens to give comments, feedback and views on the work of the Council through an online platform, including via social media, website and surveys, online submissions to public consultations, or online polls to prioritise certain initiatives etc.
- Use live polling to collect community views during consultation events and meetings.
- Promote the data sets that are available and a clear mechanism for 3rd parties to engage with the council to share the data in a mutually beneficial, secure and ethical manner.

9.7 Goal: Make digital the primary communication tool

Transition to digital technology as the primary method of communication while understanding which service areas need to stay non-digital.

9.7.1 Ways to achieve this goal:

- Identify when non-digital communication must be maintained.
- Identify where possible to integrate social media use to better meet the needs of younger people and those who prefer to use social media.
- Focus on the development of a single, coherent online environment for communities to communicate and transact with the Local Authority in the one place and,
- Move towards providing a more personalised experience of communicating with the Council.

9.8 Key opportunity: Position the Sligo region as a leader in digital connectivity and engagement nationally.

Digital technology is both increasing the connections in our communities and changing how people connect with one another. In addition to more traditional social networks, many people now belong to a number of virtual communities, which exist on social media and other digital channels.

These communities can be based on their geographical location, interests or identity. Technologies and digital platforms are enabling these virtual community groups to take more ownership of their local environment as well as share knowledge and resources and access services that might otherwise be out of reach.

An opportunity exists to use online forums or community groups hosting 'meet ups' and digital storytelling[40], which provide avenues to present information and explore multiple layers of the region that may otherwise be invisible.

This may enhance social cohesion and connectedness in the region. The two-way conversations these new digital platforms enable can mean the region has the ability to better connect with our communities.

The reach, accessibility and immediacy of digital platforms and social media, and the ease with which content can be sent and received, allow far more people to contribute to solving regional challenges.

In future, digital engagement with communities could lead to benefits such as crowd-sourcing policy innovation, shared problem solving and more instant feedback loops that will improve the whole city and county.

Sligo will become 'smarter' and learn from customer feedback in a more systematic way, helping deliver better services that are more relevant to the needs of communities.

The future of Sligo County Council is not about creating a bigger delivery team, it is about being a highly connected player in a large ecosystem. Sligo wants to be a 'smart city' – but smart cities are not smart just because of technology – they have smart governance and empowered communities sharing knowledge and intelligence about their region.

SECTION 10. PRIORITY 4: FOSTERING INNOVATION, ENTERPRISE, DIGITAL ECONOMY & EMPLOYMENT

Digital technology is transforming and disrupting the way organisations do business, whether public, private or not for profit.

Given the challenges of this digital disruption, a pattern is emerging: the cities whose governance, places, infrastructure and communications are best setup to enable digital collaboration are the ones who are thriving[41].

Smart cities, and indeed smart regions, add digital intelligence to existing urban systems, making it possible to do more with less. When cities function more efficiently, they also become more productive places to do business[42].

The most innovative regions that most effectively harness the energy, talent and creativity of its residents will secure the most investment and attract and retain the best talent, which in turn attracts business, entrepreneurship, investment and innovation.

Sligo has leading education institutions, in IT Sligo and Saint Angela's College which act as the digital knowledge hub of the region. In addition the local Education and Training Board (ETB) provides a range of programmes that benefits the local economy.

The knowledge economy of the wider region has great potential but it needs new infrastructure, new businesses and new essential services as well as more suitable workspaces in order to thrive.

In 2011 the region had 55.6% of its workforce employed across agriculture, manufacturing or public services. This is 33% greater than the national average, showing a large dependence on these industries in the region.

It is clear that Sligo County Council must support a diversified local economy that is more resilient and looks to the future. A key output from this digital strategy must be a culture to ensure support for innovation in both new and existing enterprises while enhancing the reputation of the region as a collaborative, connected, dynamic and innovative place that attracts and supports talent.

International research[43] shows that regional economies need to be planned, fostered, and include alignment of regional potential, innovation and research based on the needs and ambition of the regional economy. In this regard 'Smart Specialisation' is suggested as the key.

Smart Specialisation can be defined as a Research & Innovation Strategy for Smart Specialisation (RIS3) which is an Integrated, knowledge-driven economic transformation agenda tailored to the local context.

Innovative, high-growth potential companies

Nurturing and attracting highly skilled innovators locally benefits the region's economy. New companies which are using innovation and technology to tackle a large and often global market, have the potential to grow fast and to create more jobs and economic growth than any other.

These new companies will directly provide a range of new jobs from web-designers and media producers, through to market researchers, virtual personal assistants and a wide variety of freelancers or contractors. These innovators and the people they employ will support a range local professional, retail, service and leisure industries.

In order to attract talent, and to nurture the talents of those who already live in the local area, we need well-managed urban environments with vibrant neighbourhoods, high quality digital infrastructure that attract clusters of talent to live and work.

[The region has a number of active & vibrant industry clusters:

TECH NORTH WEST

Tech North West Cluster:
Tech North West is an alliance of companies working in the technology sector in the northwest of Ireland. The goal is to promote Sligo-Leitrim as a unique and thriving location for businesses and employees.

www.technorthwest.ie

Atlantic MedTech Cluster

Atlantic Medtech Cluster:
The Atlantic MedTech Cluster is a collaborative business organisation comprising of a number of specialist Med-Tech industry companies, all working together to position and promote the Northwest of Ireland as a global centre of excellence that is internationally recognised for its expertise and competence in design and manufacture of medical devices.

www.atlanticmedtechcluster.com

Fostering a vibrant tech start-up ecosystem is as much about the liveability of the area and supporting small business as it is about providing access to flexible workplaces and capital investment opportunities.

In producing this Digital Strategy Sligo County Council is highlighting its digital ambitions by positively signalling to the talented and innovative considering Sligo – to explore new possibilities in the region.

It is vital the Council positions the wider Sligo region as a supportive digital-friendly place, that can attract and retain talent, because these companies will create the jobs of the future.

Small to medium enterprises (SMEs) and family businesses

SMEs represent a very large proportion of the region's workforce, 90% of people are employed in enterprises of 10 people[44] or less, and although a growing number of them are digital-ready, we believe many could make fuller use of digital technology.

Outside of the existing and growing ecosystem of tech start-ups there are a large number of existing SMEs operating in non- tech industries which require support and baseline infrastructure to build their capacity, attract and retain skilled staff and ensure Sligo remains economically competitive in a digital world.

Some of these businesses lack the resources, time or capacity to explore, adopt and maximise the benefits of new technologies and applications. Equally many do not fully understand the benefits on offer for their businesses.

It is vital that the council promotes understanding of the benefits of the digital economy for SMEs. In the future SMEs will need to be online and digitally enabled to operate their businesses, grow their customer base, access international markets or work with larger businesses. Digital is always evolving and so this is not a one-off but an ongoing programme.

As reported by Deloitte[45], small to medium businesses that have advanced levels of digital engagement are:

- 1.5 times more likely to be growing revenue,
- earning 1.4 times more revenue per employee than in the previous year,
- more than 8 times more likely to be creating jobs,
- 7 times more likely to be exporting,
- more than 14 times more likely to be innovating by offering new products or services.

Whether the SME is in manufacturing, services or retail they will need to develop their own digital strategies and incorporate them into their core business in order to thrive.

10.1 Examples of what Sligo is already doing

There are already a number of initiatives already underway in the region that help foster innovation and employment, these include:

- The Council supports the establishment of co-working spaces, fosters the tech start-up community and supports innovation in business
- The Council plays a role in facilitating introductions and networks of members, including supporting the ecosystem with government and industry bodies, such as the London-Sligo Network, and local industry focus groups & clusters.
- A Memorandum of Understanding with IT Sligo to work together on a range of real-world projects, research areas and new initiatives.
- Along with the Local Enterprise Office, Sligo Chamber of Commerce supports a program of training, workshops and seminars covering online business topics for all businesses.
- Supporting the preparation of a comprehensive catalogue of all businesses ('lookupsligo') across the region and making it available online to facilitate finding businesses and competencies in the region.
- Digital Futures Manufacturing Centre, (DFMC) based in Sligo, serving the northwest and border regions has recently been funded. This centre once operational will have a primary focus on supporting industry with developing capability in automation of manufacturing supply chain technology and creating an environment to allow companies focus on developing and implementing Industry 4.0 strategies.
- Recent initiatives

In recent months a number of global organisations have already begun early developments and testing of new initiatives using the concept of Sligo as a living lab.

These include:

i. Sligo is now a HSE Digital Health Living Lab for older people including large global organisations such as Amazon working jointly and independently on exciting new initiatives. This innovation is a large step in supporting the 'Stay left, Shift left' digital health transformation strategy of the HSE and supported by Three Ireland. This has potential for the region to develop into a Remote Digital Health Management Centre of Excellence over the coming years.

ii. Global Telecom Infra Project (TIP) includes hundreds of companies – from service providers and technology partners, to systems integrators and other connectivity stakeholders, driving infrastructure solutions to advance global connectivity, Sligo County Council is now a member of this community.

- Sligo and in particular Strandhill is the first rural location selected for global field trials during Q3 & Q4 2020.

- These learnings will form the knowledge basis from which a blueprint will be created that is capable of being replicated in similar regions globally.

10.2 Goal: Support business to enable the region's digital economy

Support local business and innovators to participate and thrive in order to drive the region's economy. While much work has already been done, it is important to continue with existing efforts and to expand them.

10.2.1 Ways to achieve this goal:

- Foster partnerships with stakeholders to build on emerging and established clusters in technology, med-tech, manufacturing and data analytics;
- Prioritise relevant, tailored and accessible support that helps business to attract and retain talent in Sligo;
- Celebrate and promote digital success across both the start-up and broader business communities.

10.3 Goal: Continue promoting and supporting SMEs become digitally enabled

Sligo County council will continue to work with SMEs to help them realise the benefits for their businesses of going digital and improve the digital skills of their employees.

10.3.1 Ways to achieve this goal:

- Raise awareness of the benefits of digital technology for SMEs;
- Connect SMEs with relevant training and resources to build their digital capability;
- Consider how to better include SMEs in the procurement processes; and
- Foster opportunities that enable SMEs to maximise their productivity and growth through digital technologies.

> The recent initiative by The Strand Campus to create the first purpose-built gaming hub in Ireland is a great example of fostering new innovation in a cluster and is a very exciting development for the region.

10.4 Goal: Promote the Sligo Region as a 'Digital Living Lab' for Smart & Green Innovations

A living lab is a user-centred, open-innovation ecosystem, often operating in a way that integrates current research and innovation processes within a public-private-people partnership.

It can be thought of as a space where users are immersed in a creative social space for designing and experiencing their own future. Living labs are natural sites of convergence, bringing together different approaches to solve real-life problems.

Living Labs are most easily incorporated in smart cities or regions; an urban development vision to integrate information and communication technology (ICT) in a secure fashion to manage a region's assets.

Through the use of sensors integrated with real-time monitoring systems, data is collected from citizens and devices, then processed and analysed, to allow city officials to interact directly with a community in order to enable a better quality of life.

Living labs share a fundamental principle with smart cities: that citizens and businesses are empowered to work for the betterment of their own quality of life, whether through data collecting, co-creating projects, or user-centred research.

The EU programme, ENoLL[47], the European Network of Living Labs is world leader in this respect.

Sligo can lead the way in Ireland by becoming a Smart and Green regional Living Lab. Furthermore, from a best international practice, Smart Specialisation Strategy perspective, positioning the region a specialist hub in emerging technologies, such as Artificial Intelligence (AI), Machine Learning (ML) and Data Analytics merits consideration. There are emerging activities in this area and skills across the region.

10.4.1 Ways to achieve this goal:

Nominate and promote the region as a centre for one or more aspects of digital technologies (e.g. Artificial Intelligence, Machine Learning, Advanced Data Analytics, Mobility etc) & actively collaborate internationally.

- Proactively engage with technology innovators and suppliers and work with them to develop innovative solutions;
- Actively continue to promote the region to innovative multi-national companies wishing to test new solutions, jointly innovate with partners, or develop leading edge technologies.

  Examples of this are;

- the collaborative partnership with the Electricity Supply board (ESB), which combines smart sensors along with data analytics to reduce the energy footprint in the region.
- the work underway with ARM testing their new Smart Spaces solution in the Landing space and in IT Sligo,
- Innovations with both Ubicquia and Westire in Smart street lights
- Collaboration with Amazon Web Services and ThinkSmarter on providing data for evidence-based decision making.
- Collaborating with Telecom Infra Project and Facebook's new connectivity initiatives by being an early test bed.
- Collaborating with the HSE on their new innovations and become the e-Health living lab for aged care in Ireland.

- Increase cooperation with IT Sligo, Enterprise Ireland and other agencies and international research institutes to pose challenges for research & start-up innovation.
- Increase the network links with International cities and regions, for example the Sligo-London network and explore greater technology synergies such as fintech etc.
- Actively engage in Living-in.EU[48], The European way of digital transformation in cities and communities, sign the declaration and participate in the various projects and initiatives that are underway. (https://living-in.eu/)
- Become the first Irish Smart city or region to join and actively participate in the European network of Living Labs (https://enoll.org/)
- The region should consider actively creating and promoting an AI/ML/Data Analytics cluster combining private companies, emerging start-ups, third level institutions and supported by local development agencies and public bodies.

10.5 Goal: Establish a Quick start framework for Proof of Concepts

The goal is to develop an easy access proof of concept (PoC) program to allow digital entrepreneurs to utilise municipal assets or infrastructure to demonstrate innovation in the local digital economy. The program will represent a partnership between public, private, academic and community partners.

10.5.1 Ways to achieve this goal:

- Establish a framework for Proof of Concepts (PoC) to demonstrate innovation within the community

Identify partners that can assist with implementation and evaluation of the program Conduct a pilot PoC to test the framework and monitoring process.

Create a programme that issues a number of 'Smart' or 'Green' challenges annually to innovators, start-ups, academic institutions. Offer incentives to the winners to trial their solutions, with the prospect of a contract with the Council should certain metrics be achieved. (the Small Business Innovation Research (SBIR) initiative in Dublin may be a good reference)

- Create special purpose vehicles for 1,2 or 3 years that can procure and manage early POC's in the smart and digital arenas
- those that are successful and have huge potential can be brought forward for consideration to scale and included in formal procurement processes
- Plan to implement an open and accessible Wi-Fi network in key areas of the region's public domain as a basis for 'smart city' projects including data collection through sensor networks.

Look at a regional test bed portal, a good example is the Test Bed Sweden initiatve, which collects all the available test bed opportunities and acts as broker to enable collaboration between public, private and academic organisations.

10.6 Key opportunity: Establish an incubation program for digital companies

Strengthened by a strong digital infrastructure and the proposed digital district, a digital incubator will encourage digital talent to stay and/or locate in Sligo and support digital-based social innovation.

10.6.1 What needs to be done?

- Create a partnership combining multiple stakeholders to operate the incubator (e.g. Dogpatch Labs in Dublin)
- Promote incubator to digital start-ups
- Launch program
- Establishing a visiting entrepreneur program
- Celebrate successes

SECTION 11. ENABLING ACTION 1: BE AN ETHICAL INNOVATOR IN THE INFORMATION MARKETPLACE

In a digital world, cities, and indeed regions, themselves are becoming networks producing data. This is known as 'city analytics' and communities will increasingly demand access to this data to manage more effectively and benefit from the opportunities available from the digital transformation. Use of government agencies data to provide real time public transport information is a well known example of how data can be repurposed by software developers to provide useful public benefits.

As discussed in earlier sections, there is a need for the Sligo County Council to move from static, largely one-way communication with its communities to two-way people-centred digital communication that will help improve and prioritise operations. To do this, the Council will use data from its own operations and the information provided by its service users. This will also lead to more transparency, enhanced community dialogue and participatory decision-making and equity in communities.

Providing access to data in the digital era is as important as building transport infrastructure was in the industrial age. If properly managed, the use of data will enable the Council not only to improve its own performance but that of the wider Sligo region.

Information marketplace

Across the world, communities need access to digital information to stimulate and maintain economic and social growth[50]. The amount of data being generated and collected is growing and the processing power to analyse and visualise that data is becoming faster and cheaper.

More and more local governments are developing 'information marketplaces'[51] – ways of sharing and exchanging information – for 'open data'.

Developing an information marketplace will assist the Council in improving services and policies, encouraging innovation and economic development. Better data gathering and information systems will increase efficiency and reduce effort. A pilot open data platform is being created that can be the foundation for this 'information marketplace'.

As Digital transformation continues it will see an expansion in the Council collecting, providing, analysing and using data.

However, the data the Council holds covers everything from sensitive personal information held to allow delivery of personalised services to non-personal information about council operations.

The emerging circular economy, enabled by technology such as AI, can provide significant benefits to the region in future years.

Any open data must be both technically usable and legally open. When we talk about sharing 'open data' in the information marketplace, we mean non-personal and non-commercial data.

Transparency and privacy

Open data is key to enhancing transparency and accountability to communities.

The Council already releases much of the information it produces, however, currently a lot of it is in non-machine readable formats. While releasing open data and making it searchable provides huge opportunities, there are also privacy risks in doing so.

For example, releasing machine-readable open data could lead to moral and ethical issues as predictive analytics – making predictions based on analysing patterns using modelling, machine learning and data mining – have become more sophisticated.

> The security of sensitive information, the security of our digital infrastructure and public and international confidence in Sligo as a safe place to do business online is crucial.

Also the convergence of cloud computing, social media and mobile computing technologies has created data security issues worldwide.

People are increasingly willing to give up private information in exchange for faster or better services if the interactions are open and honest. However, making available real-time datasets from sensors in the built environment, mobile phone data and people's personal or wearable devices – so called 'Big Data' – has privacy challenges.

Legislation, such as the Data Protection Act 2018[52], sets out how the Council and other public bodies must manage personal information. The Act sets obligations regarding the collection, use, disclosure and the provision of access to personal information. It also requires Sligo County Council to take 'reasonable steps' to protect the personal information held from misuse, loss and from unauthorised access, use, modification or disclosure.

Online users cannot assume that responsibility for information security rests solely with the organisations they interact with, or with local government or agencies. The Council should continue to educate communities that security is an ongoing process of collaboration. As digital technology opens up possibilities for improvement, it also provides new opportunities for exploitation from anywhere at any time.

> The Council must identify the influence it can have in promoting Sligo's digital future – and then use that influence effectively to get the right infrastructure and networks in place to ensure Sligo is globally competitive.

11.1 Examples of what Sligo is already doing

Both internationally and in Sligo, public libraries are leading the way in building digitally inclusive communities by providing digital infrastructure, delivering lifelong learning programs, celebrating digital creativity and increasing access to information, knowledge and skills.

The council are exploring the potential of street furniture such as streetlights and bus stop shelters to contribute to the digital infrastructure of the county.

A trial is underway collecting data to measure the usage patterns of streets and carparks in the town centre area.

The Council will creatively use data and city analytics to improve the performance and operation of the region, the systems and the infrastructure.

11.2 What needs to be done?

The opportunity exists to expand open data initiatives to benefit local communities and business and to utilise data to support evidenced based decision making and collectively plan for the future of the region

Sligo will also operate ethically in the new information marketplace, meeting privacy expectations and encouraging understanding of emerging security issues,

11.3 Goal: Build infrastructure & frameworks to manage open data & information marketplace.

The initial open data pilots are already planned and learning from internal experience and collaborating with external local authorities, public bodies and private organisations will help inform and prioritise the ongoing development of open data initiatives.

11.3.1 Ways to achieve this goal:

- Understand what data is available and relevant to the Councils current activities;
- Identify the datasets currently available, what their value (usefulness) is and how they can be made open and accessible;
- Strengthen the Councils capability to analyse data – and its ability to feed the insights gained from that data into improving its products and services;

- Engage with innovators and data users about how to use data better, and how to improve and maintain open data;
- Assess the economic benefit of different types of open data and use this information to both raise awareness and prioritise open data activities;
- Consider the potential for Smart and connected street lights that deliver tangible benefits
    - pilot smart connected streetlights in places like newly planned Stephens street cultural plaza and some surrounding streets. Use the results of this to project potential energy savings across the Local Authorities' lighting estate, which could potentially be millions of euros.
- Understand the privacy implications of data sharing, both from a regulatory and an ethical perspective; and
- Promote digital safety across the communities.
- Ensure data protection, privacy and security are core considerations in all initiatives.

11.4 Goal: Influence the provision of digital infrastructure

The Council needs to understand where and how it can use its influence to get the right infrastructure in place to help communities, businesses and residents to thrive.

11.4.1 Ways to achieve this goal:

- Look at the requirements of our different communities and identify the digital infrastructure gaps.
- Understand the existing broadband fibre networks in the city, what extensions are needed and how to support the rollout of the national broadband plan to serve these needs as a priority.
- Engage with technology innovators and suppliers and work with them to develop innovative solutions;
- Plan to implement an open and accessible sensor network in key areas of the council's public domain as a basis for 'smart city' projects including data collection through sensor networks.
- Conduct further research through academic and government networks and the C40 cities climate change leadership group in the areas of smart energy, smart transport, smart water, smart waste and smart healthcare and how they could benefit the city and contribute to building a resilient city; and
- Develop a framework for assessing and prioritising 'smart city' opportunities.

SECTION 12. ENABLING ACTION 2: WHAT DOES THE COUNCIL AND ITS WORKFORCE NEED TO DO?

Sligo County Council cannot achieve many of its digital ambitions without fully embracing a digital mindset within the organisation itself. It needs to lead by example.

12.1 Goal: Establish a Digital Development Function

With digital being central to many aspects of how Sligo delivers its services, interacts with its workforce and develops new projects and initiatives, it is important that there is a central function that coordinates and manages this. The creation of a Digital Development Function, mandated from senior executive level, with cross functional responsibilities is critical to success.

The Digital Development Function will be responsible for ensuring all aspects of digital transformation are embedded across the region and managed, controlled, and delivered in a coordinated, secure, measurable and structured manner. The function should be created in collaboration with existing senior management, ICT, Broadband and include external partners and stakeholders in its design.

Its remit needs to be defined, but may include, among other things, the following:

- Ensuring Digital initiatives are considered at the initiation, planning and deployment of all projects.
- Planning, advocating and implementation of any digital infrastructure across the region.
- Utilising digital technologies and available data to provide space utilisation metrics, before during and after any initiative to provide valuable input to return on investment measurement wherever possible.
- Designing, planning and implementation of any smart sensors to collect data for evidence-based decision making.

- Management and development of any data platforms to deliver information, insights and evidence-based decision making abilities to internal and external stakeholders.

- Management of all Smart City or Smart Region initiatives and effective hand over of these to the relevant teams when they become core part of the Council operations.

- Investment appraisal of all digital/Smart initiatives and return on investment measurement.

- Data management and Data exploitation. Managing the increasing data volumes that will be created and working in effective ways to utilise this data to improve services, create revenues or build partnerships with organisations to help exploit the region's data assets.

- This can be a broader function that expands to a broader role to manage the wider city assets, subject to defining a new business unit.

- Be the key council representative on any external or joint venture or other vehicles.

- Define the scope of this function, collaborate with internal and external stakeholders and shape its remit,

- Deploy effective governance, a 'Collaboration Model' to manage all the various layers needed for successful Digital and Smart City initiatives, as proposed in Section 12.2 below,

- Establish an organisation structure, a proposed functional structure is shown in Section 12.5 below,

- Trial the function on a 1 to 2-year basis,

- Refine as needed and establish permanently.

12.2 Governance Model for Digital Development Initiatives

One of the most important aspects of successful deployment of any Digital or Smart initiatives outlined within this strategy, or others, is the governance model that is put in place.

Increasingly, the services provided by councils are moving into a digital environment and are taking on digital components or ancillary services. In this context, it is vital that a Local Authority assumes responsibility for the digital infrastructure, just as it previously assumed responsibility for analogue services and infrastructure, such as roads and water networks, and ensured that they worked efficiently together.

In doing so, the Local Authority will need to put in place its strategic governance model that takes responsibly for key aspects as well as providing management and oversight for other aspects vis a network of subcontractors and third-party

There are many layers necessary to put in place a Digital and Smart City infrastructure that enables planned and future initiatives to be deployed, managed and run effectively.

12.3 Reference model for Smart and Digital initiatives

Deloitte[53] propose a reference model based on six layers to give an authority a shared picture on which to base discussions, both internally and with other stakeholders. Covering central issues relevant to Digital and Smart City initiatives, such as ownership, responsibility, interoperability and standards.

The six layers shown in these models are described as follows:

12.3.1 Infrastructure

The infrastructure layer includes the fixed infrastructure including, fibre optics, sensors, cloud and mobile etc. Ownership and control of the infrastructure are vitally important to the local authority. It enables an open operator-neutral market model for its Smart City and Digital Initiatives and supports competition in the upper layers in the reference model.

12.3.2 Communications

The communications layer includes the active communications solutions that are the basis for end-user services and applications. The local authority needs to make a carefully considered decision selecting the supplier of the active communications infrastructure. This will help avoid lock-in effects and wherever possible the chosen supplier should not be active in the upper layers in the model because it may constrain innovation and competition.

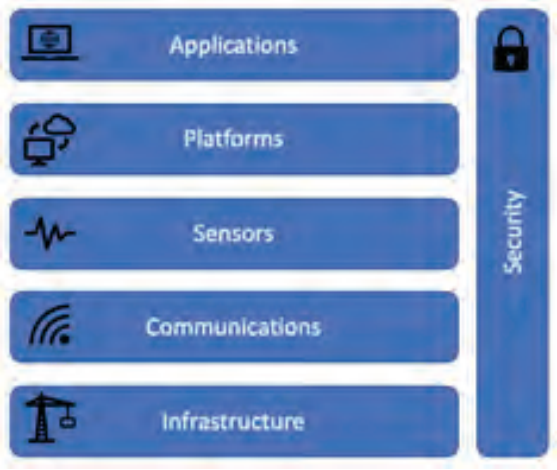


Figure 1 Reference model for Smart City Infrastructure (Deloitte, 2017)

12.3.3 Sensors

The sensors layer refers to the various devices (IoT devices, beacons, CO2 sensors etc.) that are used to collect data and information within the city. The local authority should have a consistent strategy for the use of sensors with regard to standards and protocols for facilitating data communications and creating uniform data. This will minimise any additional costs or complexity that may arise in the future when various verticals must be integrated.

12.3.4 Data platform

The data platform level contains all the aggregate data and information that the local authority collects and manages. It is recommended that the authority adopts an “openness to big data” philosophy. That way the stakeholders will be able to combine data points from different verticals in order to create useful and efficient services and applications. A key consideration is to build a flexible data storage solution based upon open standards to again avoid lock-in situations.

12.3.5 Applications

The applications layer contains the solutions and applications developed for the stakeholders and citizens. The primary responsibility of the local authority is to provide input to the applications, outlining specifications needed, and where it shall make sure that the rest of the infrastructure is in place to facilitate the application and to enable other actors also to develop their applications.

12.3.6 Security

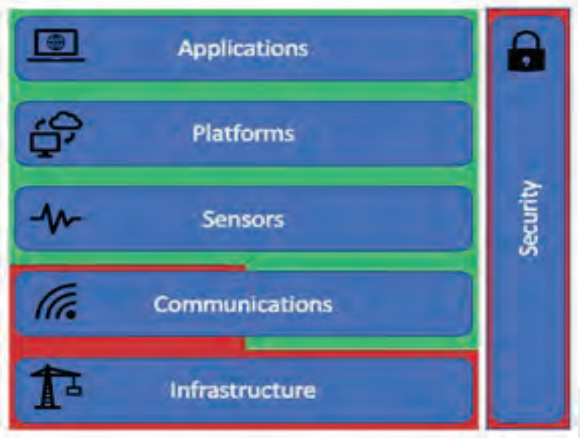
The security layer refers to the technologies, solutions, etc., that will assure data security and privacy across all the solutions and applications. The local authority should have a central strategy for security and the orientation should be to have a main actor that is responsible for overall security control of the city's various horizontal layers.

12.4 Proposed "Collaboration Model" framework for Sligo

In practice a variation of this model called the "Collaboration Model" has proven to be suitable and effective in various local authority and city situations. In the recent Sligo Smart City report this model is recommended as a good fit for Smart City Initiatives in Sligo.

Having reviewed this model it is recommended that this 'Collaboration Model' is also a very good fit for Sligo in an expanded remit to successfully deliver on the wider regional Digital Strategy initiatives.

In this Collaboration Model, Sligo takes main responsibility for the layers in the reference model that are critical to providing the conditions for diversity of actors and services and thus fostering competition in order to avoid negative lock-in or interoperability problems.



The city is responsible for infrastructure, security and the city's procurement of communications services and works closely with responsible 3rd parties for the other parts of the reference model

Figure 31 The Collaboration Model (adapted from Deloitte, 2017)

Other parts of the reference model are performed by external actors or by the Local Authority, depending upon which is best equipped to do so. If the choice is for an external actor, it is important that Sligo County Council provides clear specifications with an overall view of preventing vertical lock-ins.

The goal for the specifying organisation is to have a horizontal perspective on each layer and to verify that all internal and external actors comply with set standards and procedures so that the city's verticals are able to communicate with each other.

12.5 Proposed Organisation for Digital Development & Governance

As discussed in Section above, it is recommended that Sligo establish a new "Digital Development Function". Given the strategic importance of Digital and Smart City initiatives over the coming decade, it is recommended that this office has a mandate from the CEO and strong cross functional links with the Senior Management Team.

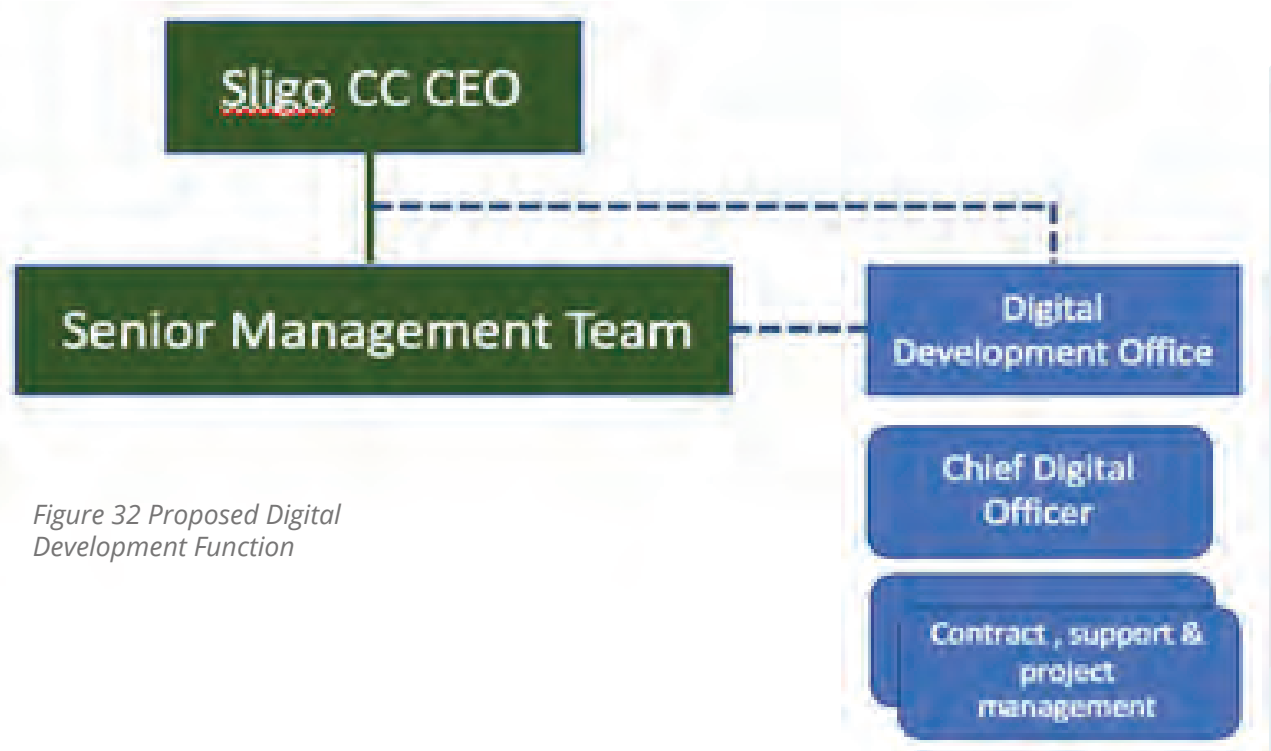


Figure 32 Proposed Digital Development Function

The proposed Digital Development Office should be run by a Chief Digital Officer with responsibility for all Digital and Smart City initiatives including managing all 3rd party contracts necessary to deliver these. Table 8 outlines the type of role necessary by the Digital Development Office at each layer of the collaboration model proposed in Section above.

Reference model layer	Digital Development Office Role
Applications	Provide input on standards and specifications to enable 3rd parties to develop applications or solutions either for the authority or commercially
Platforms	Create an 'open standards' flexible data platform capable of combining multiple data sources and facilitating future application development. This is likely to be managed by the local authority and delivered by specialist by 3rd party(s)
Sensors	Set a consistent strategy & standards for sensors, including protocols, data structures, communications etc. Manage all sensor deployment by the authority, and approve all provided by external providers subject to standards
Communications	The local authority should engage a 3rd party operator to manage the communications infrastructure and help commercialise it. It is important that this is closely managed on an on-going basis. It is good practice that the provider of this service is not a provider of services at the upper levels in the reference model to minimize risk of lock-in
Infrastructure	Ownership and control of the infrastructure are vitally important to the local authority
Security	Digital office to have overall control for setting, managing and enforcing all security protocols and procedures. This is likely to be a specialist individual and/or a specialist 3rd party provider

Table 8 Digital Development Office role in collaboration reference model

12.6 Plan for Digital Development Function & Framework deployment

Recognising these proposed models represent significant changes for the Local Authority it is recommended to adopt a phased approach. A proposed phased plan is outlined in Figure 33 below.

This proposed plan shows a gradual build up of the Digital Development Function. Initially all activities will be contained, managed and owned within the Local Authority under the remit of a new Digital Development office run by a Chief Digital Officer. During the initial phase this new office will be fully internal to the Local Authority, building and expanding the internal capacity, skills and capabilities.

As the scope of the office expands, more initiatives are underway and as additional layers of the reference model are deployed in a planned and structured manner, additional external 3rd parties will be engaged.

Initially these will be for expert specialist services such as security and communications which may need to be in place early in the process.

Over the second and third years as the function expands and the structure of the reference model layers are more established, additional 3rd party actors will be engaged, be they academic, local SMB or large multinational actors.

As the scope of the office expands, more initiatives are underway and as additional layers of the reference model are deployed in a planned and structured manner, additional external 3rd parties will be engaged.

Initially these will be for expert specialist services such as security and communications which may need to be in place early in the process.

Over the second and third years as the function expands and the structure of the reference model layers are more established, additional 3rd party actors will be engaged, be they academic, local SMB or large multinational actors.

It is recognised that this function will evolve and over the duration of this strategy establish itself as a core function managing, defining and controlling all the local authority's digital initiatives, as well as being an influential player and enabler in the wider growth of the region's digital and smart initiatives.

It should also represent the region on both national and international collaborations around digital initiatives.

Proposed plan to deploy the Smart and Digital Reference Model

2020/2021	2021/2022	2022/2023
Establish Digital Development office. Establish Reference Model Framework. Appoint Chief Digital Officer. Begin building internal capacity and skills.	Appoint external 3rd parties to support refence model - Security, - Communications. Define Sensor and Platform framework in detail, set standards and select data platform. Continue to build internal capabilities and skills. Progress priority digital initiatives and infrastructure.	Reference Model fully defined and in place. Progress multiple initiatives with internal and external Actors. Engage with various 3rd parties, academic, multinational and startups in a structured manner using the framework as a guideline. Engage 3rd party specialist companies as and when needed as scope of remit expands. Continue to expand digital initiatives. Begin to measure impact and regional benefits.

Begin internally, build capacity & skills, and engage external 3rd parties as initiatives take off

Figure 33 Proposed plan for deployment of reference model

12.7 Goal: Implement mobile & flexible workforce strategy

Working remotely, or flexibly has in recent years become an important aspect of many organisations. It can help attract and retain staff, increase employee morale and promote a lifestyle friendly work environment.

The Council must be able to provide the foundation for its employees to become empowered through use of consumer-driven mobile technologies in combination with secure enterprise technologies.

By enabling the mobile workforce, the Sligo will realise increased efficiencies while simultaneously encouraging innovation by employees.

12.7.1 Ways to achieve this goal:

- Examine roles where flexible working arrangements might be possible.
- Consider reserving one or more desk spaces in the co-work spaces, community hubs or even Libraries to enable remote workers to have a work location close to their home.
- Enable secure enterprise level communications with remote employees.
- For service delivery employees, align employee role and work requirements with mobile device provisioning.
- Trial a secure mobile device management platform.
- Implement outcome based measurements in all roles that are suitable for remote or flexible working.

12.8 Goal: Address digital skills shortages, manage digital change and increase efficiency.

This has wide ranging implications and may require changes in strategic planning, governance, operational management, management support and capability, employee user experience and technology provision.

12.8.1 Ways to achieve this goal:

- Assess the digital skill sets across the council workforce.
- Recognise and build on the existing digital skill sets across the Council.
- Work closely with members of staff who do not use technology in their day-to-day work in order to understand what skills, cultural changes and technologies are required for the transition.
- Promote awareness of the benefits of and expected behaviours associated with online collaboration.
- Try different knowledge management and collaboration tools and platforms that encourage digital teamwork and test them as a part of our everyday business processes.
- Staff will also increasingly need integrated access to the data controlled by the Council in order to use it better in their day-to-day work – new ways of working and clear standards need to be developed in relation to security, privacy and collaboration.
- Develop a process to assess security implications of proposed digital infrastructure and software so that new, innovative solutions can be supported.

12.9 Further cross functional recommendations

While these are ambitious challenges, nevertheless it's clear that this digital strategy touches most, if not all, aspects of the Council operations.

To enable efficient Governance and co-ordination it is envisaged that a collaborative structure will be put in place to include the various strands, disciplines and interests involved, i.e. Planning, Housing, Roads, etc. and to ensure that silos to not exist.

Therefore, it is imperative that action is taken immediately and changes made. There are a number of practical steps that Sligo County Council can take in the short term. These are:

1. Identify a dedicated cross-department digital services team,

2. Assign accountabilities and responsibilities for key digital initiatives,

3. Identify digital skills training needed for staff.

12.9.1 Enhanced citizen dialogue

Digital has the potential to reinvigorate and reimagine local democracy. Digital platforms broaden engagement beyond traditional forums like meetings to reach people who are short on time or not comfortable in group environments.

Welcoming communities into transparent decision-making processes where progress is monitored and shared online will result in greater trust and a higher quality of public discussion.

The challenge is for this to be more integrated with social media and the online platforms our communities use to provide a more personalised experience.

Cultural change is essential for the development of people-centred digital services, systems and innovative working practices.

As part of our research for the Digital Strategy, we interviewed staff and senior management across the Council and a recurring theme that emerged was that in order for Sligo County Council to become a more sophisticated digital organisation, digital leadership within the organisation was key to effecting successful change.

To foster a digital mindset at all levels of the organisation and bring about the kind of cultural change necessary to develop people-centred digital systems, top-down influencing and digitally skilled leadership is required from within the Council management team itself.

The organisation will need to ensure commitment to digital change combined with flexibility in the allocation of resources necessary to effect this change, becomes embedded at all levels, including at executive and Council level.

All projects and initiatives need to include appropriately skilled staff in project teams to ensure the desired outcomes of this strategy are delivered through the Council's day-to-day activities.

To evolve its mindset and embrace digital culture throughout the organisation, Sligo needs to embed digital outcomes into all projects and initiatives as well as into the annual workplans for all services.

Implementing this strategy should not be seen as new or separate to existing work. Rather the outcomes are integrated so they become part of how Sligo does business and operates on a day-to- day basis.

Sligo is innovating to become a more sophisticated digital workplace as this will help attract and retain the talent needed to stay competitive as an employer and be an active participant in the digital transformation of the region.

12.10 Key opportunity: Apply Smart and Green considerations to every initiative.

12.10.1 What needs to be done?

- Create a Smart and Green impact template for all projects at initiation
- Implement on the Procurement system a check point to ensure Smart and Green project initiation documents are included.
- Create Smart and Green impact assessment templates.
- Implement on the Finance system a check point to ensure the Smart and Green Impact assessment have been completed prior to payment.

SECTION 13. ENABLING ACTION 3: EFFECTIVELY FACILITATE PARTNERSHIPS TO MAXIMISE BENEFITS

Sligo needs to enable effective partnerships with private companies, organisations and other levels of government to maximise the creative, social, economic and service benefits of going digital. It also needs to foster relationships with an ecosystem of partners and potential partners ranging from innovative start-ups, to global multinationals and promote the Sligo region as a great place to innovate, recruit, establish and grow global businesses.

It is effectively establishing and fostering these partnerships that will enable Sligo to be better equipped to tackle economic, environmental and social challenges, stimulate economic activity and drive shared prosperity for the people of the region.

The Council has a key role in promoting the digital economy in the wider Sligo region and being an essential part of promoting the external actions, partnerships and engagement necessary to achieve many of the aspirations of this strategy which are not fully within the its direct control.

Working in partnership
Sligo County Council is not alone in seeking digital transformation. Local Authorities and indeed Cities around the world understand that going digital is crucial.

Figure 34 Digital Collaboration

All levels of government are responding to this challenge. At national level, the National Digital Strategy was published in 2013, the Government is now seeking submissions for an update version to progress further and grasp the opportunities offered by digitalisation and respond to its challenges.

Other local governments are responding to the digital challenge too. In recent months a number of Local Authorities in Ireland have also launched their Digital Strategies.

Sligo will need to share ideas and projects working closely with other local government organisations, non-government organisations, academics and universities, digital and technology industry groups and, most importantly, communities to ensure a digitally inclusive future.

Globally we are seeing the emergence of public, private and academic boards or taskforces that help shape the digital transition of cities and regions and no single entity, internal or external, has all the answers. Only strong partnerships will enable Sligo's digital vision to be realised.

Sligo understands that partnerships will be critical to the delivery of public benefits associated with a digital approach.

Sligo's spheres of influence

The Council's role in a digital future
While there are limits to what the Sligo County Council alone can control or even influence, it needs to be concerned with the full range of digital challenges that affect the region and its communities

Control
Wide range of issues of importance to the community. Possible educative, advocacy, lobbying roles of government.

Influence
Areas of partial or shared responsibility or influence. Advocacy, lobbying, education and communication are possible.

Concern
Wide range of issues of importance to the community. Possible educative, advocacy, lobbying roles of government.

What should Sligo County Council control?

- Its internal governance structure;
- Integrating digital actions consistent with the directions of this strategy into existing and new program and project plans;
- Activities associated with data collection, management, use and release;
- Remote & flexible workplace redesign;
- Delivery of digital services;
- Participation in the region's digital ecosystem; and
- Development of the council's contribution to the information marketplace.

What should Sligo County Council influence?

- Advocating for Sligo's new digital economies;
- Encouraging the adoption of digital skills, aiding capacity and enabling a suitable built environment;
- The delivery of and access to digital infrastructure across the city and region;
- Upskilling the community and celebrating good work towards digital inclusion;
- Helping people to understand the privacy issues associated with government data;
- Better public-private collaboration; and
- Promoting higher education which contributes to digital innovation.
- Fostering and promoting innovation with innovative start-ups, academic institutions, SME's and other partners.

Key partnerships

In order to influence the identified priority areas Sligo County Council will need a better understanding of the digital ecosystem of greater Sligo and its role as a participant to better connect and facilitate digital initiatives.

The Council should review governance and partnership models best practices and select the most appropriate one, taking into account Sligo's regional function and size. In general, Sligo County Council will require strong technology partnerships as an operational model and that will involve setting clear standards and digital rights.

It will help the City to exert the necessary influences to ensure maximum success and impact.

Sligo will need to identify key stakeholders to work with in order to achieve a successful digital transformation. A relationship plan should be developed for each of these groups.

It is suggested that the proposed new Digital Development Function is a good home for these activities.

Government

The Council needs to work with all levels of government – National, Regional and other local governments – to share ideas and experiences, particularly solutions to open data, service redesign and delivering digital infrastructure.

It is likely that Sligo will continue to develop joined-up services with other agencies and authorities and there is a strong need for ongoing partnerships and collaboration to promote Smart city, Green or Digital innovation.

At a European Commission level a Digital Europe programme is proposed, the EU's programme focused on building the strategic digital capacities of the EU and on facilitating the wide deployment of digital technologies, to be used by Europe's citizens and businesses, including significant funding to support investments in supercomputing, artificial intelligence, cybersecurity, advanced digital skills, and ensuring a wide use of digital technologies across the economy and society.

Industry advocacy groups

Sligo will need to continue its work existing industry groups and actively drive the digital and technology industry to identify tangible solutions to the challenges digital transformation presents for the city.

Academia and research

Sligo needs to establish a structured mechanism to work with the local education institutions and the academic community to share research and ideas for innovation.

Non-government organisations focused on digital inclusion
The Council will need to identify key non-government organisations and work with them to look at how Sligo might help them improve their capacity and skills and how they might contribute to realising the region's digital inclusion ambitions.

Private companies and business groups

Sligo will need to work with both large multinational technology companies and local innovators and start-ups to find solutions and to look at how best to promote Sligo's technology sectors. The council will also need to continue to work closely with groups representing businesses in the city.

New Innovation partners

Sligo will need to actively engage and attract innovation partners. These can range from regional innovative start-ups, or global multi-nationals wishing to field test new solutions. Fostering an open innovation culture as a 'Regional Living-lab', willingly trialling new technologies and solutions to challenges, and supporting leading edge innovation will attract and retain these partners.(e.g. Testbed Sweden[53])

13.1 Goal: Build, foster and innovate with an ecosystem of partners.

Sligo will need to work with many partners in achieving this goal, these include, but are not limited to; innovative start-ups, SEM's, traditional family businesses, large established businesses, global multi-nationals, non-government organisations, academics and universities, digital and technology industry groups etc, and, finally but most importantly, communities to ensure a digitally inclusive future.

13.1.1 Ways to achieve this goal:

- Establish a number of working groups (they might best fit within the Digital Development function), comprising staff at all levels:
    - An 'internal champions' working group to encourage and embed the digital cause and help staff within the organisation to adapt to and innovate through digital change.
    - An external stakeholder relationship working group to focus on promoting the external actions, partnerships and engagement necessary to achieve many of the aspirations of this strategy which are not fully within the region's control.
- Understand how an innovative procurement approach can ensure emerging high-growth potential technology companies can more readily participate in bidding for Sligo County Council contracts;
- The Council's approach to sourcing and working with suppliers in a more strategic way will also need to consider how small and innovative suppliers can be competitive with large, established tech suppliers to Sligo County's Council business.
- Continually publish challenges to the region's problems and invite innovative solutions from all sources.
- Liaise with academic institutions locally, nationally and internationally to push research areas that can enable new digital solutions to be found to difficult problems.

SECTION 14. DIGITAL PROGRAMS & INITIATIVES

Included here is a proposed action plan with initiatives grouped under the different strategic pillars. There are also a series of enabling initiatives included to help deliver on the strategy. It is expected that the Digital Development Office will own these intiatives and further plan, develop, manage and deploy each in an appropriate manner.

i. Increasing Digital Skills across county

Thematic area	Initiative	Impact Smart	Impact Green	Owner	Success Measure	Timescale 2020	2021	2022	2023
1. Increasing Digital Skills across county	1.1: Review existing SME & Community training available, schedule and promote as digital learning journey from basic to advanced	X	X						
	1.2: Create Regional Digital Peer group to share success stories, educate, support and digitally inspire local businesses	X							
	1.3: Establish a simple digital kick-start programme for SME's to take the first steps (drop in help, TY students help etc)	X							
	1.4: Establish a Digital Status assessment, and supports/interventions to help SME's progress.	X							
	1.5: Expand the Skillsnet offerings - additional business management training and certifications (e.g. managing millenials)	X	X						
	1.6: Establish Regional Digital Cluster for SME's - enable best practice sharing and ambition to be leading digital SME region by 2022	X							

Table 9 Increasing Digital Skills

ii. Improving Digital Infrastructure

Thematic area	Initiative	Impact Smart	Impact Green	Owner	Success Measure	Timescale 2020	2021	2022	2022
2. Improving Digital Infrastructure	2.1: Continue opening regional co-working Hubs, and promote locally & intenationally	X							
	2.2: Consider some industry focussed Hubs (e.g. Digital/Media , Data/analytics, Manufacturing etc)	X							
	2.3: Collect data using Smart/IoT sensors wherever possible to enable evidence based decision making (e.g. usage & impact of new events space in the city, measure air Quality before and after coal ban, etc)	X	X						
	2.4: Continue and expand the shared assets initiative in all new infrastructure and refurbishment projects (e.g. share duct in O'Connell St & Cranmore etc)	X							
	2.5: Advocate, support and promote the delivery of the National Broadband Plan as a priority across the region.	X							
	2.6: Expand use of council & community spaces as resource for co-working, public WiFi, digital services, tourism resources, training etc (e.g. use Tobercurry library model in more locations)	X	X						
	2.7: Create a Policy and process for ensuring all infrastucture is futureproofed by considering where possible for potential future Smart/Green initiatives	X	X						

Table 10 Improving Digital Infrastructure

iii. Delivering Digital Services & Community/Culture initiatives

Thematic area	Initiative	Impact Smart	Impact Green	Owner	Success Measure	Timescale 2020	2021	2022	2022
3. Delivering Digital Services & Community/ Culture initiatives	3.1: Expand the open data platform, collect and make available existing and new data for self service, partnering & potential innovation.	X	X						
	3.2: Develop pilot AR/VR initiatives to deliver improved services and greater experiences to visitors and communities (e.g. tourism & cultural experience, AR/VR training aids in upskilling etc)	X							
	3.3: Embrace digital channels to promote all trourism attractions across the region & use data & evidence to measure visitors and economic impact of attractions, festivals etc.	X	X						
	3.4: Make data available to enable self-service by citizens & communities for local service imporvement (e.g. location of local salt stores allowing individuals de-ice driveways and paths)	X	X						
	3.5: Measure & monitor all energy usage within council properties using sensors	X	X						
	3.6: Implement fleet energy management across all vehicles and actively monitor the impact of improvements and sustainability initiatives.	X	X						
	3.7: Test & Deploy Smart Parking initiatives (e.g. parking sensors in Wine St car park, and Parking App to pre-book spaces)	X	X						
	3.8: Evaluate linking business rates to carbon footprint.		X						
	3.9: Increase internal Council use of digital technologies for meetings to reduce cost, travel time and carbon footprint (e.g. Zoom video conferencing, Google hangouts etc.)	X	X						

Table 11 Delivering Digital Services

iv. Fostering Innovation, Enterprise, Digital Economy & Employment

Thematic area	Initiative	Impact Smart	Impact Green	Owner	Success Measure	Timescale 2020	2021	2022	2022
4. Fostering Innovation, Enterprise, Digital Economy & Employment	4.1: Create a Startup Friendly culture promoted and supported by the Council (e.g. Digital/Smart challenges with awards and contracts, Open data access, Council willing to work with startups)	X	X						
	4.2: Promote Sligo as a Startup friendly region nationally & Internationally.								
	4.3: Promote Sligo as second centre for multi nationals and large Irish companies.								
	4.4: Actively create links with new and former graduates to promote the region as an option for employment.								
	4.5: Increase links with IT Sligo, Enterprise Ireland and others to pose challenges for research & startup innovation.								
	4.6: Declare and promote Sligo as a 'living lab' region.	X	X						
	4.7: Nominate and promote the region as a centre for one of more aspects of digital technologies (e.g Data/Analytics or Mobility etc)	X							

Table 12 Fostering Innovation & Enterprise

v. Enabling Actions 1: Be an ethical innovator in the information marketplace:

	Actions	Impact Smart	Impact Green	Owner	Success Measure	Timescale 2020	2021	2022	2022
BE AN ETHICAL INNOVATOR IN THE INFORMATION MARKETPLACE	5.1: Develop the Open Data initiative into a full Platform	X							
	5.2: Build ethically a new Information Marketplace, meeting privacy expectations and encouraging understanding of emerging security issues	X							
	5.3: Influence the provision of digital infrustructure for the prioirity underserved and isolated areas across the region	X							
	5.4: Expand current initiatives and creatively use data and city analytics to improve the performance and operation of the region	X							
	5.5: Develop a framework for assessing and prioritising 'smart city' opportunities in an ethical and Green manner	X	X						

Table 13 Ethical Innovation in the Information Marketplace

vi. Enabling Actions 2: What does the Council and its workforce need to do:

	Actions	Impact Smart	Impact Green	Owner	Success Measure	Timescale 2020	2021	2022	2022
WHAT DOES THE COUNCIL AND ITS WORKFORCE NEED TO DO?	6.1: Implement mobile & flexible workforce strategy	X	X						
	6.2: Address digital skills shortages, manage digital change: achieve greater productivity and improved performance with fewer or similar resources.	X	X						
	6.3: Create a Digital Development Function	X							
	6.4: Ensure that Smart and Green considerations are applied to every initiative at inception and prior to completion	X	X						
	6.5: Actively promote digital communications internally and extrenally with all stakeholders, and publically endorse Sligo County Council as a leader in smarter working.	X							

Table 14 Adapting the Council workforce

vii. Enabling action 3: Effectively facilitate partnerships to maximise benefits

	Actions	Impact Smart	Impact Green	Owner	Success Measure	Timescale 2020	2021	2022	2022
EFFECTIVELY FACILITATE PARTNERSHIPS TO MAXIMISE BENEFITS	7.1: Establish internal champions working group								
	7.2: Establish an external stakeholder relationship working group								
	7.3: Enable procurement of solutions from innovative startups	X	X						
	7.4: Publish challenges to the region's problems and invite innovative solutions from all sources								
	7.5: Liaise with academic institutions locally, nationally and internationally to push research areas								

Table 15 Effective Partnerships

APPENDIX I – DIGITAL READINESS ASSESSMENT UPDATE Q1 2020

During the strategic consultation process an analysis was conducted into the needs of the various stakeholders, a gap analysis of the current infrastructure status was prepared and a summary table of the plans to address these needs prepared.

i. Stakeholders requirements analysis

During the consultation process all stakeholders were interviewed and their digital infrastructure needs were described. All stakeholders identified broadband to the home and good 4G & 5G coverage as important, while various stakeholders had specific needs, such as town broadband and Wi-Fi in public places.

	Stakeholder Needs							Status Feb 2020		
Infrastructure	Individ-uals	Micro Business	SME's	Large Business	Educat-ion	Health Care	Public Bodies	2020	Status update from discussion with Sligo ICT team	Est %
Broadband to home	X	X	X	X	X	X	X		National boardband rollout commenced, Sligo CC actively supporting and enabling the regional deployment during 2020, 2021 and 2022	66%
Town Broadband		X	X	X			X		Good broadband to most of Sligo Town, shared ducting will make it easy to futureproof. Other towns less well served.	75%
Shared ducting in streets		X	X	X			X		Program underway, O'Connell St almost complete, and any new this is a standard part of all new roads projects	50%
Shared ducting to door	X			X					Planned for the new development in Cranmore. Needs to be part of all future plans	20%
WiFi in public places	X	X			X				Some public WiFi in Sligo Town, rollout of WiFi4EU to start mid 2020 to provide public WiFi in 60 additional locations.	33%
4G & 5G coverage	X	X	X	X	X	X	X		Reasonable mobile coverage in significant parts of the region, however a few areas have poor or limited coverage, particularly rural areas.	75%

Figure 35 Stakeholder Digital Infrastructure Needs & Status update Feb 2020

ii. Stakeholder digital Infrastructure gap analysis

The needs of the various stakeholders are clear, however, these are currently being served to different degrees. The following graphic provides a visual representation of the progress and current status as discussed in February 2020.

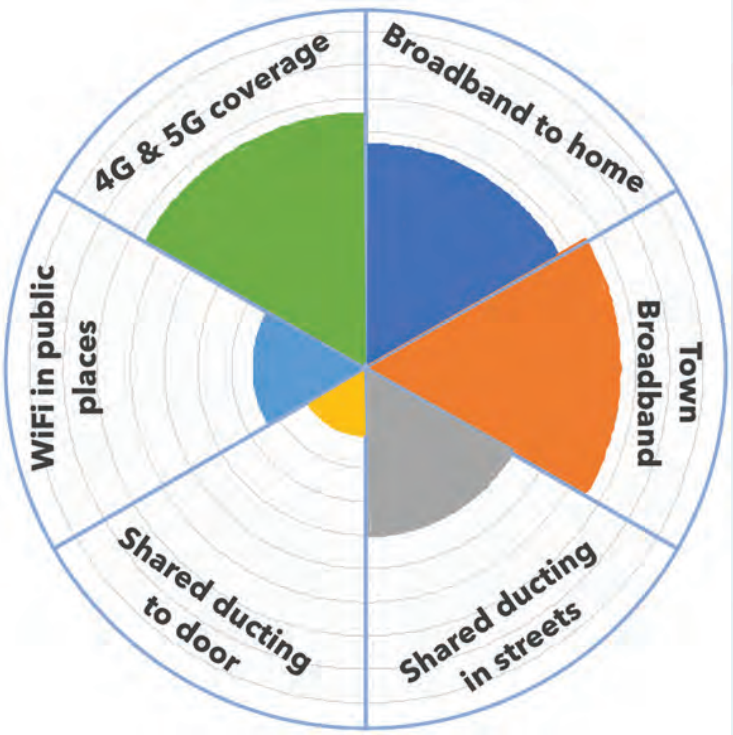


Figure 36 Stakeholder Digital Infrastructure gap analysis & status

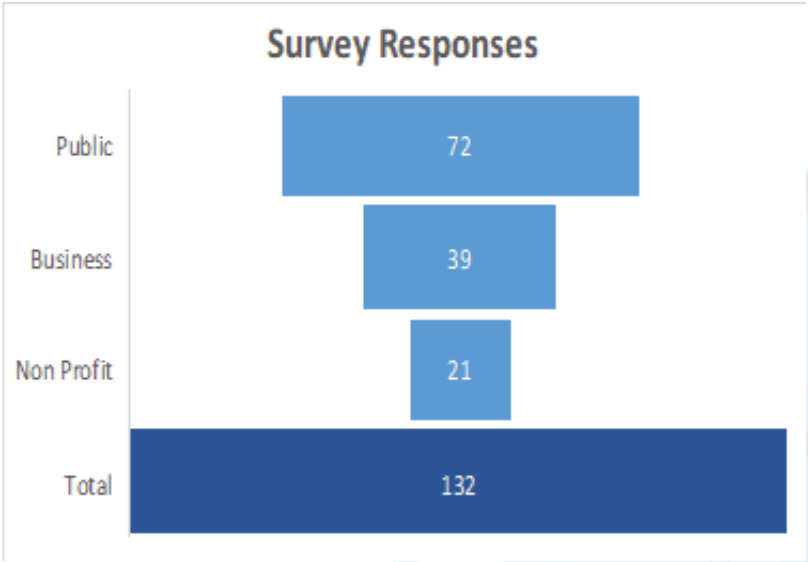
iii. Current digital infrastructure plans

Infrastructure	Current Status & Plans
Broadband to home	National broadband rollout commenced, Sligo CC actively supporting and enabling the regional deployment during 2020, 2021 and 2022.
Town Broadband	Good broadband to most of Sligo Town, shared ducting will make it easy to futureproof. Other towns less well served.
Shared ducting in streets	Program underway, O'Connell St almost complete, and this is a standard part of all new roads projects.
Shared ducting to door	Planned for the new development in Cranmore.
Wi-Fi in public places	Some public Wi-Fi in Sligo Town, rollout of WiFi4EU to start mid 2020 to provide public Wi-Fi with up to 60 additional locations.
4G & 5G coverage	Reasonable mobile coverage in significant parts of the region, however a few areas have poor or limited coverage, particularly rural areas.

Table 16 Status of digital infrastructure plans

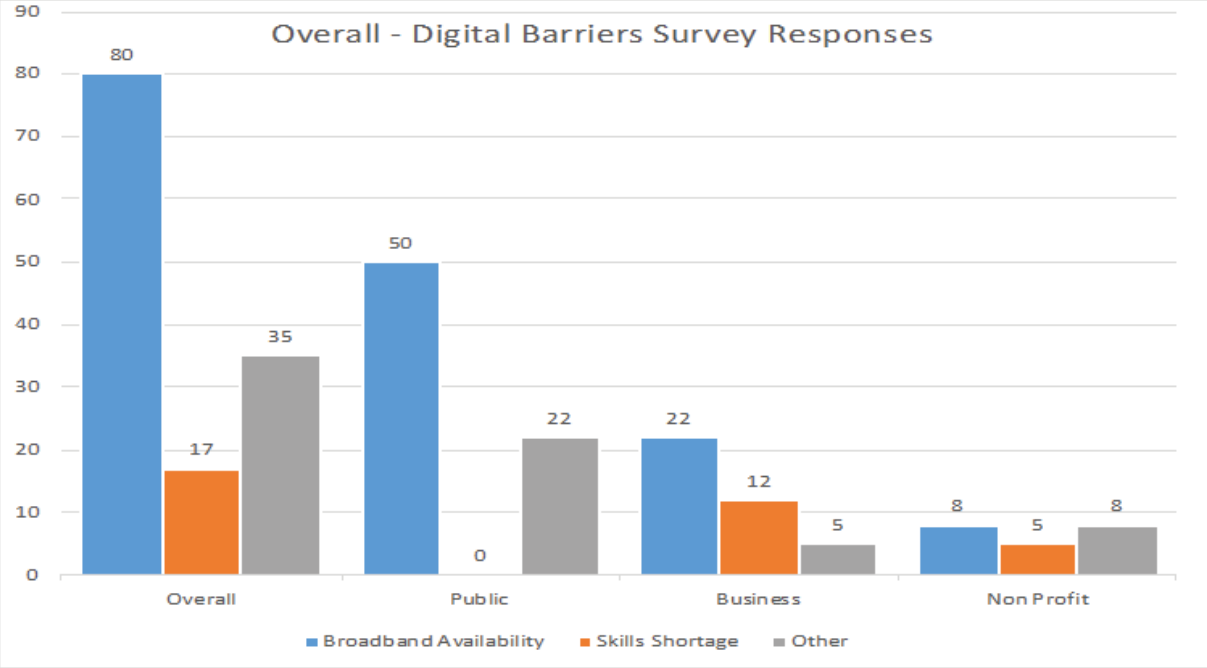
iv. Results of Digital Barriers Survey August 2020

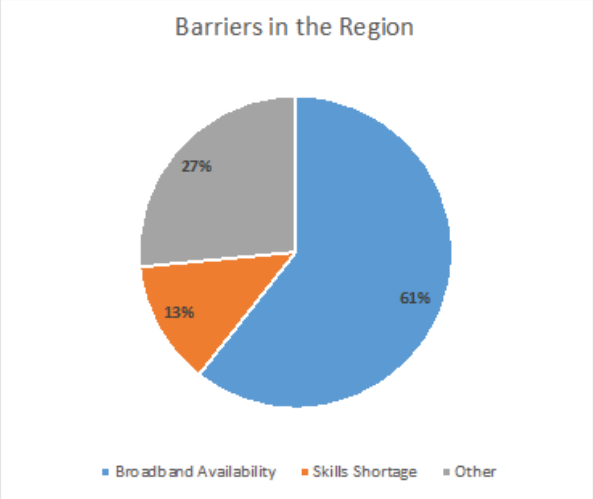
During July and August 2020 an online survey was carried out across the region. Surveys were sent to members of the public, regional businesses including small, medium and large enterprises, and to non-profit organisations that included academic, health, community and voluntary groups among others. There were 132 completed responses and these have been analysed. The main findings that can be seen from the data are:

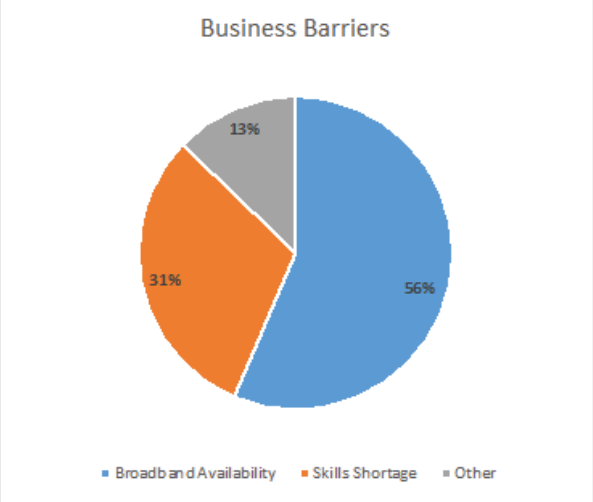


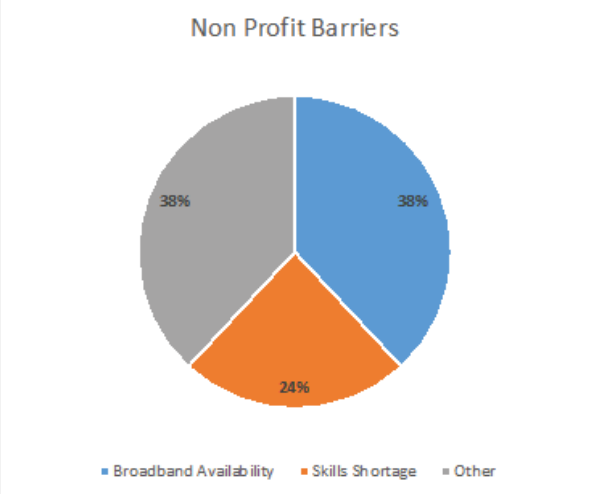
- Overall 61% of the respondents cited availability of broadband as the major barrier to digital adoption.
    - o This increased 69% among members of the public.

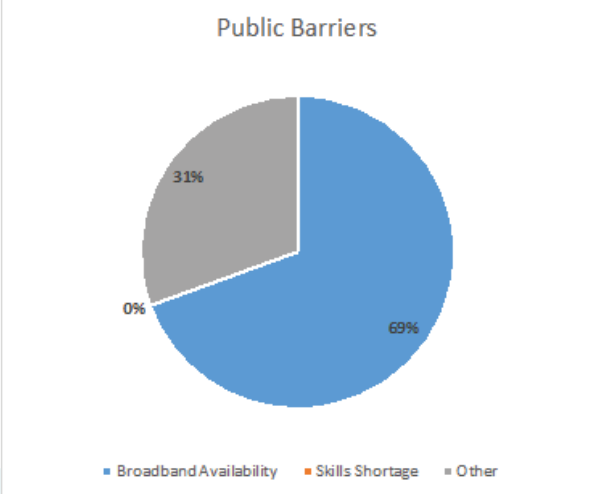
- 31% of businesses cites a shortage of available digital skills in the region as a barrier to growth
    - o This was also supported by almost a quarter (24%) of non-profit organisations.


Overall - Digital Barriers Survey Responses
90
80
70
60
50
40
30
20
10
0
80
17
35
50
0
22
22
12
5
8
5
8
Overall
Public
Business
Non Profit
Broadband Availability
Skills Shortage
Other


Barriers in the Region
27%
13%
61%
Broadband Availability
Skills Shortage
Other


Business Barriers
13%
31%
56%
Broadband Availability
Skills Shortage
Other


Non Profit Barriers
38%
38%
24%
Broadband Availability
Skills Shortage
Other


Public Barriers
31%
0%
69%
Broadband Availability
Skills Shortage
Other

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SLIGO

COUNTY COUNCIL

COMHAIRLE CHONTAE SHLIGIGH