Towards a Smart Southern Region

SMART REGION FRAMEWORK FOR THE SOUTHERN REGIONAL ASSEMBLY

Report 3: Smart Region Maturity Framework for the Southern Region

Tionól Réigiúnach an Deiscirt
Southern Regional Assembly

Smart Region Framework
For the Southern Regional Assembly

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Abbreviations

AI	Artificial Intelligence
AISCF	All Ireland Smart Cities Forum
CDPs	County Development Plans
ERDF	European Regional Development Fund
EU	European Union
GIS	Geographic Information Systems
HEI	Higher Education Authority
ICC	Intelligent Cities Challenge
ICLRD	International Centre for Local and Regional Development
ICT	Information and Communications Technology
IoT	Internet of Things
KPI	Key Performance Indicator
LA	Local Authority
LDIF	Limerick Digital Innovation Forum
LECP	Local Economic and Community Plan
ML	Machine Learning
MU	Maynooth University
NTA	National Transport Authority
R&I	Research and Innovation
RPO	Regional Policy Objective
RSES	Regional Spatial and Economic Strategy
S3	Smart Specialisation Strategy
SBIR	Small Business Innovation Research
SDGs	Sustainable Development Goals
SEAI	Sustainable Energy Authority of Ireland
SMT	Smart Mapping Tool
SRA	Southern Regional Assembly
SSR	Smart Southern Region
WP	Work Package

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THINK
ABOUT
THINGS
DIFFERENTLY

Chapter 1: Introduction

There is a growing recognition of the value in expanding the concept of 'smart places' beyond the realm of the city to include a broader regional dimension. While the narrative surrounding smart regions is still evolving, case studies to date (see Report 2 in this series) highlight the importance of any smart region framework being firmly embedded in 'place' and having a strong territorial grounding. More often than not, the emergence of a smart region framework is strongly shaped and informed by the presence of smart cities and the key priorities they address through a 'smart' programme. As the economic, social and environmental ecosystems of metropolitan urban areas come under cumulative stress, technology is increasingly being used as a solution to these issues and their impact on 'place'.

Global trends such as urbanisation[1], climate change, biodiversity loss, digitalisation, mobility and changing demographics are dramatically transforming society, presenting both socio-economic and environmental challenges. At the level of the city, these challenges "include a rapid and rampant process of economic growth and restructuring that often leaves some places as 'winners' and others as 'losers', the continuing pressures of urbanisation and demographic change, the call for the development of sustainable forms of urban transportation and infrastructure, the need to provide more secure and affordable homes, and the rising tide of local accountability as communities seek greater involvement and participation in local decision-making" (Strange, 2018: 13). The impact of such trends also has implications for sustainable and effective regional development as promoted, in the case of Ireland, through the National Planning Framework (NPF) – *Ireland 2040*, and the three Regional Spatial and Economic strategies (RSES) of the Regional Assemblies. In order to become more stable and sustainable, there is a growing need to adopt local and regional solutions to these global challenges.

The concept of a smart city, and increasingly a smart region, has become intertwined with that of sustainable development, with digitalisation, big data and Internet of Things (IoT) playing a strong role (Joshi *et al*, 2016). This is encapsulated within the United Nations Sustainable Development Goals (SDGs) where Goal 11 focuses on "Make cities inclusive, safe, resilient and sustainable". Over the past decade, the concept of "smart" has evolved to mean sustainable and liveable places (Joshi *et al*, 2016). A McKinsey Global Institute Report published in 2018 argues that "As cities get smarter, they are becoming more liveable and more responsive", with municipal leaders realising "that smart-city strategies start with people, not technology" (Woetzel *et al*, 2018).

As smart cities enter this new phase of thinking, it is timely to begin thinking about – and planning for – smart regions. While what we know about smart regions is largely based upon our understanding of smart cities, the evolving nature of the underpinning principles of smart cities to include place-making, quality of life, liveability, and citizen engagement ensure that future strategies for smart regions will be based on smart sustainable policies and integrated decision-making with a variety of stakeholders.

1 The 21st Century is already being defined as the urban age (Soja and Kanai, 2010). In 2018, it was estimated that 55% of the world's population lived in urban areas; by 2050, this is expected to increase to 68% (UN DESA, 2018) and by 2100 to 85% (European Commission, 2019).

1.1. Purpose of Report

In March 2021, Maynooth University (MU) together with its research partner, the International Centre for Local and Regional Development (ICLRD) were appointed by the Southern Regional Assembly (SRA) to provide a smart region definition and framework to facilitate smart cities driving a smart region. GIS expertise was provided by Limerick City and County Council (see Annex 1 for research team details). The Southern Regional Assembly is committed to developing a region that is economically strong, inclusive, connected, climate-resilient and sustainable and, as part of this work programme will consider the role of smart initiatives in contributing to this vision. In the context of the rest of Ireland, the Southern Region represents over 40% of Ireland's total landmass and one third of the national population. With three of the country's five cities - Cork, Limerick and Waterford and a network of large towns, the region has a strong urban structure.

The Southern Region, made up on ten local authority areas (see Figure 1.1), has a strong established baseline in smart city initiatives – drawing on innovations in the metropolitan areas of Waterford, Cork and Limerick. Extending these initiatives to the Region's towns, villages and rural areas is key to building the smart region.

A core objective of the RSES adopted in January 2020 is to enable the sustainable, inclusive and resilient growth of the Southern Region. It recognises that smart specialisation, as one component, is a pathway to smart cities – and by extension, that smart regions are competitive, innovative and productive regional economies. Key to achieving this vision is for all locations, urban and rural, to collaborate on smart region initiatives. Within the RSES, Regional Policy Objective (RPO) 134, focuses on Smart Cities and Smart Region,

> *"seeks to build on Smart Cities and Smart Region Initiatives in Cork, Limerick and Waterford, such as the All Ireland Smart Cities Forum, and seek to extend such initiatives to towns, villages and rural areas to support a Smart Region (SRA, 2020: 157).*

In addition to supporting the SRA in the delivery of its regional priorities, this research programme also contributes to the Interreg Europe-funded COHES3ION Project[1]. This inter-regional project, to which SRA is a partner, is focused on improving the performance and impact in terms of delivery of innovation by Research and Innovation (R&I) actors of Smart Specialisation Strategy (S3) and linked European Regional Development Fund (ERDF) Regional Operational Programmes. Of particular relevance to this work programme is COHES3ION's focus on the identification of smart priorities – those complementarities and synergies between different levels of territory, in terms of priority or niche opportunities, allowing for further specialisation of specific territories.

Figure 1.1. The Southern Regional Assembly Area

(Source: http://www.southernassembly.ie/the-assembly, accessed 12 June 2021).

A key focus of the new Territorial Cohesion Programme (2021-27) is 'A Smarter Europe' with a strong emphasis on innovative, digitalisation & smart economic transformation building on place-based strengths & potentials. This requires a strengthened interconnectedness between regional socio-economic development, environmental management and spatial planning practice and policy. There is a growing recognition that every type of region is facing an industrial transition[2] – as a result of global megatrends such as changes to traditional manufacturing, digitalisation and technological advancements, climate change and, more recently, COVID-19 and its impact on retail trends – and thus have distinct needs.

Meeting these needs over the next decade will require regional adjustments, the adoption of a place-based approach to innovation-led growth and development and greater collaboration via the quadruple helix model or, as referred to in the RSES, Eolas Comhroinnte Obair le Cheile

2 Industrial transition is not a new phenomenon. As outlined by the OECD (2019), the catalyst for each transition has been different, ranging from steam in the first industrial transition, to transport and electricity in the second, computers, semiconductors and the Internet in the third, and finally to artificial intelligence (AI) and machine learning (ML) in today's fourth industrial transition.

/ Shared Knowledge Working Together[3]. The Quadruple Helix model involves a collaborative partnership between academia, community, public agencies, and the private sector to harness local and regional opportunities and endogenous assets in a smart and sustainable manner that not only diversifies the local/regional asset base and nurtures industry and technology clusters, but which also creates places that are adaptable with a strong transversal skills-base (Creamer, Connolly & Riveria, 2021).

At the core of the output of this research programme is (a) defining a smart region generally, and as it applies to the SR, and (b) the development of a smart region maturity framework. Together, this will enable the region, and its sub-regions, to:

1. Understand what a smart region is;
2. Describe their own level of maturity;
3. Set plans for improvement; and
4. Measure improvement.

1.2. Defining Smart Regions

As outlined in Report 1 of this series, Smart Region Consultation, there is no unique definition of a smart region. Smart regions, as a concept, play a key role in developing new growth dynamics based on bottom-up entrepreneurship and innovation. The rapid development of digital technologies is resulting in terms such as 'smart cities', 'smart society' and 'smart regions' becoming more and more popular in the modern changing world (Bauer et al, 2019). As contended by Ó Brolcháin et al, "Smart regions are the logical extension of the smart city concept" (2018: 1); recognising that cities do not exist in isolation and that for a region to become 'smarter' it needs to consider the opportunities, benefits and challenges that smart technologies can offer. Increasingly, such regions are a mechanism for improving the spatial interlinkages between urban and rural areas and demonstrating the potential of rapidly evolving technologies to positively transform societies in priority areas such as energy transition, digital growth, circular economy, agri-food, or industrial modernisation. At their core is a smart city with a key role to play in both enabling and driving a smart region.

For the purposes of this work programme, a general definition of a smart region proposed by Matern et al was tabled. Highlighting the complexity of a smart region, it argues that cities cannot be examined in isolation of their diverse surrounds and that the transition from a region to a smart region is enabled by societal innovation, whereby diverse urban-rural areas

> *"are spatially reframed by digital technologies and the respective social practices in a variety of fields (citizenship, governance, economy, environment, mobility, infrastructure) on a discursive, implemental and regulative level. The concept of smart regions follows a relational and social constructivist understanding of spaces and emphasises an integrated approach towards the social (re)construction of smart regions by actors and their networks (2020: 2064).*

The value of this as a general working definition, and a starting point for defining a smart region as it applies to the Southern Region, is that while it acknowledges the driving role played by cities in the evolution of smart places, it recognises the diversity of actors involved, the wide range of themes that can be involved, the inter-play between technology, society and culture, and that innovation and 'smartness' can also emanate from rural areas and the entrepreneurialism of community.

3 Eolas Comhroinnte Obair le Cheile / Shared Knowledge Working Together is defined within the RSES of the Southern Regional Assembly as "the collective regional approach to development of a competitive knowledge-based society where a framework of the four pillars of higher education, industry, government and civic society work together to harness their collective resources, knowledge and skills" (2020: 196).

1.2.1. Defining a Smart Southern Region

In defining a smart region as it would apply to the Southern Region, the analysis of literature, policy and perspectives shared by a range of regional stakeholders – as captured in Report 1 – clearly illustrates that an emphasis must be placed on; namely: (1) place and place-making; (2) people via engagement and subsidiarity; (3) collaboration and co-design; (4) connectedness of infrastructure and policy in support of sustainability and quality of life; (5) data, technology and innovation in support of resilience; and (6) good governance (see Figure 1.2.).

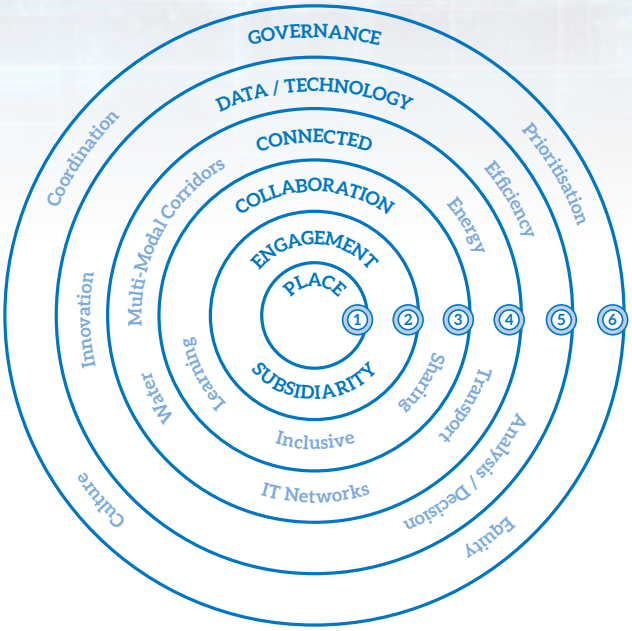
What is most significant about this emerging model is the focus on 'place' and the widely held belief that any smart region must be grounded in a geographic or territorial context, with the core objective of improving quality of life and liveability of place using a sustainable and citizen-centric approach. Technology and digitisation, in its many forms, is a tool – and enabler – in achieving these goals; and should only be deployed (either in pilot or mainstream) in this context where the value added has been both researched and developed.

An initial bespoke smart region definition for a Smart Southern Region was presented at the end of Report 1 and carried forward in Report 2; namely:

> *A smart region working in collaboration, leveraging technology and open data, to co-create vibrant, sustainable and liveable cities, towns and communities.*

This emerging definition is further reflected upon in Chapter 5.

Figure 1.2. The Key Dimensions of a Smart Region for the Southern Region of Ireland



(Source: Authors – Maynooth University and ICLRD)

1.3. Report Methodology

A three-phase methodology was adopted to deliver this programme of work, incorporating both primary and secondary research.

1

Work Package (WP) 1 – Smart Region Consultation (leading to Report 1)

This work package involved a mixed methods approach, utilising both primary and secondary/desk-based research. Via semi-structured interviews, a broad range of regional stakeholders were consulted on what constitutes a smart region, and current initiatives under way that would lend to future branding of the Southern Region as a smart region. Interviewees included representatives of Local Government, Higher and Further Education Bodies (incl. research centres), business/industry representative bodies, semi-state bodies and community groups. This WP also included the identification and review of smart initiatives and actions at various scales across the region's Local Authorities – drawing from resources such as the emerging digital strategies, European Union (EU) programmes such as the EU's Intelligent Cities Challenge (ICC) in which Cork City was a recent successful applicant, third level smart innovation programmes, and initiatives supported under the Smart Towns and Villages programmes at an EU and national level. The identification and analysis of smart initiatives will be undertaken using the key concepts of the smart city as outlined in Figure 1.3.

2

Work Package (WP) 2 – Smart Regions Good Practice Research (leading to Report 2)

This work package considered the workings of different smart regions in practice; with a particular focus being placed on governance arrangements, stakeholders involved, thematic focus, and its place-based impacts. Examples of smart regions across Europe and elsewhere to be considered as part of this phase were identified via the interviews as part of WP 1, and through an international literature review.

The resulting report focused on the following smart regions:

- **Netherlands:** The Metropolitan Region Rotterdam and The Hague (MRDH) and Eindhoven 'Brainport';
- **Finland:** The 6 Aika Strategy and the Helsinki-Uusimaa Region;
- **USA:** The Greater Phoenix Smart Region;
- **Germany:** Smart Baden-Württemberg; and
- **Wales:** The Cardiff Capital Region.

Figure 1.3. Smart City Concepts
(Source: RSES for the Southern Region, 2020: 156).

3

Work Package 3 – A Framework Report to Assist Stakeholder Initiatives in Pursuit of a Smart Region (the main intent of this report)

Building on the findings and key learnings from WP 1 and 2, this package and resulting report defines what a smart region is in the context of the Southern Region, and the core principles both underpinning and nurturing its growth. At the core of this work package was the development of a Smart Region Maturity Framework which not only informs the next steps of the SRA in progressing the smart region concept but supports all regional stakeholders in: (1) Understanding what a smart region is; (2) Describing their own level of maturity; (3) Setting plans for improvement; and (4) Measuring improvement. The methodology employed and resulting maturity model are outlined in Chapters 3 and 4.

A second core component of this WP was to develop a baseline Smart Mapping Tool, a cloud-based tool that will capture smart activity across the region. With the support of Limerick City and County Council, the research team captured the details of a number of diverse smart activities and mapped these. Every effort was made to align these to the SRA's strategic regional priorities. Over time, there is the potential to add images, videos, and PDFs to this tool to improve its interactivity. The intention is to embed the smart mapping tool on the SRA website – thus providing the public and regional stakeholders with a means to interactively track the progress of smart initiatives across the region. All data collected by the smart mapping tool can also be exported in a variety of formats at any stage for use in SRA internal GIS systems or shared with other organisations.

Across the three core Work Packages, consideration will be given to what are the key issues generally impacting the success of delivery of a smart region, and more specifically the Southern Region achieving its objective of becoming a smart region.

1.4. This Report

This document represents Report 3 – *Smart Region Maturity Framework for the Southern Region*. It describes the development of a smart region maturity model for the Southern Region. As a tool, the maturity model enables measurement of the region's 'smart' competency level at a point in time, and it provides the basis for planning to improve competency levels – thus strengthening the region's overall goal of becoming a 'smart region'. In this instance, the competencies are those outlined in the co-created Smart Region Framework, as presented in Report 1, namely: place, participation and subsidiarity, collaboration, infrastructure, technology and governance (see Figure 1.2. above, and Chapter 2 for a recap on the Framework).

The intent of the maturity model is to build an understanding of the level of 'smartness" within the region, and to initiate activity to increase this level of 'smartness.'

'Smartness' refers to the level of participation by all relevant stakeholders and advocates for the use of digitalisation and technology to enable the realisation of a Smart Southern Region (SSR). It is important to underpin that 'smartness' is an enabler of greater goals – and not a goal in itself. During the development of the Framework, the overwhelming opinion of those who contributed is that the foundation for the SSR must be built upon a 'sense of place' and a stronger regional 'identity'; with any smart region programme being firmly embedded in regional place-making policy and practice. As such, the Framework and associated maturity model must offer a high quality of life with, in the current climate, a specific focus on housing, transport and access to amenities. It must embrace high quality designed public realm, culture and creative offerings, lifelong learning and networking possibilities, and recreational options. Never has this been more important than now when peoples' homes and their immediate surrounds have, for so many, also become their place of work. As noted by the OECD (2019), preparing for the future of work in regions in industrial transition requires a place-based approach that "combines skills and employment policies with those that stimulate investment in new sources of employment and productivity growth" (p.6). This is not only requiring regions to think outside the box, and "adopt an integrated territorial approach to well-being, balancing the divides between emerging and strong local innovation hubs and declining communities within a region" (OECD, 2019, p.9) but also to align future development to solving global challenges as they relate to, for example, climate change, renewable energies, food security and changing demographics.

The SSR will not happen by osmosis. As demonstrated by international examples of smart regions in practice (see Report 2), they require a single agency – existing or specifically established – to implement a roadmap, codesigned by key regional stakeholders. Critically, the Framework for the SSR as outlined is already strongly aligned to the three thematic pillars adopted by the SRA as part of the RSES process, namely:

- A Green Region;
- A Liveable Region; and
- A Creative and Innovation Region.

This alignment places the SRA as the most suitable candidate to oversee the implementation of a Smart Southern Region, providing a light-touch regional governance structure that will promote shared goals, will facilitate local/regional decision-making and will support a fair and inclusive transition.

CHAPTER 2: SMART REGION FRAMEWORK

This section summarises the Smart Region Framework previously submitted to the SRA (see Report 1 in this series – *Smart Region Consultation*). The Framework was developed from 41 interviews with a range of stakeholders from across the Southern Region, including representatives from local government departments, higher and further education, local elected representatives, the community sector and the enterprise sector. The Framework, described in Figure 1.2, is centred on place, liveability and associated high quality of life. It recognises that key elements of a smart region should include strong social cohesion as a result of active participation and collaboration, connected communities – with a focus on mobility, environment, creativity and wellbeing, technology and digitalisation as a tool in the solution of regional/local challenges, and strong governance based on the quadruple helix.

Prior to considering the smart maturity model for the Southern Region, it is important to recap on the main components of the Framework, noting it radiates from the centre outwards in six core layers[4]:

Place-Making (Layer 1)

The overwhelming opinion of those interviewed is that a smart region must have a sense of place and identity. It must offer a high quality of life – that goes beyond the working environment to include housing, transport and access to amenities. It includes high quality designed public realm, culture and creative offerings, lifelong learning possibilities, and recreational options.

Engagement and Subsidiarity (Layer 2)

There was an understanding from the interviewees that engagement is a fundamental pillar of a smart region. This reflects the belief that initiatives will be better served with stakeholder input to decision making – the quadruple helix (or Eolas Comhroinnte Obair le Cheile / Shared Knowledge Working Together) of meaningful collaboration between state bodies, public institutions, citizens, academia and private organisations.

Subsidiarity was also viewed as fundamental, whereby decision-making powers on public policy rest as close as possible to where those policies are being delivered and embedded. The success or not of a smart region is for many linked to the degree of autonomy or mandate to make decisions that exists within the region.

Collaboration (Layer 3)

This reflects the general agreement that many benefits could accrue from working within a regional structure. The prevailing attitude is that the development of a smart region must benefit all, and that a regional effort offers a higher potential in bringing people (stakeholders) together, and it will be at its most successful when very strong relationships are in place. As outlined in Report 1, there is currently, as would be expected, significant collaborations between local authorities and other agencies; with this being based on practical projects where there is an obvious and mutual gain for all involved – for example, tourism, water treatment, energy, and environmental management.

4 For a more detailed overview of this Framework, and its six constituent layers, see Report 1 (Chapter 5) as part of this work programme.

Connected(Layer 4)

This reflects the need for smart regions to be connected spaces, bringing together urban and rural areas to play to their respective strengths and remove any sense of peripherality or of being a 'lagging' region. Such connected spaces must have a strong infrastructural base in place upon which to build services, such as Information and Communications Technology (ICT), multi-modal corridors and transport, water, waste and energy.

Technology and Data (Layer 5)

A fundamental of 'smart' is the power of technology and data. Technology is viewed as an enabler. Through data collection, collation, analysis and visualisation, it is the basis for evidence-based problem solving and innovation.

Smart Region Governance(Layer 6)

Governance refers to the mechanisms that will need to be put in place to ensure direction, alignment, control, and coordination in the design and development of a smart region. As a layer critical to the success of building a smart region, there is a requirement for a single agency to take a lead role in driving the initiative forward. How light-touch such governance arrangements are will depend on the scale of ambition being promoted. As a regional initiative that is already a policy objective of the RSES, a natural 'home' for the SSR initiative is within the SRA.

CHAPTER 3: A SMART REGION MATURITY MODEL - METHODOLOGY

A maturity model is a mechanism to define competency levels in a given domain. It allows measurement of an individual organisation's competency level – or, in this case, a region's competency level, and it provides the base level from which to plan for improvement of those competency levels.

The competency domains in this model are taken directly from the bespoke Smart Region Framework described in Chapter 2; with these domains acting as the building blocks for the Southern Region's maturity model. This was completed in three stages:

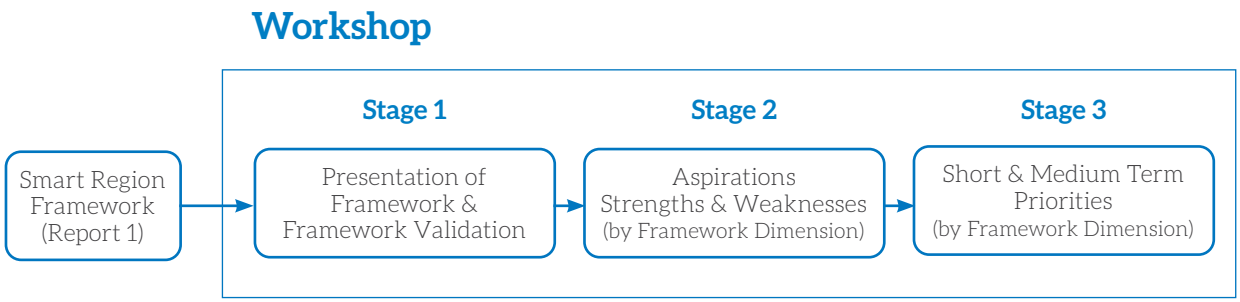
1. A facilitated workshop, designed to gather data which informed the phases of maturity in the Southern Region;
2. Subsequent analysis and synthesis of the data gathered, where phases could be described and presented; and
3. The development of a medium-term implementation strategy.

3.1. The Workshop

The intent of the workshop was to gather data to inform the development of a smart region maturity model. The workshop followed a structure (see Figure 3.1.) of

1. Presentation of the Smart Region Framework;
2. Facilitated session to elicit feedback on the Framework; and
3. Facilitated break-out groups to focus on the Framework elements.

Figure 3.1. Workshop on a Smart Region Maturity Model for the Southern Region



(Source: Authors)

The facilitated online workshop took place on the morning of 1st July 2021 using MS Teams[5]. Those attending were drawn from the same stakeholder groups that were interviewed as part of the first Work Package (WP) of this research programme (focused on defining a smart region and informing a smart region framework). After an initial presentation of the Framework, the attendees were given the opportunity to critique the model and to offer proposals for change. All feedback has subsequently been built into the Framework[6].

The attendees were then broken into four working groups (or breakout sessions), each focusing on an element of the Framework; these being:

- Participation, including subsidiarity and collaboration;
- Connect – infrastructure;
- Data and Technology; and
- Governance.

In a facilitated breakout session for each of the associated priorities, attendees used the MURAL online collaboration tool to visually engage and problem-solve together in real-time. Through this online whiteboard, the attendees identified:

- Aspirational characteristics and descriptions;
- Strengths and weakness within the region; and
- Immediate priorities.

In a second session, the group identified challenges with each of the priorities, and defined short- and medium-term implementation goals.

3.2. Analysis and Syntheses

The workshop intent was to gather data to inform the development of a smart region maturity model. The model development is described in Chapter 4. The data gathered also pointed to a medium-term implementation proposal, and this, in turn, is described in Chapter 5.

5 *The workshop was held online in response to coronavirus public health guidelines.*

6 *The Framework as presented in Figure 1.2. is reflective of feedback received during the course of this workshop.*

CHAPTER 4: THE MATURITY MODEL

4.1. Smart Southern Region Maturity Model Content

In line with best practice, the maturity model was developed over four maturity levels:

Level 1. Ad hoc: representing discrete, unrelated local activity with no plans for scaling or sharing of learnings. Local is deemed to be at a city, town or community level.

Level 2. Improving / Planned: representing a low level of strategising and medium-term planning at a local level. This would be evidenced by geographical sub-regions strategies (e.g., cities), and domain specific collaboration between sub-regions.

Level 3. Maturing / Coordinated: representing a high level of coordination of 'smart' activity within the region and a high level of collaboration within the region.

Level 4. Mature / Region Wide: representing an integrated and region-wide adoption of smart concepts, enabling the RSES goals and policy objectives. This would be evidenced by an integrated region-wide smart strategy with oversight.

A summary of the output in maturity model form is depicted in Table 4.1. The tables in Annex 2 provide a more complete description of the workshop output. The descriptions are taken directly from the discussion and opinions articulated by the workshop's attendees, with examples of current activity.

Table 4.1. states, for example, that with respect to **Data and Technology**, the current ad-hoc situation is that there are many good projects in the region. However, in general the workshop participants believe that

- There is a low level of communications and sharing of projects within and across the region;
- There are low levels on higher educational institute involvement; and
- Local authorities are quite slow to adapt new technology.

The participants believe that to mature to the next phase (level 2 – Improving/Planned) would entail (a) increasing the awareness of local authority staff on the potential of new technology; (b) gaining a greater commitment from local authority management around specific goals; and (c) adopting a bounded (boundary spanning) thematic-focused effort[7].

7 This includes on a cross-administrative basis between local authorities in the region.

Taking this a step further and maturing to level 3 (Maturing/Coordination), the participants would expect to observe

- KPIs;
- Accessible dashboards where relevant data can be viewed;
- High data reliability;
- Projects chosen based on data evidence;
- More technology literate citizens; and
- A much higher level of communications on objectives, vision and engagement.

The participants would expect to observe, in a mature smart region, a significant level of technology enabled services; the funding to sustain and improve services; a high level of optimising data; and smart region planning being part of the senior management responsibility.

Table 4.1. A Smart Region Maturity Matrix for the Southern Region

Maturity	Participation, Subsidiarity and Collaboration	Connect Infrastructure	Data & Technology	Governance
LEVEL ONE 1 Ad Hoc LEVEL ONE	Trust; Inclusive; Wide participation - quadruple helix; Regcognition for, and exploitation of, region wide expertise	Enabling infrastructure in place; Evidence based planning; 10/15 minute town capable	Ubiquitous technology enabled public services; Data driven solutions; Long term funding; Open data enabled smart planning @director	Balance between central control and regional coordination; Robust vision; Specific mission oriented objectives
LEVEL TWO 2 Improving/ Planned LEVEL TWO	Smaller stakeholder group participation; Engagement strategy; Full use of PPNs & HEIs; Participation actions documented	Infrastructure (broadband, waste, water, etc.) to match population growth; Evidence of funding & deliver programmes	(KPI's) in place; Data driven services; Centralised dashboards; Open data audits; Data savvy citizens; Community comms	Funding sources identified; One (or more) regional projects with wide impact; Technology enabled participation
LEVEL THREE 3 Maturing/ Coordinated LEVEL THREE	Participation strategy; Wide consultation process; Sub-region collaboration; Central government support	Regional cross-domain planning; Regional rollout of 10-minute town; Evidence of regional wide technology implement	LA staff aware of smart vision, strategy and impact; LA commitment; Thematic specific focus groups	Stakeholder map in place; SWOT analysis complete; Dedicated resources;LA working groups; Evidence of sub-regional planning
LEVEL FOUR 4 Mature/ Wider Region LEVEL FOUR	Stakeholders act independently; Limited stakeholder inclusion; Discreet projects	Lack of access to funding; Lack of real time data; Immature infrastructure; Poor broadband; Discrete projects	Low levels of sharing; Low levels of (HEI) input; Slow adoption within LAs; Low levels of comms; Discrete projects and competencies	Low stakeholder participation due to workload / bandwidth; Centralised decisions; Low internal LA collab; Opportunistic funding

(Source: Authors)

4.2. Maturity Model Application

The purpose of a maturity model is to allow the Southern Region map where its position, with respect to maturity in each of the pillars, is at any given time; and to inform future planning. For example, Table 4.2. maps examples of smart activity within the Southern Region. These examples are recognised by those who contributed to this work as discreet projects, but also examples of good practice.

Table 4.2. Example of Activity Mapped to Maturity Model

Maturity	Participation, Subsidiarity and Collaboration	Connect Infrastructure	Data & Technology	Governance
LEVEL ONE 1 Ad Hoc LEVEL ONE				
LEVEL TWO 2 Improving/ Planned LEVEL TWO	Kerry PPN Limerick Leader NW Inter LA coop' Waterford Cultural Quarter	Transport Modes Leap Card Broadband	Smart Dingle RDI Hub FM Campus Smart Enniscorthy LA Open Data Portals	IRD Duhallow Kerry Limerick Cork Digital Strategies Limerick 2030
LEVEL THREE 3 Maturing/ Coordinated LEVEL THREE				
LEVEL FOUR 4 Mature/ Wider Region LEVEL FOUR				

(Source: Authors).

It is the opinion of those who contributed to the various stages of this programme of work that, notwithstanding excellent discreet projects throughout the region, the Southern Region as a whole currently 'sits' at Level 1 (ad-hoc) of the Maturity Model. Table 4.3. is one hypothetical example of using the maturity model to plan and visually present the progression of the Smart Southern Region (SSR) in terms of its level of maturity as a smart region. It suggests two planning phases based on priorities decided by the Southern Region stakeholders. Under this scenario, acknowledging the importance of the quadruple helix model and both the co-identification of challenges to be addressed and co-design of suitable solutions, the plan is to:

- accelerate Participation to a Mature Level 4, region-wide, over the two planning phases, reaching Level 3 in phase 1 and Level 4 in phase 2;
- Incrementally improve Connect-Infrastructure to reach a Low Level 3 of maturity, over the two planning phases;
- Incrementally improve Data & Technology to reach a Mid Level 3 of maturity, over the two planning phases; and
- Implementing a Governance structure / approach reflective of a growing maturity to Level 3 in planning phase 1, and incrementally improving again in planning phase 2.

Table 4.3. Hypothetical Example of a Maturity Model as a Basis for Planning

Maturity	Participation, Subsidiarity and Collaboration	Connect Infrastructure	Data & Technology	Governance
LEVEL ONE 1 Ad Hoc LEVEL ONE				Planning Phase 2
LEVEL TWO 2 Improving/ Planned LEVEL TWO				
LEVEL THREE 3 Maturing/ Coordinated LEVEL THREE				Planning Phase 1
LEVEL FOUR 4 Mature/ Wider Region LEVEL FOUR				Current

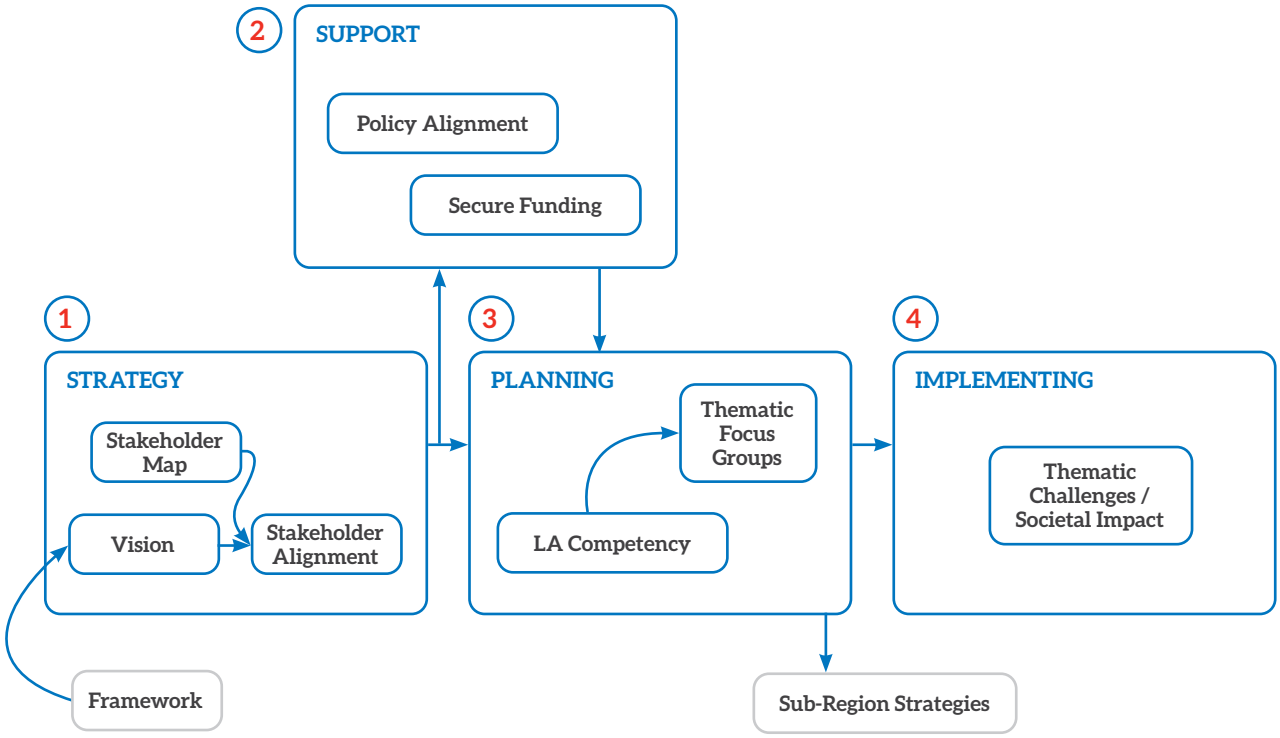
(Source: Authors)

CHAPTER 5: A MEDIUM-TERM IMPLEMENTATION PROPOSAL

From the data gathered from the workshop as outlined in Chapter 4, an implementation strategy emerged. This is a four-stage strategy, as depicted in Figure 5.1. As a proposal, it suggests stages of:

1. Strategising,
2. Building support at a national level;
3. Planning at a thematic level; and
4. Implementation through challenges.

Figure 5.1. Medium Term Implementation Strategy



(Source: Authors)

5.1. Strategy

Stage 1: the proposal suggests, from a strategy perspective, completing three actions.

ACTION 1: Building on the smart framework, to draft a vision for a Smart Southern Region. The data collected suggests that this should include a robust strategy, stressing:

- A broad inclusive participation;
- Integrated and fit for purpose infrastructure; and
- Digitalisation/Technology enabled.

ACTION 2: Identifying the relevant regional stakeholders by completing a stakeholder map. This should include at a minimum of local authorities, national service providers, academia and community and business representatives (operating to the Quadruple Helix model).

ACTION 3: In partnership with the diversity of stakeholders within the region, align around a shared (and ideally co-created) vision such that demonstrates unity of intent.

An output of this strategy stage could be a charter similar to that drafted in Limerick after the amalgamation of Limerick City and County Councils in 2014, where the significant agencies (Local Authority, University of Limerick, Limerick Institute of Technology, Enterprise Ireland and IDA) signed up to a charter committing that they would work together for the betterment of Limerick.

5.2. Support

Stage 2: It is recognised that to build momentum in the development of a Smart Southern Region, it will be necessary to gain central government support and to identify funding sources.

Two key actions define this phase of the maturity model.

ACTION 4: Ensure spatial and economic planning and other sub-regional strategies (such as County Development Plans (CDPs), Local Economic and Community Plans (LECPs), Regional Enterprise Plans, etc.) align to the RSES and Smart Region.

ACTION 5: Consideration to be given to the suite of funds available as part of Ireland 2040, the emerging EU Territorial Cohesion Funds for the period 2021-2027 (e.g., INTERREG), and other EU-funding programmes such as the EU Green Deal.

5.3. Planning

Stage 3: Following the strategic phase, and ideally bolstered by the support action, the proposal suggests two planning actions.

ACTION 6: The strong proposal that came from the interviews and the validation workshop is that the advancement of a Smart Southern Region should be done on a domain or thematic basis; for example, in the areas of energy retrofitting, bathing water quality, and future mobility. Working in thematic areas leads to more focused participation; with consultations based on tangible plans. Under such an approach, participation is not restricted to only those who make submissions or contribute, while consultation can be to a wider audience. Such engagement should build upon RSES and City/County.

Development Plan preparation and implementation, leveraging stakeholder networks (including the PPNs) and aligning actions (avoid duplication).

ACTION 7: In parallel, it is deemed important to develop competencies across the 'smart concepts' (see Figure 1.3.) within local government as local authorities (LAs) are viewed as the natural focal point for advancing smart projects and behaviour – not least because of their knowledge and understanding of local challenges and opportunities and the core function they play in transposing national policy at a local level. Competency development includes:

- An awareness of what a smart region means;
- The role of local government in enabling a smart region; and
- A greater cross-departmental approach to smart project implementation internally ("a new delivery process").

5.4. Implementation

Stage 4: Following the planning stage, the proposal suggests choosing priority domains and high impact projects.

ACTION 8: In order to advance a smart region that creates both societal impact and awareness, the proposal is that a number of thematic specific challenges are set. Internationally, the challenge approach is used very effectively (see Report 2 in this series - International Approaches to a Smart Region) and has precedence in Ireland with the Enterprise Ireland support programme, the Small Business Innovation Research (SBIR) process[ii]. The SBIR challenges fall under pre-commercial procurement, enabling public bodies to purchase research to stimulate innovation when goods or services are currently not available in the marketplace. Used effectively in the past

by both Cork and Waterford, SBIR helps the public sector to address identified 'Challenges' that impact the citizen. SBIR is underpinned by a sharing of both risks and benefits between contracting organisations and suppliers.

As outlined in Report 2, academia and the community must be actively engaged in identifying the challenges – but also in co-creating the solutions. There is a critical role for the SRA in creating the right citizen engagement spaces where local issues/needs can be tabled, ideas generated and potential solutions explored.

5.5. Final Smart Southern Region Definition and Recommendations

RECOMMENDATION 1: It is the authors recommendation that the SRA initially obtain commitment from the local authorities in the region. This assumes the presentation of a smart region vision to local authority senior staff, where:

- Commitment can be agreed;
- A governance approach be proposed that aligns with the existing objectives, priorities and outcomes of the NPF, RSES and associated city and county development plans, and which can be advanced in parallel with the implementation of the RSES and City/County Development Plans.

Any governance structure adopted must be flexible and adapt as the region matures; a process being reflected in the adoption of a current definition for the SSR.

Taking on board key messaging from the consultations in Report 1 and the initial definition for a SSR tabled, together with key learnings from international approaches to a smart region in Report 2, and the maturity framework discussions as outlined in this report, it is proposed that the following bespoke smart region definition (and vision) for a Smart Southern Region, be adopted:

> *"The Smart Southern Region involves the regions stakeholders working together harnessing the best available technology and data to co-create a creative and innovative Region with sustainable and liveable cities, towns and communities.*

RECOMMENDATION 2: It is then suggested that the SRA request assistance in the drafting of a stakeholder map of the region to include the diversity of stakeholders, from central and local government, community, Higher Education Institutes (HEIs), and service providers.

RECOMMENDATION 3: These stakeholders should be presented by the SRA with the current vision (as outlined above), the commitment from the local authorities and the proposed governance structure where:

- Commitment can be agreed;
- The current vision can be reviewed and an updated vision co-created as appropriate;
- The governance structure can be revised as appropriate and agreed.

RECOMMENDATION 4: With the assistance of the local authorities, the SRA will complete the baseline smart mapping tool, and agree ongoing responsibilities for its future accuracy and upkeep.

RECOMMENDATION 5: The last recommendation from this work is that those involved in the governance of the development of the Smart Southern Region assemble to formulate an action plan, to include:

- In the context of a co-created vision, set boundaries of future work;
- Establish a working group to attract funding that is dedicated to building a smart region;
- Defining priority thematic domains through a consultative process; and
- Establish a cross-sectoral working group to define thematic challenges and oversee associated funding calls.

ANNEX 1: The Research Team

Office of Engagement and Innovation, Maynooth University

The Office of Engagement and Innovation was created to build and maintain strategic research and innovation partnerships with a range of external institutions, including enterprise, public sector, and civic organisations. The goals of the Office are (a) to facilitate the smooth participation of Maynooth University staff members in external collaborations and projects such bodies through the development of strategic partnerships, including research, education, and contracts and (b) to ensure effective supports in place for staff to collaborate and partner with a diverse range of external agencies.

The International Centre for Local and Regional Development (ICLRD)

The International Centre for Local and Regional Development (ICLRD) is a North-South-U.S. partnership. It was formally established in 2006 to explore and expand the contribution that spatial planning and the development of physical, social, and economic infrastructure can make to peace and reconciliation on the island of Ireland, and elsewhere. The ICLRD has developed out of a unique collaboration between academics and spatial planning specialists, with current partners including the National Institute for Regional and Spatial Analysis (NIRSA) at Maynooth University, the Belfast School of Architecture and the Built Environment at Ulster University and the National Center for Smart Growth at University of Maryland.

A central objective of the ICLRD is to strengthen the policy and operational linkages between central, regional, and local policy makers and among officials and practitioners involved in spatial planning and social and economic development across the island of Ireland. It does this through action research, policy advice and publications; professional facilitation and education and capacity building programmes that assist local governments and communities to translate policy into 'on the ground' action; and active outreach and networking that includes conferences, workshops and international co-operation and exchanges to identify best practices. Further information on the work of the ICLRD is available at *www.iclrd.org*

School of Business, Maynooth University

The School of Business in Maynooth University primarily provides challenging and engaging undergraduate and postgraduate degree programmes which encourage students and participants to develop critical capabilities that will help shape the workplaces and practices of the future. The school creates new knowledge, products and services that underpin sustainable economic growth. It partners with practitioners and businesses, not only to ensure that our offerings are relevant, but also so they can develop new insights into ways of improving the performance of organisations and the people who work for them. It develops socially responsible managers and leaders and ethical businesses, and it develops insights which can be shared with businesses, organisations, professionals, and society.

ANNEX 2: Overview of Workshop Discussions

This section depicts the discussions of the individual breakout groups as part of the smart maturity workshop held on 1st July 2021. Each breakout group was facilitated through questions that allowed the drafting of a maturity path.

Breakout Group 1:
Participation, Subsidiarity and Collaboration

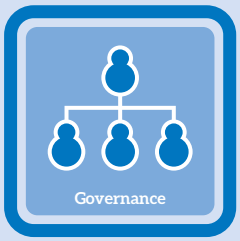
Maturity	Description
LEVEL FOUR 4 Mature/ Wider Region LEVEL FOUR	• Evidence of trust, understanding, enthusiasm, effectiveness, respect, inclusive, equality • Strong participation from the main public and civic stakeholder groups – (Quadruple Helix) • Recognition for, and use of, expertise from within the stakeholder base
LEVEL THREE 3 Maturing/ Coordinated LEVEL THREE	• Evidence of participation from smaller stakeholder groups • Strategy of focused engagement (e.g., environment) • Greater use of PPNs and HEIs • Participation actions documented
LEVEL TWO 2 Improving/ Planned LEVEL TWO	• Regional participation strategy developed • Wide consultative process • Evidence of sub-region collaboration for specific projects • Central government support
LEVEL ONE 1 Ad Hoc LEVEL ONE	• Stakeholders act independently • Limited stakeholder inclusion • Lack of clear medium-term vision • Discrete projects (e.g., Waterford Cultural Quarter Strategic Plan; Limerick Cityxchange; various Urbact networks; Cyber Ireland's engagement across academia, industry and government; PPNs; Ennis Tidy Town; Limerick Leaders Network; Ormston House Limerick (a meeting place for the arts)

Breakout Group 2:
Connectivity – Large Infrastructure and Services

Maturity	Description
LEVEL FOUR 4 Mature/ Wider Region LEVEL FOUR	• Enabling infrastructure in place • Evidence based planning • 10-minute town capable (in towns of excess 10,000 inhabitants)
LEVEL THREE 3 Maturing/ Coordinated LEVEL THREE	• Natural resources plan in place • Infrastructure to match population growth • Evidence of funding and delivery programmes
LEVEL TWO 2 Improving/ Planned LEVEL TWO	• Evidence of regional cross-domain planning • Regional rollout of 10-minute town • Evidence of regional wide technology implementation (e.g., travel card, unsealed car parks, energy retrofitting)
LEVEL ONE 1 Ad Hoc LEVEL ONE	• Lack of access to funding • Lack of real time data • Immature infrastructure • Poor broadband • Discrete projects (e.g., Transport Leap Card; School Safe Zones materials developed by National Transport Authority (NTA) and Green Schools to be installed outside all schools in region; Transport designed for children, elderly and those with mobility issues; Retrofit applications to the Sustainable Energy Authority of Ireland (SEAI) can now include costs for smart meters)

Breakout Group 3:
Data & Technology

Maturity	Description
LEVEL FOUR 4 Mature/ Wider Region LEVEL FOUR	• Ubiquitous technology enabled public services • Data driven problem identification and solution • Long term funding commitment • Open data enabled • Within local authorities, smart planning is a cross-directorate activity
LEVEL THREE 3 Maturing/ Coordinated LEVEL THREE	• Key Performance Indicators (KPI's) in place • Evidence of a technology / data driven service delivery process • Centralised dashboards • Open data audits • Data savvy citizens • Community communications
LEVEL TWO 2 Improving/ Planned LEVEL TWO	• Local authority staff aware of smart vision, strategy and impact • Local authorities commitment • Domain specific focus groups (e.g., open data, smart towns, smart economy, industry led partners)
LEVEL ONE 1 Ad Hoc LEVEL ONE	• Low levels of sharing • Low levels of Higher Education Institutes (HEI) involvement • Slow adoption within local authorities • Low levels of communication • Discrete projects and competencies (e.g., Network of research hubs works well internationally and with other stakeholders e.g., Tyndall; National Open Data portal and legislation in place; Most local authorities have an open-data dashboard; Engagement with technology leaders such as it@Cork, Energy Cork, Academia; Limerick Digital Innovation Forum (LDIF) (supporting the Limerick Region)



Breakout Group 4:
Governance

Maturity	Description
LEVEL FOUR 4 Mature/ Wider Region LEVEL FOUR	• Balance between central control and regional coordination • Robust vision • Specific mission orientated objectives in place
LEVEL THREE 3 Maturing/ Coordinated LEVEL THREE	• Funding sources identified • One (or more) regional projects with wide impact • Technology enabled participation
LEVEL TWO 2 Improving/ Planned LEVEL TWO	• Stakeholder map in place • SWOT analysis complete • Dedicated resources • Local authority working groups • Evidence of sub-region planning
LEVEL ONE 1 Ad Hoc LEVEL ONE	• Low stakeholder participation due to workload / bandwidth • Highly centralised decision making • Low internal local authority collaboration • Grows through opportunistic funding • Examples of activity: Limerick 2030 model; Existing relationships with European Cities and Regions to learn from best practice of regional or national initiative e.g. Finland, Netherlands, Scotland; European initiative - Intelligent Cities Challenge (ICC) is working with 136 cities and trying to support smart places across small and medium cities/ regions; Participation of Cork, Limerick and Waterford in the All Ireland Smart Cities Forum (AISCF); Very strong track record of EU research funding in the HEIs

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Endnotes

i. For Further details on the COHES3ION Project, see https://www.interregeurope.eu/cohes3ion/

ii. https://www.enterprise-ireland.com/en/Research-Innovation/SBIR-Ireland/