A Fourth Way

The Role of Cultural Heritage in

Embedding Place-Driven Innovation

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Contents

4.2 Exploring Innovation Frameworks through Case Study

4.2.1 Science-led: Greater Manchester's linear approach to innovation

4.2.1.1 GM Innovation Districts

4.2.1.1.1 Oxford Road Corridor

4.2.1.2 Media City

4.2.1.3 The Sharp Project

4.2.1.4 NOMA

4.2.2 NSI in the USA: Boston/Cambridge and the Techno-Economy

4.2.2.1 Boston/Cambridge Innovation Districts

4.2.2.1.1 Kendall Square

4.2.2.1.2 Seaport

4.2.2.1.3 Roxbury

4.2.3 The Quadruple Helix: Engaging the citizenry in Seattle/King County

4.2.3.1 Seattle/King County Innovation Districts

4.2.3.1.1 South Lake Union

4.2.3.1.2 Pioneer Square

4.2.4 Innovation from the Grassroots: The Liverpool City-Region

4.2.4.1 Liverpool City-region Innovation Districts

4.2.4.1.1 Sci-Tech Daresbury

4.2.4.1.2 Knowledge Quarter Liverpool

4.2.4.1.3 Liverpool Innovation Park/ Wavertree Technology Park

4.2.4.2 Creating Places for Innovation

4.2.4.2.1 The Baltic Triangle

4.2.4.2.2 The Fabric District

4.2.4.2.3 Ten Streets

4.2.4.3 Community-led Innovation

4.2.4.3.1 Kensington, Picton and Wavertree

4.2.4.3.2 Granby/Toxteth (L8)

4.2.4.3.3 Anfield

4.2.5 Case Study Interviews – Coding Results

4.2.6 Survey Results

4.2.6.1 Profiling Information

4.2.6.2 The Innovation District

List of Tables & Figures

Tables

Figures

List of Abbreviations

CIC (1)	Cambridge Innovation Centre
CIC (2)	Community Interest Company
CLT	Community Land Trust
COVID-19	Coronavirus Disease 2019
EC	European Commission
EU	European Union
ESRC	European Science and Research Council
GDP	Gross Domestic Product
GM	Greater Manchester
GMCA	Greater Manchester Combined Authority
GVA	Gross Value Added
ICOMOS	International Council on Monuments and Sites
IMD	Index of Multiple Deprivation
IR4	The Fourth Industrial Revolution
LEP	Local Enterprise Partnership
M4	Manchester 4 (Postcode area of the 'M4' action research project)
MAPS-LED	Multidisciplinary Approach to Plan Smart Specialisation Strategies for Local Economic Development
ONS	Office of National Statistics
RSA	The Royal Society of Arts
S3	Smart Specialisation
SDGs	Sustainable Development Goals
SMEs	Small and Medium-sized Enterprises
UNDP	United Nations Development Plan
UNESCO	United Nations Educational, Scientific and Cultural Organisation

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Abstract

Set against an already powerful context of political instability and global economic uncertainty, and further intensified by the unprecedented challenges presented by the COVID-19 pandemic, the paradigm of ‘place’ which, prior to the pandemic, had seen a rapid incorporation into all levels of policy making and practice, has prevailed through an intense period of instability, scrutiny and challenge. In the context of EU policy, the notion of ‘place’ has been particularly prevalent in driving the development of 'Smart Specialisation' strategies (S3), a programme based primarily on identification and assertion of unique regional assets as drivers of innovation and regional competitiveness. Interpretation, development and evaluation of place in the context of S3 has been previously dominated by two conceptually static definitions: a physical understanding of place as a defined, geographic territory and a socio-economic understanding of place as a self-contained economic and social system. Comparative assessment of regional competitiveness, reflecting the norms of economic practice, has tended to rely on productivity measures such as GDP. In the wake of the pandemic and a growing recognition of the limitations of competitive practice (as opposed to collaborative approaches), and a widespread acknowledgement of the associated limitations of productivity and GDP as performance measures, this thesis introduces cultural heritage as a third and critical criterion in realising a deeper and more comprehensive understanding of place. Through pragmatic application of mixed methods, the research seeks to interrogate the inter-relationship between place and innovation, exploring the place/innovation nexus through a cultural heritage lens. Further exploration of place as a driver for sustainability and resilience catalyses a necessary redefinition of economic performance and, by extension, of what is meant by economic success. Integrating factors of space and time, and incorporating characteristics of light and sound, the research proposes a new and dynamic conceptual model for innovation economies founded on the notion of 'place-driven' development and collaborative action toward a shared mission of sustainability, conceiving of a new ‘four-dimensional’ economic paradigm and proposing a new assessment framework within which the fourth space is ‘unlocked’ by the foregrounding of cultural heritage in the place-driven paradigm, and through which a whole series of previously accepted tripartite models can be elevated; presented collectively as ‘A Fourth Way’.

Keywords: Place, Innovation, Cultural Heritage, Embeddedness, Sustainability

1. Introduction

"This moment calls for nothing less than the radical re-imagining of our world."

Noam Chomsky, March 2020

1.1 Socio-Economic Context – A Time of Change

The COVID-19 pandemic has brought extreme and unprecedented challenges to a world already crumbling under the pressure of war, famine, climate collapse, stark inequalities and austerity, the killing of George Floyd, the reign (and extended departure, and legacy) of former US President Trump, devastating wildfires in Australia and California, the rise of far-right ideologies and the ever-present spectre of Brexit. In just over a year, there have been over one-hundred and twenty million cases of coronavirus worldwide and almost two million deaths (World Meters, 2021). The pandemic, the vast and still-growing number of lives that it has cost, its direct and indirect toll on our individual and collective physical and mental health, the extraordinary actions and behaviours it has necessitated, and its disproportionate impacts have cumulatively combined to devastating effect, thoroughly exposing the limitations of our current economic model. In early 2020, the global stock market faced its worst crash since the 2008 crisis, dropping sharply between February 2020 and April 2020 and prompting the World Trade Organisation to forewarn that the pandemic could bring "the deepest recession of our lifetimes" (WTO, 2020). The World Bank has since predicted a global contraction of 5.2% over 2020 (The World Bank, 2020). In comparison, and to give an appreciation of scale, the 2008 crisis saw a contraction of just 0.1% (The World Bank, 2020).

2021 sees a world adapting to long-term crisis. 'Lockdowns', social distancing and face-masks have been rapidly integrated into daily lives and the social consciousness. There is an almost perceptible sense of instability, insecurity and transience, and of not knowing what comes next. Naturally, this circumstance brings with it fear and uncertainty, permitting and giving rise to the whole spectrum of negativity, panic and despair, but what also lives here is *hope.* As Carlota Perez observes, every noted period of industrial discovery and enlightenment throughout history has been immediately preceded by an intense period of crisis – a turning point (Perez, 2016). Perez envisages the time immediately ahead of us as the 'sustainable age of technology', a 'Smart Green' golden age (Perez, 2016). This forthcoming period is widely

referred to as the 'Fourth Industrial Revolution' (Schwab, 2016) and characterised by Scharmer (2016) as 'Economy 4.0'.

Economy 4.0 marks a shift into what Scharmer (2016) calls 'ecosystem economics', characterised not only by a sharply focussed awareness of the global economy as a networked, reciprocal ecosystem but by a deep understanding of the role of the individual as a direct contributor to and within that global ecosystem. Scharmer describes the 4.0 ecosystem as the next level in a sequential evolution of dominant economic schools, having previously travelled through state-centric (1.0), free market (2.0) and socioeconomics (3.0). This shift sits alongside entry into the 'Fourth Industrial Revolution' (World Economic Forum, 2017), journeying over four centuries through the first industrial revolution of the 1780s, moving to mass production through steam and electricity in the 1870s, automation in the 1950s and the mass adoption of digital technology through the 1990s and 2000s. (World Economic Forum, 2017) Human contribution is critical to the 4.0 economic 'ecosystem' (Scharmer, 2016). The World Economic Forum identifies the top three skills required by technology companies in the 4IR as complex problem solving, critical thinking and creativity (World Economic Forum, 2016). All three are innately human skills, despite a general understanding of the 'Fourth Industrial Revolution' (4IR) as the coming of a technological age (World Economic Forum, 2017).

Underlined by the need for individual and collective action in response to the challenges of the COVID-19 pandemic, there is an opportunity to embrace the current zeitgeist by foregrounding human contribution to innovation as the principal characteristic of the Fourth Industrial Revolution and the 4.0 age. A more explicit recognition of human contribution and adoption of a more holistic perspective in turn allows for a broader understanding of 'innovation' not just as a fixed, tangible *product*, a 'thing' which exists in 'innovation districts' and which can be manufactured in labs, developed, commercialised and sold (and which pitches universities, cities and countries against each other in a 'competitive' innovation race), but as a dynamic and networked *process*, a rich and multi-faceted human experience that embraces people as innovators and encourages human creativity, enterprise, endeavour, discourse and dialectical interplay. Against pressing sustainability imperatives, new economic models which seek to express value in terms of human contribution, and which are based on collaborative rather than competitive principles are coming to the fore. Work by Mazzucato (2017, 2021), for example, has brought forward the idea of 'mission-oriented' economies and strategies, moving away from the notion of siloed sectors and individual corporates competing for market share and

advocating instead for collective action in tackling social challenges and working toward shared economic goals.

As we navigate our way into the 4.0 age, there is a growing tension with the paradigm, infrastructure, tools and evaluation mechanisms designed in support of the 'old economics' (Kleibrink et al, 2016). Broadly speaking, this tension is underpinned by an entrenched school of thought which separates the 'economic' and the 'social', and which tends to define 'economic' in purely fiscal terms (Perch, 2012). In this polarised understanding, the understood economic 'mission' is wealth generation, and the principal measure of success is accumulation of wealth (Blakely, 2019). This is the paradigm of capital, of GDP, of an understanding of human endeavour purely as 'productivity' and of people as generators of product in a labour market. It is the paradigm of economics 2.0, the limitations of which were felt in 3.0, but which are arguably even more acute in our move to 4.0. There is an increasingly apparent need for a new measurement system to support a critical shift from a principally *extractive* economy to a *generative* economy (Leicester, 2017); one in which the shared 'mission' is not accumulation of wealth, but which instead focusses on our collective wellbeing and our capacity to meet our most pressing shared challenge: the sustainability of our species and planet.

1.2 Strategic and Policy Context – The Place/Innovation Nexus

'Place' continues to loom large in (primarily urban) development strategy, policy and practice, alongside the ongoing devolution agenda in the UK, and renewed calls for localism. To date, and perhaps related to the speed of its initial ascent and conceptual incompleteness, 'place' has been primarily interpreted either in spatial terms, as a fixed geographic territory, or as a self-contained socio-economic system. This static understanding of 'place-based' approaches has in some instances meant a retreat to insularity and parochialism, resulting at times in an approach presented as an alternative being, in fact, the same 'old economics' model, simply played out a local scale. The latest 'place-based' model to gain prominence, 'Community Wealth Building' (Guinan et al, 2020), seeks to minimise wealth extraction from local economies through non-local procurement and property rents and instead aims to generate local benefits through re-investment in the local economy and community ownership models. While the approach has seen some success in pilot areas in terms of retaining spend in the local area, this is one example of where a 'place-based' approach encourages an inward-looking, insular flow.

This directionality is diametrically opposed to current and emerging calls for more expansive approaches to innovation, as demonstrated by Schot and Steinmuller's 2018 paper which calls for a new framing of transformative innovation policy toward "socio-technical system change" and in support of the UN's Sustainable Development Goals (SDGs), which they characterise as 'Innovation 3.0' (Schot & Steinmuller, 2018).

A broader definition of innovation is already evident in EU policy. Robert Madelin's 2016 paper on the future of innovation in Europe for the ESRC (delivered on behalf of the European Commission), for example, explicitly states that "Innovation is more than science and technology. Social demand and needs-driven innovation matter more than ever". (EC, 2016). Madelin's paper begins to explore how specific elements of EU policy, including the flagship concept of Smart Specialisation, can be adapted to support a broader understanding of innovation that responds not just to an economy's assets and strengths, but to its most pressing needs. Rissola et al's 2017 report for the EC's Joint Research Centre advocates for dynamic, place-based innovation ecosystems and "a quadruple helix paradigm (companies, research and innovation centres, the public administration and citizens) in the design and implementation of innovation strategies" (Rissola et al 2017). Rissola's report notes an assertion by Autio et al (2014) that "by associating entrepreneurship with innovation, governments and national systems on innovation (NSI) have generally adopted policies and initiatives to stimulate innovation in entrepreneurial firms (including university-based start-ups) without paying sufficient attention to ***when*** and ***where*** entrepreneurs innovate". 'The where' of entrepreneurial discovery and innovation has been the basis for the MAPS-LED (Multidisciplinary Approach to Plan Smart Specialisation Strategies for Local Economic Development) international and interdisciplinary research programme, bringing partners together from the UK, US, Italy and Finland in an exploration of the spatial dynamics of innovation and its relationship to cross-sector networks in place. The resulting portfolio includes exploration of the quadruple helix paradigm in the case of Boston (Rissola et al, 2017), proposing a "new generation" of urban innovation centres, which Monardo (2018) refers to as "turbines of smart strategy".

Foray, whose work has been seminal in the development of the Smart Specialisation concept in both theory and practice (Foray 2014, 2015, 2018, 2020), reflects in a recent paper on the importance of the 'bottom-up component of the S3 approach' (Foray et al, 2020) and its centrality to the process of 'entrepreneurial discovery' (the act of finding a new product, purpose, resource or opportunity, as described in Kirzner,1997). This broad base understanding of innovation, both in terms of '***what'*** innovation is and '***who'*** has licence to innovate is

explored in detail in the final report of the MAPS-LED team, which builds on findings from its Boston/Cambridge case study to assert that macro-innovation ecosystems are composed of 'a variety of interconnected micro-innovation ecosystems', and further that the success of these ecosystems is dependent on 'strong multi-stakeholder engagement' and the extent to which approaches to innovation are 'embedded in the social and spatial fine grain of places and encompassing a diversity of actors' (Rissola et al, 2019).

The '***where***' in relation to how innovation is physically and spatially manifest is inherent to the dual challenge of 'embeddedness' and multi-stakeholder participation. A portfolio of work from The Brookings Institute's Bass Initiative has been seminal in framing thinking and practice around spatial approaches to urban innovation, and the emerging interconnectivity between innovation and 'place'. Katz and Wagner (2014) define an 'innovation district' as "a geographic area where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators, and accelerators" "a geographic area where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators, and accelerators" and assert a typology based around three models of 'innovation districts' in cities: the 'anchor plus' model, in which a clustering of assets and infrastructure occurs around the presence of an anchor institution, such as a university; the 're-imagined urban areas model', in which former industrial or warehousing sites undergo large-scale regeneration (often, Katz and Wagner observe, to be found in historic waterfront districts); and the 'urbanized science park' model, which sees new industry and commercial activity in suburban or ex-urban areas growing around clustered scientific activity (Katz & Wagner, 2014),

1.3 Key Concepts

Using the Katz/Wagner (2014) typological framework as a foundation, this thesis explores the inter-relationship between spatial approaches to innovation and the emerging paradigm of 'place', taking the concept of place beyond the 'fixed' spatial and socio-economic terms in which it tends to be applied. The well-practiced tenets of place as a set, bordered geography or a set, bordered socio-economy, fit 'place' comfortably within the current and predominantly capital-driven economic paradigm, where the territorial understanding fits neatly with the notion of capital's 'spatial fix' (Harvey, 2001) and the socio-economic application of 'place' mimics the defined parameters of the labour market. Less comfortable is the interaction

between these static definitions of 'place' and the inherently dynamic innovation economies of the Fourth Industrial Revolution, and the 4.0 age.

'Place-based' approaches to innovation tend to seek or prove 'embeddedness' in a place through a focus on the acknowledged (primarily industrial) strengths of a place, which are often so called because they have a basis in a place's past history. For example, Greater Manchester's acknowledged heritage in manufacturing is acknowledged as a driver in its adoption of advanced manufacturing as a 'smart specialism' (GMCA, 2013). My work asserts that an over-dependence on historical significance to a place can tether both the place and opportunities for innovation to the confines of its history, restricting diversification and entrepreneurial discovery. An overt focus on perceived place strengths can also result in sanitisation and homogeneity, missing particular idiosyncrasies of place that give distinct character or areas of challenge ripe for innovative responses. Restricting a place to a characterisation of its past risks overlooking socioeconomic changes in the years since, such as changes to a place's population, demographics and ethnic diversity, and of macro-economic changes in, for instance, distribution and labour markets. Greater Manchester's heritage in manufacturing, to stay with the example, grew symbiotically with neighbouring Liverpool's status as a global centre for shipping (driven in turn by its geographical position on the Northwest coast of England and related heritage as a maritime city). The socioeconomic impacts of changes in logistics and distribution and the seismic effects of globalisation cannot be overstated here. A place's modern and contemporary heritage, alongside ongoing changes to a place's cultural profile, are disregarded to its detriment and can result in a dissonance between the expectations of a place and its ability to live up to the glories/strengths of its past.

Instead, I propose that there is an opportunity to 'liberate' and significantly enhance both place and innovation through the prioritisation of *cultural* heritage in our understanding of place and embeddedness, embracing the rich inter-complexities of culture and its past, current and future dynamics. My work builds on a holistic understanding of culture, as present in the work of Raymond Williams, who describes culture as "a whole way of life" (Williams, 1958) and is augmented by an observable evolution in definitions of 'cultural heritage', including UNESCO's formal recognition of 'intangible cultural heritage' in 2003. UNESCO defines intangible cultural heritage as "traditions or living expressions inherited from our ancestors and passed on to our descendants, such as oral traditions, performing arts, social practices, rituals, festive events, knowledge and practices concerning nature and the universe or the knowledge and skills to produce traditional crafts", highlighting that intangible cultural heritage can be

past or contemporary, but must be inclusive, representative and community led. It "can only be heritage when it is recognized as such by the communities, groups or individuals that create, maintain and transmit it – without their recognition, nobody else can decide for them that a given expression or practice is their heritage" (UNESCO, 2003)

The construct of 'embeddedness' is critical to the place/innovation nexus both from an innovation perspective, for example as it is applied to the Smart Specialisation process and its requirement for 'an accent on fostering regional embeddedness' (EC, 2013), and from a 'place' perspective considering for example Rossi's definition of place as "embedding collective memory" (Rossi, 1982). My research explores the inter-relationship between place and embeddedness, introducing 'culture' and specifically 'cultural heritage' as a key to embeddedness and opening up the question of '*how*' place, innovation and cultural heritage inter-relate. Culture, I argue, is a third and critical criterion in realising a broader and deeper understanding of place (alongside acknowledged spatial and socioeconomic factors) and an equally critical factor in realising a broader and deeper understanding of 'innovation'. Integration of these cultural factors in a contemporary discourse around innovation which remains primarily concerned with economic, spatial and – at its most progressive – social factors is in turn, I argue, key to unlocking a new and holistic economic paradigm, characterised as 'A Fourth Way'.

Viewing the key concepts of 'place' and 'innovation' through a cultural heritage lens introduces *time* as a crucial and transformative factor. Heritage, defined by the RSA as 'anything inherited from the past that helps us, collectively or individually, to understand the present, and create a better future' (RSA, 2017a) asserts a timeline and chronology, positioning current – and primarily spatial - expressions of place and innovation as present, 'point in time' manifests, layered on a past and implicit of a future. Incorporating time – the fourth dimension (Minkowski, 1908; Lee, 2007; Henderson, 2009) – as an agent of change in the place/innovation nexus destabilises static spatial (and by extension economic and social) factors, adding a multi-dimensional dynamism, motility and potential for change and allowing, in sequence with the aforementioned 'who', 'what', 'when' and 'where' of innovation, consideration to be given to the **'how'** and the ***'why'***.

1.4 Aims, Objectives and Research Questions

This study aims to create a holistic framework for urban innovation which is able to meet the needs and demands of the present and the future. Within this overarching aim, it seeks:

- To **improve understanding of place, innovation and cultural heritage** and their inter-relationship, and the implications for urban development policy and strategies.
- To demonstrate its contribution to the work of the MAPS-LED partnership, specifically in the **formulation of a novel method** for evaluating the success of European Smart Specialisation strategies (as the University of Salford's specialist research area within the partnership).
- To **contribute new knowledge** to emerging thinking and practice in the fields of built environment, economics and sustainability, and their inter-disciplinary development

and its objectives are:

- To **identify and explore gaps** in urban development and spatial planning strategies in support of innovation.
- To **address identified gaps** toward the development of an enhanced 'urban innovation' taxonomy
- To develop **a taxonomy, methodology and tool prototype for evaluating and monitoring** innovation strategies (including S3) and economies
- To **test the taxonomy, methodology and tool** prototype in practice

The research is framed around four key questions in response to these aims and objectives:

RQ1 What is the inter-relationship between innovation, place and cultural heritage?

RQ2 What is embeddedness and how does it relate to innovation, place and cultural heritage?

RQ3 What are the gaps in urban development strategies in support of the inter-relationship between innovation, place and cultural heritage?

RQ4 How can the relationship between innovation, place and cultural heritage be measured?

1.5 Research Approach

The aims and objectives of the research are primarily concerned with theory and policy making and as such exploration and interrogation of the theoretical and policymaking framework is prioritised in the research approach and methodology. However, the research acknowledges too that there has been critique of innovation policy and specifically its limited practical application (see Benner, 2020) and as such, in the context of an increased interest in systems design and design methodologies, the research approach integrates a secondary and design-led line of methodology toward to development of a practical tool prototype (as stated in the research objectives).

The overall approach brings a programme of mixed-methods research (supported in delivery through case study, action research and direct observation), articulated in the methodology by the nested research model (Kagioglou, 1998) together with a design-focussed programme based on the 'Design Science Method' (Johannesson & Perjons, 2014). The 'Design Science Method' allows for both practical and contextual investigation, focussing as it does on the discrete and interconnected development of an artefact ('the tool') and its context.

The research is presented within an observable shift toward employing **design** methods and strategies in contemporary approaches to economic modelling and policy development and further toward **system-based** modelling and systems change (as demonstrated by the RSA's 2017 programme of work *From Design Thinking to Systems Change*, delivered in partnership with Innovate UK, RSA 2017b). Through pragmatic application of mixed methods, and with a maintained focus on progress through the sequential stages of the 'Design Science Method', the research seeks to approach ideas, theories and concepts of scale, depth and ambition with grounding, precision and example, exploring and interrogating a series of interconnections and intersections between agent and context, including between the individual and the collective, the actor and the system, the 'innovation district' and the 'city-region', and the local and global.

1.6 Purpose and Motivation

The COVID-19 pandemic has brutally distorted our relationship with both space and time, raising practical and existential questions about our contemporary way of life and the future of our species and the planet. Successive 'lockdowns' have seen the concept of time take on new meaning as 'time at the office' has become a thing of the past and time with our loved ones has

become unavoidable for some and rarer and more precious for others. Notions of space too have been reconfigured with the advent of social distancing revealing the importance of personal and public space and creating new challenges for spatial planning and management.

The concept of 'place', which prior to the pandemic had already made a rapid ascension into policy making in correlation with the devolution agenda and renewed calls for localism, has seen a recent re-emergence thanks in some part to the necessary lockdowns forcing an increased focus on immediate localities and consequently spurring a new wave of support for place-based approaches, spearheaded across the UK with the adoption of 'Community Wealth Building' strategies. 'Community Wealth Building' is the latest in a swathe of alternative economic models that have emerged in the wake of the 2008 economic crash and which have since been foregrounded by the pandemic, including inclusive growth (RSA, 2017c), green growth (OECD, 2011), de-growth (Jackson 2009; Kallis et al, 2020; Hickel, 2020), definancialisation (Blakely, 2019), Doughnut Economics (Raworth, 2017), mission-oriented economics (Mazzucato 2017 and 2021) and economic models based around 'wellbeing' (Trebeck & Williams, 2019; Hoekstra, 2020). Internationally, Iceland, New Zealand, Germany and Scotland have led the way in pursuing 'wellbeing economies', with New Zealand being the first to introduce a 'wellbeing budget' in 2019 and a corresponding dashboard of performance indicators in 2020.

The continued search for new, alternative systems of governance and better models of economic, spatial and social arrangement has seen concepts such as place, innovation, heritage, wellbeing and community rise to prominence in both policy and practice. Despite their widespread adoption, a knowledge gap persists in how these concepts are defined and manifested, how and to what extent they relate to each other, how they are expressed, measured and evaluated, and, consequently, the extent to which their economic role is understood. From a practitioner's perspective, there is a deep frustration with the limitations of currently available tools to assess the efficacy and success of progressive approaches. At a micro-level, evaluation too often requires projects to fit broad-scope social impacts into narrow 'tick boxes' and, in many cases, continued project funding or re-commission is dependent on this limited analysis. At a macro-level, there is a growing acknowledgement of the limitations of GDP and its inability either to express a valid picture of economic success or to encompass new economic models and reflect collective progress (see Haskell et al; Coyle & Mitra-Khan; Devaney and others in the Global Indigo Prize Journal, 2017)

Having worked for almost twenty years in economic development, from my first professional role at The Mersey Partnership, where I led the first-ever review of the Merseyside economy in 2003, to my work with Manchester's New Economy from 2011 to 2015, along with a broad experience of working across arts, culture and heritage, including as Strategic Lead for Place and Culture in the North of England (2020/1) and leading the Royal Society of Art (RSA)'s '*Heritage, Identity and Place'* portfolio of research (2014-17), alongside a portfolio of work in European policy, specifically as the author of Greater Manchester's 'Smart Specialisation' (2013) and 'GM Science and Innovation' (2015) strategies, a key motivation in pursuing this study has been to explore the interconnectivities between the concepts of 'place', 'innovation', 'culture' and 'heritage', to identify the barriers to understanding which persist, and to address that knowledge gap.

My motivation is further driven, therefore, by a desire to address the conceptual incompleteness of 'place', as it continues its ascent as a widely applied and accepted principle in urban development, spatial planning and policymaking, and to further enhance its application in practice. In exploring 'place-based' spatial and investment decisions, I am keen to understand in particular the extent to which there is a relationship between these decisions with local and indigenous communities of place, local cultures and heritage, and in exploring the impacts of investment decisions on and relation to socioeconomic and spatial inequalities. In exploring spatial and investment decisions related to 'innovation', I am keen to understand the extent to which innovation strengths are purposed toward addressing current spatial and socioeconomic inequalities, with humanitarian crises of homelessness evident in all four areas of case study, but especially in Greater Manchester in the UK and King County (Seattle) in the US, and toward macro challenges such as the COVID-19 pandemic and climate change.

Finally, there is a widely acknowledged and pressing imperative to identify, understand and employ a new system of economic governance and performance measurement as the limitations of a system founded on hyper-financialisation, competitiveness, and unrestrained growth continue to be exposed. This imperative has been made more urgent by the unprecedented challenges of the COVID-19 pandemic. One of my strongest motivations is to contribute new knowledge to the emerging narrative around alternative economic system design, and specifically to demonstrate how cultural heritage, place and innovation can combine to address social and global challenges and are integral to developing successful and – critically - *sustainable* economic approaches for the '4.0' age, and beyond.

1.7 Thesis Structure

The thesis is structured across seven chapters.

Chapter One serves as an introduction to the research and the research approach, detailing the research questions, aims and objectives, presenting relevant strategic and socio-economic context and setting out the purpose and motivation behind the research.

Chapter Two sets out the theoretical and subject-based context for the research. It is structured as a systematic review of literature related to each of nine core research concepts in turn, namely (and in sequential order): 'space', 'place', 'culture', 'innovation', 'cultural heritage', 'embeddedness', 'light', 'sound' and 'time'. The chapter also features a review of innovation frameworks, contemporary and emerging economic models and a summary of key findings.

Chapter Three sets out the research and design methodology, relating to the sequential layers of the nested research model (Kagioglou et al, 1998) and the six sequential stages of the 'Design Science Method' (Johannesson & Perjons, 2014).

Chapter Four presents results and findings from the research, including results from:

- Case studies (Greater Manchester, Greater Boston – Boston/Cambridge, King County – Seattle and the Liverpool City Region)
- Surveys undertaken with community members in Impact Hub, Seattle and The Federation, Greater Manchester (with fifty respondents in Seattle and fifty-seven in GM)
- Interviews with practice and policy experts.
- The 'M4' action research project and associated Delphi method testing
- Evaluative commentary and feedback regarding the development of the prototype tool.

The chapter presents several examples of new knowledge generated through the research, including the 'Sustainable Innovation Wheel', a new 'place' taxonomy, a new typology of spatial flow and the 'Civic Investment Value' index (CIV 4.0).

Chapter Five presents analysis of the results and findings of the research, in the context of the literature review and a discussion of those results and their implications in relation to new and emerging work and contexts (not least the current context of the COVID-19 pandemic and its associated 'lockdowns').

Chapter Six sets out conclusions drawn from the research overall and makes recommendations on this basis for current and future policy and practice.

Chapter Seven reflects on the research as a whole and on its strengths, limitations and challenges. It sets out key impacts achieved over the course of study and discusses current and emerging opportunities for application.

The questionnaire utilised throughout the study is attached for reference in the appendices to the thesis, along with full quantitative results from the surveys, Delphi exercise and word frequency content analysis. This is followed by a glossary of key terms and full referencing.

2. Literature Review

2.1 Introduction

The primary aim of the research is to create a holistic framework for urban innovation which is able to meet the needs and demands of the present and the future. It seeks to achieve this through critical evaluation of existing innovation frameworks, underpinned by an enhanced understanding of the inter-relationship between place, innovation and cultural heritage. Its exploration of this triad of concepts immediately asserts it within a deep historical, social, cultural, theoretical and literary tradition of tripartite structures, forms, social and cultural reference points, systems and models which incorporates everything from Lefebvre's '*rhythmanalysis*' of 'space-time-energy' (Lefebvre, 1994), Heidegger's three *ecstaces* of time (Heidegger, 1927), Foucault's *heterotopias* (a 'third space' between real and imagined') (Foucault, 1986), Soja's trialectics of 'Third Space' (Soja, 1996) to, more prosaically, 'A,B,C', 'top, middle and bottom', 'left, right and centre', *The Three Little Pigs* (Halliwell-Phillips, 1842), Dumas' *Three Musketeers* (1844), the Holy Trinity, a footballing 'hat-trick' and Anthony Gidden's *The Third Way* (1998). Its rejection of binary polarities and fixed structures and its exploratory focus on the dynamics of figurative and literal 'in between spaces' (Gehl, 1971) positions the research within the tradition of post-structural ideology, with specific reference to the work of Derrida, Lefebvre, Foucault, Soja, Baudrillard and Harvey, and to the theory and practice of Jane Jacobs and Jan Gehl.

At the core of the research sits the place/innovation nexus. The research is grounded in an observed tension between the dominant understanding of 'place' as a fixed and defined spatial and/or socioeconomic territory and the 'dynamic processes' (Oksanen and Hautamäki, 2014) of innovation ecosystems. With a particular focus on the role of 'place' in the development of the European innovation policy principle of Smart Specialisation (Foray, 2014) and the associated development of Smart Specialisation Strategies ('S3') as an *ex-ante* conditional requirement for EU member states, spatial analysis of the place/innovation nexus is founded on three typologies of 'innovation district' as asserted by Katz and Wagner (2014). Exploring the nexus through a cultural heritage lens adds a temporal 'fourth dimension' to the research and asserts 'time' as a, fourth, key concept. Both space and time are critical factors in the consideration of 'embeddedness', a common denominator in the place/innovation/cultural heritage triad and explored in the research in terms of its role in that central inter-relationship. Exploration of the spatial and temporal dynamics of the place/innovation/cultural heritage

relationship has also presented ‘light’ and ‘sound’ as key considerations within the conceptual framework.

The literature review is structured as a systematic exploration of each of those key concepts incorporated within, or pertinent to the research, namely: ‘space’, ‘place’, ‘culture’, ‘innovation’, ‘cultural heritage’, ‘embeddedness’, ‘light’, ‘sound’ and ‘time’ (listed here in sequential order). Its exploration includes critical responses to current innovation policy and practice, and it concludes with an overview of contemporary and emerging economic models as critical context for the stated research objectives of exploring and addressing the gaps in urban innovation frameworks and taxonomies.

Given the breadth, depth, scope and rich provenance of the concepts explored within the research, the literature review is necessarily broad, but seeks to balance an expansive exploration with a maintained focus on the key conceptual themes. It starts with ‘space’, which Nigel Thrift calls “the fundamental stuff of geography” (Thrift, 2003) and ends with time, which Courtney Campbell, in homage, calls “the fundamental stuff of history” (Campbell, 2016).

2.2 Space and Place

“What begins as undifferentiated space becomes place as we get to know it better and endow it with value. Architects talk about the spatial qualities of place; they can equally well speak of the locational (place) qualities of space. The ideas ‘space’ and ‘place’ require each other for definition. From the security and stability of place we are aware of the openness, freedom, and threat of space, and vice versa. Furthermore, if we think of space as that which allows movement, then place is pause; each pause in movement makes it possible for location to be transformed into place”. (Tuan, 1977)

The notion of ‘space’ and its definition, concept, structure, physical manifest, material forms, relational properties and existential meanings have a philosophical provenance stretching back to Ancient Greece, to Socrates, Plato’s *Timaeus* and Aristotle’s *Physics*. Fundamental to the physical universe, space features prominently in the works of Da Vinci, the discourse of the Renaissance and in the major works of physicists and mathematicians, including Newton and Einstein. Space is integral to a number of philosophical schools, featuring for example in the work of early 20th century structuralists such as Bertrand Russell, and later in Barthes, Derrida, Foucault, Baudrillard and the post-structuralists. Its literary provenance can be seen in the late

16th and early 17th century works of John Donne and the metaphysical poets and in the prominent spatial contexts of the 19th century Lake Poets (Wordsworth, Taylor-Coleridge) and the First World War poets (Owen, Sassoon, Brooke). It is a notion of significant and particular influence in 19th and early 20th century American literature, reflected and captured in Charles Olson's classic text in American studies, '*Call me Ishmael'* (1947), which opens: "I take SPACE to be the central fact to man born in America, from Folsom cave to now. I spell it large because it comes large here. Large, and without mercy" (Olson, 1947). The influence of space, both relating to the American landmass and as metaphor for 'The American Dream', can be noted throughout the modern American literary canon, from Melville's cartography of the Pacific coast and its ocean "spaces that before were blank" in *Moby Dick* (Melville, 1851/2012; Tally, 2009), to the evocative landscapes of T.S. Eliot's *The Waste Land* (1922) and F. Scott Fitzgerald's *The Great Gatsby* (1925), to the 1950's 'Beat Generation', Kerouac's *On the Road* and "all that raw land that rolls in one unbelievable huge bulge over to the West Coast" (Kerouac 1957).

As might be expected, both space and place are key tenets in geography, which has its roots as an academic discipline in the idiographic study of countries and continents and a typological, descriptive study of their landscapes. Like many of its artistic and literary counterparts, the scientific and academic merit of geography, and particularly the development of 'human geography' as a distinctly more qualitative branch of study, was called into question in late 1940s to mid-1950s America and subject to the scrutiny and censorship of McCarthyism (aligned with Cold War anti-communism and so-called 'Red Scare'), resulting in the cancellation of geography as a subject of study at Harvard, in 1948, and contributing to the 'Quantitative Revolution' (Adams, 2013) of the 1960s. The Quantitative Revolution marked a paradigm shift in academic discipline of geography, which saw the construct and adoption of laws, theories mathematical techniques and statistical modelling methods, recasting geography as a nomothetic 'spatial science'. Emphasising in particular the concepts of distance, direction and connection, this scientific approach conceptualised the idea of 'absolute space' (Massey, 1996) and of space as "objective, empirical and mappable" (Robinson, 1998).

A counter-revolution in the late 1970s, aligned with a rise in political activism and the emergence of the anti-war, environmental and human rights movements, foregrounded 'radical geography' as a prominent sub-field, which in turn gave rise to 'critical geography', a branch connected to Marxist, feminist, postmodern, post-structural, queer and left-wing ideologies. Critical geography is characterised by the rejection of empiricism and positivism, and an

acknowledgement of, and focus on, the spatial dynamics of power and oppression (Harvey, 2006). The work of Yi Fu Tuan has been pivotal in foregrounding human (and humanistic) geography as a key branch of critical geography and Tuan was among the pioneers, alongside Relph (*Place and Placenessness*, 1976), Buttimer (*The Human Experience of Space and Place*, 1976) and others, of elevating the concept of 'place' within spatial discourse. The 'spatial turn' in the decade which followed, a term denoting a perceptible shift in the arts, literary studies and the social sciences toward spatial analysis during the 1980s (Guldi, 2011), is observable in the work of Foucault, Lefebvre and Soja, a phenomenon which has since been further consolidated by the advent of digital mapping tools since the mid-1990s, notably GIS (Geographic Information System mapping), leading Crang and Thrift to observe that "space is the everywhere of modern thought" (Crang & Thrift, 2000).

Focussing on the human experience of and human relationships to, with and within place and space, Tuan's body of work explores humanistic approaches through a series of dialectics which include *Continuity and Discontinuity* (1984), *Morality and Imagination* (1989) and, notably *Space and Place* (1977). Tuan not only explores the differences between the dialectic poles, which in terms of spatial desires and spatial fears, he refers to as *topophilia* and *topophobia*, but the ambiguity, ambivalence, contradiction and paradox apparent in their intersect. "There is a certain distance", Tuan observes, "in what is nearby, and a certain nearness in what is far away" (Tuan, 1984). In *Space and Place*, Tuan explores what he describes as the 'opposing pulls' between space and place, and a related opposition between 'intimacy and distance' (Tuan, 1977). He describes a deeply subjective, sensory experience of space, positing that: "Human beings not only discern geometric patterns in nature and create abstract spaces in the mind, but they also try to embody their feelings, images, and thoughts in tangible material. The result is sculptural and architectural space, and on a large scale, the planned city". Place, he says, is "a type of object. Places and objects define space, giving it a geometric personality". (Tuan, 1977).

In his seminal work *Genius Loci: Towards a Phenomenology of Architecture*, Norberg-Schultz adopts a phenomenological perspective to place, proposing that: "the spaces where life occurs are *places*. A place is a space which has a distinct character. Since ancient times the genius loci, or spirit of place, has been recognized as the concrete reality man has to face and come to terms with, in his daily life. Architecture means to visualize the *genius loci* and the task of the architect is to create meaningful places, whereby he helps man to dwell" (Norberg-Schultz, 1979). Norberg-Schultz recognises that "the structure of a place is not a fixed, eternal state",

but also that stability and grounding, what he calls "*stabilitas loci"*, are a "necessary condition for human life" (Norberg-Schultz, 1979). Explicitly adopting a Heideggerean philosophy, *Genius Loci* explores Heidegger's concept of '*wohnen*' or 'dwelling', an exploration continued in Norberg-Schultz's *The Concept of Dwelling* (1984). "Man dwells when he can orient himself within and identify himself with an environment", says Norberg-Shultz, "or, in short, when he experiences the environment as meaningful." (Norberg-Schultz, 1979). This exploration of the inter-relationship between place and meaning marked the entire canon of Nordberg-Schultz research, to the extent that the terms were sometimes interchangeable. Drawing on Sedlmayer's *Verlust de Mitte* (Loss of the Centre) (1948), Norberg-Schultz's *Loss of Place* (1951) describes a situation in which a place's readability, navigability and understanding is lost through hyperdevelopment or modernisation. In short, *'Loss of Place'* is loss of meaning.

This negation of place, and meaning, is reminiscent of Augé's 'Non Lieux' in *Non places: An Introduction to an Anthropology of Supermodernity* (1992). Presenting the concept of 'supermodernity' as a late-capitalist phenomenon and consequence of excessive information and excessive space, Augé maps the distinction between *place*, "encrusted with historical monuments and creative social life", and *non-place*, in which "individuals are connected in a uniform manner and where no organic social life is possible" (Augé, 1992). Reminiscent of Foucault's 'heterotopias' (Foucault, 1986), these non-places are isolated, removed, anonymous and primarily transitory and include motorways, airports, shopping malls and hotel rooms. Exploring these non-places through the paradox that they both encourage and facilitate solitude, but regularly host many multitudes of people (in transit) Augé describes the non-place as "the opposite of utopia: it exists, and it does not contain any organic society" (Augé, 1992).

2.3 'In Between' Spaces, Post-Structuralism & The Third Space

The practice of exploration through dialectical opposites and the (figurative) spaces in between, of movement and dynamism in streets, squares and those (literal) 'in between spaces', and a foregrounding the human experience of space and place are also apparent in the work of both Jane Jacobs and Jan Gehl. In *Death and Life of Great American Cities* (1961), Jacobs describes the paradoxical, implicit order that comes from disorder of urban living: "Under the seeming disorder of the old city, wherever the old city is working successfully, is a marvellous order for maintaining the safety of the streets and the freedom of the city. It is a complex order. Its essence is intricacy of pavement use, bringing with it a constant succession of eyes. This order

is all composed of movement and change, and although it is life, not art, we may fancifully call it the art form of the city and liken it to the dance." (Jacobs, 1961). Similarly, Jacobs considers the paradox of increased privacy through increased density: "Under this system, it is possible in a city-street neighbourhood to know all kinds of people without unwelcome entanglements, without boredom, necessity for excuses, explanations, fears of giving offence, embarrassments respecting impositions or commitments, and all such paraphernalia of obligations which can accompany less limited relationship" (Jacobs, 1961). Jacobs advocates for 'four generators of diversity' in urban planning: mixed uses, short blocks, buildings of various ages and states of repair, and density. Her work champions 'eyes on the street', human-centred design, vitality, dynamism, diversity and "a fundamental belief that urban planners should discover the complexities and unique characteristics that determine *how* places work and enhance them, instead of writing policy to determine how a city *should* work." (Chantry, 2009).

Gehl, a 'self-confessed Jacobs disciple' (Gehl, 2018) describes Jacobs as 'the grandmother of humanistic planning' and credits her as the primary influence on his interest in designing to and with human scale: "Fifty years ago she said – go out there and see what works and what doesn't work and learn from reality. Look out of your windows, spend time in the streets and squares and see how people actually use spaces, learn from that, and use it. (Gehl, 2013). Recognised as a champion for reorienting cities toward design for pedestrians and cyclists (and away from automobile-centred design), Gehl's most prominent work, *Life Between Buildings* (1971) is presented in the form of a series of street 'vignettes' and associated observations through which he considers design quality, the uses and functions of public space, human pre-requisites such as the 'need for contact' and in which he sets out proposals and recommendations for optimal, 'desirable conditions'. In the section relating to quality of design, Gehl observes that:

" - When outdoor areas are of poor quality, only strictly necessary activities occur.
- When outdoor areas are of high quality, necessary activities take place with approximately the same frequency - though they clearly tend to take a longer time, because the physical conditions are better. In addition, however, a wide range of optional activities will also occur because place and situation now invite people to stop, sit, eat, play, and so on.
- In streets and city spaces of poor quality, only the bare minimum of activity takes place. People hurry home.

- In a good environment, a completely different, broad spectrum of human activities is possible" (Gehl, 1971).

There is an observable ideological correlation between Jacobs and Gehl's focus on streets and 'in between' spaces, Tuan's exploration between dialectical boundaries and the post-structuralist thinking and philosophy. Post-structuralism in effect looks beyond and in between Saussure's structural semiotics of 'signs and signifiers' (*Course in General Linguistics,* Saussure, 1916) to explore, for instance, their interaction with the concept of 'play' in Derrida's '*Structure, Signs and Play in the Discourse of Human Sciences'* (Derrida, 1972). Derrida's post-structuralist critique focusses on the idea of 'centring' in structural theory, denouncing the idea of a centre as paradoxical, in that while the centre of a structure must be related to all elements within the structure, it is also held to be fixed and inviolable, and noting the implicit 'binary epistemology' which in positioning something as fact, for instance 'truth', creates an 'other', for instance 'fiction', and further implies a 'periphery of meaning' which, Derrida posits, delineates a boundary of separation between the binary poles (Derrida, 1972). Poststructuralism maintains that all binary systems (truth/fiction, subject/object, real/unreal, God/man) are based on hypothetical constructs determined by social power dynamics which, in producing recognised 'centres' also create boundaries and margins. Much of Jacobs, and later, Gehl's work explores these perceived and real boundaries of urban spaces, and their marginalising effects on the people and communities within – and without.

Foucault's analysis of established binary constructs goes a step further to not only observe 'the other' and othering, as present in Derrida (also in Hegel, Freud, Husserl's 'alter-ego' (1931), Sartre's *Being and Nothingness*, 1943 and – notably – Lacan's 'big Other', 1955), but also to posit paradoxes inherent to and between the 'othered' binaries. In '*The Order of Things*' (1973), Foucault notes the dominance of 'Western' scientific ideas and practices since the 18th century and their resultant othering of 'non-normal' people, deemed in those terms to be insane or perverted. Foucault observes the positioning of 'Man' as both central and transcendent in this modernist paradigm, but notes a paradoxical contradiction in, for instance, the idea that 'Man' must conceive of both conscious and unconscious thought. Building on his key concept of 'discursive practice', that is articulations and communication of ideas and thoughts free of established binary understandings, Foucault introduces context as the basis for social and spatial discourse, finding historical layers and dynamics in establishing dominant discourses and norms. With regard to space, Foucault identifies a key shift in thinking to 18th Century

France as the naissance of politicised space (Foucault, 1980), that is spaces governed by social norms, a concept which he also explores in relation to his theory of 'technologies of the self', a term for those disciplines and procedures such as punctuality and dressing which have become normalised as socially governed aspects of an individual's life (conceiving of 'the self' as the smallest unit of space), what Foucault calls a 'modern performance' which, he says, is coerced by a power which is 'depersonalized, diffused, relational, and anonymous' (Foucault, 1980). Foucault's analysis of *heterotopias* (Foucault, 1986), 'other places' such as prisons, brothels, ships, cemeteries and bars, is aligned to the concept of utopias and dystopias and presented as an approximation or 'mirror' of a utopia, in order to allow the utopia to exist. Through using the concept of the mirror as a metaphor, Foucault creates a space that is at once real and imaginary (a reflection of a utopia, 'a placeless place'), articulating several types of heterotopias which exhibit this inherent duality, including heterotopias of deviation, such as prisons, where society places individuals in an alternative reality, and heterotopias of time, such as museums, which house objects from past times in the present (and future).

The discourse around real and imagined spaces is evident in the work of a number of post-structuralists, notably Baudrillard and his *Simulation and Simulacra* (1981), exploring multiple layers of copy, pretence and simulation in contemporary cultural and media referencing, moving cumulatively toward an expression as simulacra, of the *hyperreal* (Baudrillard, 1981). Baudrillard presents three levels of simulacra, attributing each to a particular historical period: the first order, attributed to the pre-modern period, with unique, real and 'irreproducible' objects and situations; the second order of modernity, the Industrial Revolution and mass-reproduction, and the third order of late-stage capitalism, in which the distinction between reality and representation disappears and originality has no meaning.

Foucault's influence in evident too in the work of Edward Soja, whose *Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places* (1986) draws on the spatial trialectics of both Foucault's concept of heterotopia, and Lefebvre's *Production of Space* (1974), in which Lefebvre proposes that space is a social product in which historical and current meaning is produced through a three-part dialectic between everyday practices and perceptions , or perceived space (*le perçu*), representations or theories of space, or conceived space (*le conçu*) and the spatial imaginary of the time, or lived space (*le vécu*). Soja synthesises Foucault and Lefebvre with other major influences including Homi K Bhabha's 'Third Space Theory', in which "all forms of culture are continually in a process of hybridity," that "gives rise to something different, something new and unrecognizable" (Bhabha, 1994) to introduce the

concept of 'Thirdspace' as "an-Other way of understanding and acting to change the spatiality of human life, a distinct mode of critical spatial awareness that is appropriate to the new scope and significance being brought about in the rebalanced trialectics of spatiality–historicality–sociality" (Soja, 1996). Soja describes thirdspace as "the space where all places are capable of being seen from every angle, each standing clear; but also, a secret and conjectured object, filled with illusions and allusions, a space that is common to all of us yet never able to be completely seen and understood" (Soja, 1996). It is an 'unimaginable universe in which "everything comes together… subjectivity and objectivity, the abstract and the concrete, the real and the imagined, the knowable and the unimaginable, the repetitive and the differential, structure and agency, mind and body, consciousness and the unconscious, the disciplined and the transdisciplinary, everyday life and unending history" (Soja, 1996), which can be reached and understood through the process of 'thirding', which "produces what might best be called a cumulative trialectics that is radically open to additional otherness, to a continuing expansion of spatial knowledge" (Soja, 1996).

2.4 Culture, Place and Placemaking

Of the three spatial characteristics identified in Lefebvre and later expanded in Soja, described in Lefebvre as "*firstly the physical nature – the Cosmos; secondly the mental, including logical and formal abstractions; and thirdly, the social*" (Lefebvre, 1991), both thinkers – perhaps unsurprisingly given their Marxist traditions - state their primary concern as being with the 'social' space (Lefebvre, 1991; Soja, 1996). Lefebvre's concept of social space points to the indivisibility of space and social power – from the ways that social relations are constituted in and unfold through spatial distributions, built environments, and spatial significations, to the ways that space itself is socially produced through relations of social power (Lefebvre 1991). This dialectic of space and social power, in which it is untenable to conceive of social relations (of, but not limited to, class, gender, race, sexuality and ethnicity) as falling outside of the spatiality through which they are practiced and reproduced in everyday life, can be seen too in Gregory's "geographical imaginations" (1994), Massey's "power geometries" (1994) and Harvey's *Geography of Class Power* (1998) (along with several others of Harvey's post-1990 works).

Arguably, similar dynamics of 'cultural power' relations exist alongside and related to identified social power structures and their spatial production, relation and flow. Bourdieu's signature theory of 'cultural capital' emerged from an essay on social reproduction, *Cultural*

Reproduction and Social Reproduction (1977) co-written with Jean Claude Passeron and was later expanded in *The Forms of Capital* (1986). Bourdieu's wider canon of work explores the concept of social dynamics which, he says, is established through the social norms of *habitus* (where an agent lives), the acquisition of forms of *capital* (cultural, social, economic) and their performance in socio-spatial *fields* (of class, power, hierarchy). He defines 'cultural capital' as the advantage an agent's education provides in achieving a higher status in society, marked by a "familiarity with the legitimate culture within a society; what we might call 'high culture" (Bourdieu, 1986).

The distinction between 'high' and 'low' culture is just one of the binaries at play in its definition, along with 'canonical' and 'popular', 'institutional' and 'lived', 'idealism' and 'materialism'. The cultural materialist Raymond Williams observes a shift in the 18th and 19th centuries, alongside the emergence of a 'civil society' which saw the term 'culture' "appropriated to distinguish between civilization and barbarism" (Williams, 1974) and further, pluralised to 'cultures' as in the work of Herder (often cited as the father of cultural relativism). Williams explores notions of high and low culture in their historical and social contexts, asserting that "high culture has no real social structure" and that "there can be no simple contrast between "high culture" (universal) and "popular culture" (local). This is because every available version of high culture is always, in the senses described, local and selective, and because, in the process of being made available in a real society, it includes (whether these are noticed or not) elements of the popular culture, in the widest sense, of its own society" (Williams, 1974). William's most famous text is also one of his earliest. In *Culture is Ordinary* (1958), he celebrates the culture of his Welsh heritage and the culture he experienced while at Cambridge University, describing culture as dually "a whole way of life" and "the arts and learning — the special processes of discovery and creative effort", asserting that: "Culture is ordinary; that is the first fact. Every human society has its own shape, its own purposes, its own meanings. Every human society expresses these, in institutions, and in arts and learning. The making of a society is the finding of common meanings and directions, and its growth is an active debate and amendment, under the pressures of experience, contact, and discovery, writing themselves into the land". (Williams, 1958)

While Williams (1958) puts forward a holistic vision of culture (as "a whole way of life"), binaries and their attached value biases persist in cultural studies. Brantefors (2015) identifies "two dominating values governing cultural relations, namely 'the culture of others' and 'the cultural heritage'. Despite the different rationalities over time, the cultural thinking never goes

beyond an unarticulated 'we' and a well-defined 'them'" (Brantefors, 2015). Adorno and Horkheimer introduce a further binary in their *Dialectic of Enlightenment* (1947), which they assert exists between 'industry' and 'authentic' culture, contending that industrially produced culture 'robs people of their imagination' and 'takes over their thinking'. 'The culture industry' is specifically distinguished from popular culture and mass culture in Adorno and Horkheimer's definitions and is presented as a tool of control used by the capitalist establishment to deceive the masses. Adorno and Horkheimer critique the commodification of art and lament how "amusement has become an extension of labour under late capitalism" (Adorno & Horkheimer, 1947).

Conversely, Fiske (1989) argues that "popular culture is not consumption, it is culture-the active process of generating and circulating meanings and pleasures within a social system", adding that "popular culture always is part of power relations. It always bears traces of the constant struggle between domination and subordination, between power and various forms of resistance to it or evasions of it, between military strategy and guerrilla tactics" (Fiske, 1989). Leon Hunt (1998) observes the emergence of an 'inverse snobbery' in the UK in the 1980s and 1990s, which he aligns with the film genre of social realism, in which 'low' culture has become those cultural aspects dismissed by both canonical and popular culture. Hunt observes a "new orthodoxy based on the intellectual assumption made by some students of popular culture that the symbolic experiences of ordinary people are more important analytically and politically than culture with a capital C" (Hunt, 1998). Hunt describes 'low culture' as "a doubly marginalised district within the popular" and identifies a 'Bermuda Triangle' of lost art dismissed as within this category (such as the '*Carry On'* films and Abba). Fiske (1989) also observes two dominant fields in cultural studies, based loosely on the championing and dismissal of popular culture, but also observes how "a third dimension has begun to emerge… one which sees popular culture as progressive (though not radical) and which is essentially optimistic, for it finds in the vigour and vitality of the people evidence both of the possibility of social change and of the motivation to drive it". (Fiske, 1989).

Bhabha's 'Third Space Theory' (Bhabha, 1994), from which Soja drew inspiration for the 'Thirdspace' concept, is particularly concerned with the notion of hybridisation, and specifically the effects of colonialism on new 'hybrid' cultural forms emerging through multiculturalism. Bhabha makes the distinction between cultural diversity and cultural difference, positing that diversity requires a culture to be a defined and pre-existing "object of empirical knowledge" while difference allows for cultures to be discovered, recognised and

‘enunciated’ (aligned with Foucault’s notion of ‘articulation’ in ‘discursive practice’) within the ‘Third Space’, without pre-existing knowledge. Bhabha’s ‘Third Space’ is an area of ambiguity and ambivalence, which “challenges our sense of the historical identity of culture as a homogenizing, unifying force, authenticated by the originary past and kept alive in the national tradition of the People” and “displaces the narrative of the Western written in homogeneous, serial time…through the disruptive temporality of enunciation… constructing new cultural statements and systems.” (Bhabha, 1994).

While there is, then, an explicit relationship with culture asserted in Bhabha’s theory (1994), Meskell-Brocken (2020) sets out a critique of contemporary approaches to the provision of arts and culture for young people in the context of Soja’s conceptual ‘Thirdspace’ (1996). Citing Soja’s observation that space and spatiality have been overlooked in favour of ‘historicality’ and ‘sociality’, resulting in “a spatiality peripheralised into the background as a reflection, container, stage, environment, or external constraint upon human behaviour and social action” (Soja, 1996; Meskell-Brocken, 2020), she offers aspects of ‘socially engaged arts practice’ and specifically Arts Council England (ACE)’s ‘Creative People and Places’ (CPP) programme as examples of an approach which holds spatiality in just such a peripheral. The CPP programme launched in 2012 as a vehicle through which to target ACE funding toward places across the country with below average levels of cultural engagement (defined by ACE as participating in three cultural events of experiences per year). Meskell-Brocken explores the paradox between CPP’s stated ‘place-based’ approach and the idea that any form of cultural engagement hosted in the place “but not necessarily of the place” might contribute to enhanced participation figures, and a further paradox that the creation of ‘thirdspaces’ through socially-engaged practice (a branch of the arts which takes place in a range of contexts and settings such as prisons, hospitals, schools and care homes) might reinforce the idea of othering away from traditional arts spaces such as galleries (Meskell-Brocken, 2020). She begins her paper by referring to ‘placemaking’ as “a recent buzz term in the UK arts and cultural sector as a way of describing the implantation of arts activities into communities that are perceived to be ‘socially excluded’, ‘deprived’ or any such deficit loaded term” (Meskell-Brocken, 2020). Here, her critique is reminiscent of the work of Stephen Pritchard, who has put forward the concept of ‘Artwashing’ to describe “how art is used as a gloss for dispossession, displacement and ultimately social cleansing” (Pritchard, 2017). Pritchard describes socially engaged art as “a way of instrumentalising artistic practices in the name of state, corporate and other agendas” (Pritchard, 2017), and contends that:

"Certain forms of art – for example public art and socially engaged art – have secured a place within the global urban economy as powerful placemaking tools; strategic policy devices capable of 'improving' places, people and, ultimately, economies. I argue these artistic practices, with their claims of community empowerment and social engagement, when deployed in areas undergoing or under threat of displacement of working-class and ethnic minority residents, become the artistic fin above the water; the creative industries, the state and the corporate investors form the rest of the shark lurking below. In such circumstances, art becomes artwashing". (Pritchard, 2019)

Returning to Jacobs and Gehl, both of their work is highly influential in the field and practice of 'placemaking'. Placemaking is described by one of its chief proponents, the Project for Public Spaces (PPS) as "a collaborative process by which we can shape our public realm in order to maximize shared value" (PPS, 2007). PPS, who adopted 'placemaking' as an overarching term for its practice in 1991, advocates for 'Lighter, Quicker, Cheaper' intervention, which "views a place in its entirety" and which champions "function over form" (PPS, 2007). Like its root of 'place', the notion of placemaking has been rapidly integrated into policy and practice, with a particular boom in the post-2008 crash years, despite an inchoate definition and conceptual incompleteness. Placemaking is described by Legge (2015) as having a "mirage"-like quality, which "is why it is so attractive to so many" (Legge, 2015). It is this incompleteness which compelled The Royal Society of Arts (RSA) to posit the questions: "In the act of placemaking, who or what is doing the making? Who should be?" (RSA, 2015).

Describing placemaking as "the shared reclamation of space" (and in notably more positive terms that Pritchard and Meskell-Brocken), Wouter Jan Verheul (2017) arguably gives his answer to the RSA's questions when he describes how "Creating or improving public space is a challenging task for anyone whose work is related to the city: from social workers to property developers, from architects to city marketers" (Verheul, 2017). Verheul describes how placemaking is supported by a "triangular relationship between governments, the business community and civil society" and posits that there are three discourses of public space: public space as a free meeting space or *agora* (Habermas, 1962; Hajer & Reijndorp, 2001), public space as a frictionless transition space (Le Corbusier, 1929; Garland, 2000) and public space as a theme-driven consumption space, characterised as a theme-park (Sorkin, 1992) or 'McDonaldisation' (Ritzer, 1996). As the 'shared reclamation of space', Verheul asserts placemaking as the effective antidote to Zukin's observation that "places are turning into everywhere else" (Zukin, 2010) and Augé's "non places" (Augé,1992). Verheul puts forward

four forms of placemaking: *social* placemaking, focussed on social tasks and community building (through, for example, communal baking and eating), *cultural* placemaking, "in which a place is given new identity", *economic* placemaking, focussed on "increasing the value of a place and its surroundings", and *innovative* placemaking, a sub-set of economic placemaking, focussed on "the idea that a diversity of people with their own knowledge and competences will lead to new innovations and that public space will play a major role", citing The Hague's Central Innovation District, a collaborative project between the Project for Public Spaces (PPS), The Delph University of Technology and The Brookings Institute's Bass Initiative, as an exemplar of innovative placemaking (Verheul, 2017).

2.5 The Emergence of Place in Innovation Frameworks

A portfolio of work from The Brookings Institute's Bass Initiative has been pivotal in framing current thinking around the interconnectivity between innovation and place.

Innovation, defined in the Organization for Economic Cooperation and Development (OECD) as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (OECD, 2005) has, as noted in Kotzemir et al (2013), "evolved as a synonym for the development of nations, technological progress and driver of business success. Innovation nowadays is not simply the 'creation of something new' but also a panacea for the solution of board range of problems" (Kotzemir et al, 2013).

Kotzemir's observance of the conceptual evolution of innovation as "a synonym for the development of nations" and driver of "success" (ibid.) reveals and underscores a fundamental structural problem with orthodox innovation frameworks, namely that these frameworks are manifest at a national level and played out on a competitive world stage. So-called 'National Systems of Innovation' (NSI) (Freeman, 1982) emerged in the early 1980s, during a period of elevated geo-political tensions referred to as "the new Cold War" (Halliday, 2001). Contextualised by the latter years of 'The Space Race' (Halliday, 2021) and what Godin (2002) calls a "Western fascination with the technological and economic performance of Japan", the NSI model was introduced as a successor to the linear model of innovation, a tripartite framework conceptualised as invention, innovation and diffusion (Godin, 2006), based on supply ("technology push") and demand ("market pull") drivers and a direct flow between "from scientific discovery, through technological development in firms, to the marketplace"

(Rothwell, 1994). Defined as "a set of institutions whose interactions determine the performance of national firms" (Nelson, 1993), the NSI framework was conceptualised as bringing private sector, academic and public institutions together (Nelson, 1993), with a strong emphasis on the relationships between institutions and sectors (Godin, 2006) and a thematic focus on the "techno-economic" paradigm (Freeman, 1987).

NSIs have been a mainstay of OECD policy (see OECD, 1997) since the late 1980s and remain the dominant framework for public investment in innovation (see UK Government's 'Leading the Future by Creating It' Innovation Strategy, 2021), in an approach "totally defined in terms of and devoted too innovation as commercialisation of technological invention" (Godin, 2007). Foray, acknowledged as a pioneer of thinking around the knowledge-based economy (Foray, 2000) and whose later body of work has been so influential in the conceptualisation and development of the European Commission's 'Smart Specialisation' (S3) policy (Foray 2009; 2015; 2020) dismissed the OECD's developmental work on NSI's as "neither strikingly original nor rhetorically stirring" (Foray, 1995), citing a persistent ignorance of the role of knowledge distribution in innovation, and a failure to develop performance indicators as key limitations. Foray's development of the concept of S3 (See 2.5.1, 2.5.2, 2.5.3) represents a turning point in the inter-relationship between innovation and place, incorporating a requirement for a "mid-level granularity" within S3's five component principles of "entrepreneurial discovery, mid-level granularity, inclusiveness, an expectation of progress (specifically that priorities will not be supported forever) and the promotion of experimentation and risk" (Foray, 2009). Ketel's 2013 review of S3 policy and application for the European Commission has been pivotal too in its call for "an accent on regional embeddedness" (EC, 2013) and regionally distinct, place-based approaches to S3, as opposed to "place-blind interventions" (EC, 2013).

While Ketel's review also identifies a "tendency for regional strategies to chase the same "bandwagon" sectors" (EC, 2013) as a key S3 policy flaw, citing "the race to be the next Silicon Valley" as a prevalent problem, the "corporate campus" model (Katz & Wagner, 2014) adopted in Silicon Valley has influenced a tendency toward spatial agglomeration in place-based approaches, exemplified by the phenomena of what The Brookings Institute calls "The Rise of Innovation Districts" (Katz & Wagner, 2014). Katz and Wagner (2014)'s seminal portfolio of work defines innovation districts as "geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators and accelerators", asserting a typology based around three models of emergent 'innovation districts' in cities: the

‘anchor plus’ model, in which a clustering of assets and infrastructure occurs around the presence of an anchor institution, such as a university; the ‘re-imagined urban areas model’, in which former industrial or warehousing sites undergo large-scale regeneration (often, Katz and Wagner observe, to be found in historic waterfront districts); and the ‘urbanized science park’ model, which sees new industry and commercial activity in suburban or ex-urban areas growing around clustered scientific activity (Katz & Wagner, 2014).

In a later review of this predominantly spatial analysis of innovation strategy, Katz, Vey and Wagner (2015) introduce “the imperative to combine and activate physical assets in ways that create vibrant “places”, quoting Ethan Kent, Chief Executive of the Project for Public Spaces (PPS)’ description of place as “environments in which people have invested meaning over time. A place has its own history—a unique cultural and social identity that is defined by the way it is used and the people who use it.” (Katz, Vey and Wagner, 2015)

Rissola’s 2017 paper for the EC on ‘Place-based Innovation Ecosystems’ (Rissola et al, 2017), explores, as its title suggests, marks a shift in thinking in European policy toward the notion of the ‘ecosystem’ and its inherent dynamics. Rissola’s report emphasises the territorial aspects of *what* place-based innovation means (his emphasis), and asks three core questions: “Why does innovation take place in certain places and not in others? Which are the contextual conditions and public interventions enabling such innovations to happen in a specific site?” and later, noting the dynamic process “often not easily recognisable from outside — that makes such innovation ecosystems develop” asks “the question who those sustaining such a process are”. (Rissola et al, 2017). Citing Oksanen and Hautamäki’s definition of an innovation ecosystem: “An innovation ecosystem consists of a group of local actors and dynamic processes, which together produce solutions to different challenges” (Oksanen and Hautamäki, 2014), the report highlights the criticality of social networks and contexts (including resonance with a place’s heritage context) and, using Aalto University and the Otaniemi-Keilaniemi-Tapiola innovation district, both located in Espoo, Finland as an exemplar case study, Rissola et al attribute a pivotal role to ‘entrepreneurial universities’ as facilitators of a dynamic ecosystem. With regard to the host city of Espoo, the report notes that a number of “open and collaborative innovation structures (living labs, fab labs, social innovation networks, open data labs, etc.)” have emerged in the city and, further, that:

“The target area (Espoo) is highly digitised, leading to opening up innovation processes, open innovation, and more broadly, a democratisation of innovation. Linear models of innovation

are giving way to systemic and collaborative models that enable the inclusion of users from the very start of the innovation process, increasing the effectiveness of the impact generated by investment in R&I. The collaboration of all stakeholders under a quadruple helix paradigm (companies, research and innovation centres, the public administration and citizens) in the design and implementation of innovation strategies not only echoes democratisation but makes strategies stronger in terms of adequacy to local needs and societal challenges, thus serving better the purpose of territorial socio-economic development". (Rissola et al, 2017)

Rissola's report concludes with recommendations for adoption of the '4H quadruple helix stakeholder model' (incorporating government, academia, industry and civil society) within planning and policy processes for Smart Specialisation strategies (S3), noting a particular importance in balancing the 'top down' and 'bottom up' elements of the 4H stakeholder model and highlighting findings from Aalto/Espoo as "particularly instructive for the JRC's forthcoming project on Higher Education for Smart Specialisation", which "analyses how universities and other higher education institutions can be better integrated into the policy mixes of smart specialisation strategies" (Rissola et al, 2017). The research portfolio of the MAPS-LED international and inter-disciplinary research team, which contributed to Rissola's 2017 report, presents a significant body of work on application of the 4H model in the case of Boston, proposing a "new generation" of urban innovation centres, which Monardo (2018) refers to as "turbines of smart strategy".

2.5.1 Smart Specialisation

Smart Specialisation is a central concept in the European Commission's vision for Europe's innovative future (EC 2016). Smart Specialisation has both a conceptual and policy strategy meaning (Hassink & Gong, 2019). Its conceptual meaning is "the capacity of an economic system (a region for example) to generate new specialities through the discovery of new domains of opportunity and the local concentration and agglomeration of resources and competences in these domains" (Foray, 2015).

The development of the concept as a principle for strategic planning and policy making emerged initially from the work of the European Commission's Knowledge for Growth Expert Group (K4G), which was tasked with exploring and putting forward solutions to the 'productivity gap' between the EU and the USA. Having identified "fragmentation of public research systems" and a "duplication of knowledge bases (every region focusing on the same

high-tech industries)" as key issues (Foray, David, & Hall, 2009), the concept of Smart Specialisation was introduced with the view to promoting R&D and innovation and explorative, research activities with the potential to transform existing regional economic structures (Foray, 2015). Smart Specialisation strategy (S3) is defined as "a policy process which should lead to the selection of future priority domains through entrepreneurial discovery" (Foray, David, & Hall, 2011).

S3 translates the concept of Smart Specialisation into policy, allowing regions to prioritise concentration of resources as the basis for competitive advantage. The S3 approach is based on five core design principles: entrepreneurial discovery, mid-level (predominantly regional) granularity, inclusiveness, an expectation of progress (specifically that priorities will not be supported forever) and the promotion of experimentation and risk (Foray, 2009). The rapid rise of Smart Specialisation from academic theory to policy strategy to legal requirement has arguably mirrored its own design principles. It is in essence an experimental strategy, which itself has made extraordinarily fast-paced and dynamic progress, benefiting from and contributing to a focus on entrepreneurialism, innovation, experimentation and inclusion, and progressing alongside the growing movement toward regional, devolved and 'place-based' development (Devaney, 2016).

Smart Specialisation is now firmly established as a key feature in European innovation policy. Since 2013, it has been a compulsory ex-ante conditionality requirement for EU member states and regions accessing EU funds to have an S3 in place (EC 2013a).

In a 2020 paper, Foray, whose body of work has been integral in the development of Smart Specialisation as both concept and policy strategy reflects on learning from the EC's 'S3 Platform', specifically focussing on the nature and manifest of 'entrepreneurial discovery' which, he says "has been used from the beginning to highlight the bottom-up component of the S3 approach…(and)…has become very popular in policy-making circles—although it sometimes comes across more as bureaucratic jargon than an effective policy practice." (Foray, 2020). Foray identifies three core stages in the S3 process, which can be described as prioritisation, transformation and improvisation (author's elaboration), the third stage of which, he suggests, "leaves regions the freedom to invent their own approach" and is "inspired by the idea of a script: the three steps approach represents a set of simple rules like those a theatre director gives an actor who is asked to improvise concerning a certain theme." (Foray, 2020). Calling for more specificity around 'entrepreneurial discovery' and how it is applied in S3,

Foray identifies three types of discovery: *entrepreneurial discovery*, "related to market economies" (Kirzner 1997), *self-discovery*, "an important coordination logic in economic development" (Hausmann and Rodrik, 2002), and *a voyage of discovery*, "as proposed by Hirschman (2015) to describe and analyse economic coordination at project level in a context of high supply and demand uncertainty" (Foray, 2020). Foray notes that the majority of S3 approaches attempt to employ entrepreneurial discovery at all stages of the process when, he posits, "the Hirschman expression of a voyage of discovery is perhaps better suited for step 3" – characterised here as 'improvisation' - "in which projects are developed" (Foray, 2020).

2.5.2 Critique of Smart Specialisation and S3

Although both the concept of Smart Specialisation and its application to policy and strategy have been subject to an almost constant process of review and evolution (not least through the work of Foray himself), there has been in recent years, and particularly in the current context as Europe seeks to devise and articulate an overarching strategy for innovation and R&D as a successor to Horizon 2020, increased critique of Smart Specialisation and S3 (Capello & Kroll, 2016; Hassink & Gong, 2019; Benner, 2020). This has sat alongside and punctuated calls for a broader approach to innovation policy more generally, and specifically a view that S3 has done little to change the so-called "European regional innovation paradox" (Uyarra et al, 2018), referring to the disparity between the need for innovation in structurally weak regions and their limited capacity to absorb and utilise innovation funds (Hassink & Marques, 2016; Marques & Morgan, 2018; Papamichail, Rosiello, & Wield, 2019). Schot and Steinmuller (2018) suggest that there have been two dominant frames for innovation policy – a post-war focus on science and R&D ("Innovation 1.0") and "national systems of innovation" ("Innovation 2.0"), proposing, as "Innovation 3.0" that "a third frame is in the making – transformational change". Innovation 3.0, the authors suggest, focusses on socio-ecological innovation policy and the explicit mobilization of science, technology and innovation for meeting societal needs, solve grand challenges (Mazzucato 2017; 2021) and addressing the United Nation's Sustainable Development Goals (Schot & Steinmueller, 2018).

In 2019, Hassink and Gong put forward their paper *Six Critical Questions about Smart Specialisation*, positing that there is and remains a persistent confusion around the concept, that S3 is predicated on the "conventional science and technology model of innovation and regional economic development", that there is a lack of clear distinction between S3 and cluster

policy and that there remains a need for more rigorous (and they note, qualitative) methods of evaluation and measurement. The authors describe a "delusional transformative hope" in what they regard as a "locked in" entrepreneurial discovery process which, they posit, offers little to address existing structural weaknesses in economically deprived, peripheral, 'left behind' regions and their "low absorptive capacity for innovation" (Hassink & Gong, 2019).

Foray (2019) issued a paper in direct response to Hassink and Gong's critique, highlighting a process of continuous learning over ten years (since the K4G group's report) and restating a belief in "transformation through knowledge, innovation and bottom-up discovery" as S3's "raison d'être" (Foray, 2019). Foray's response has been met in return by a paper from Benner (2020), positing six further 'critical questions', with particular reference to an S3 discourse "overly focused on research and development", inappropriate spatial scales and a misplaced focus on branding and policy at the expense of process and implementation (Benner, 2020). Foray's paper in direct response, '*Six additional replies – one more chorus of the S3 ballad*' (Foray, 2020) accuses Benner of "confusing theory and implementation" and specifically of putting forward criticisms which relate to Smart Specialisation as a theoretical concept but positing those criticisms as a critique of S3 strategies and their implementation (Foray, 2020).

2.5.3 Place and S3

Place is implicit in the level of granularity required by S3. While there is clear ideological synergy between the regional focus of S3 and the place-based approach, "Smart Specialisation Strategies…were initially developed from an a-spatial concept (and) have needed to be reworked and redefined in the context of regional analysis" (EC, 2013). The EC's 2013 report on S3 and cluster policy, based on the findings of a special advisory group chaired by Ketels advocates for regionally distinct, place-based approaches to S3, as opposed to "place-blind interventions", setting out a desired logic for S3 delivery which prioritises regional context, participation and ownership and place-specific future visioning. The report identifies a lack of stakeholder engagement, insufficient analysis of regional assets and a "Tendency for regional strategies to chase the same "bandwagon" sectors" (EC, 2013) as key S3 policy flaws.

The co-relation between place and S3 is made explicit by the 2009 Barca report (and restated by McCann, 2015). The Barca report defines a place-based approach as "a long-term strategy aimed at tackling persistent underutilization of potential and reducing persistent social exclusion in specific places through external interventions and multi-level governance" (Barca,

2009). Whilst this is a useful definition, and of its time, both S3 and place-based concepts have since continued to evolve, and whilst the concept of 'place' remains "incompletely developed" (RSA, 2014), in emerging just ahead of the place-based paradigm, S3 has been able to respond to and absorb a deepening understanding of what 'place' means.

2.5.3.1 Place, S3 and Cultural Heritage

Place-based innovation, and S3, tends to focus on the acknowledged strengths of a place. Often, these strengths are so acknowledged because they have a basis in a place's industrial or cultural heritage (as noted in Rissola, 2017). Greater Manchester (GM), for example, focussed its 2013-20 'S3' strategy on pioneering innovative models of advanced manufacture in its work with Graphene, building on its recognised historic strength in manufacturing.

As with the dominant understandings of 'place', heritage tends also to be characterised as a fixed and static concept, based primarily on the 1972 UNESCO World Heritage Convention definition of 'cultural heritage' as monuments, groups of buildings and sites (UNESCO, 1972). The ICOMOS Nara Document (1994) calls for cultural context in regard to permanence, recognising, for example, the cultural heritage value - but impermanence - of ritually rebuilt wooden temples and mud huts (and, for an instance of significant scale, the temporary cities built as part of the Hindu Kumbh Mela festival celebrations), pioneering a school of thought which has since introduced a more fluid understanding, particularly in regard to cultural heritage, and which was underscored by the formal recognition of 'intangible cultural heritage' by UNESCO in 2003. UNESCO defines intangible cultural heritage as "traditions or living expressions inherited from our ancestors and passed on to our descendants, such as oral traditions, performing arts, social practices, rituals, festive events, knowledge and practices concerning nature and the universe or the knowledge and skills to produce traditional crafts", and asserts that its protection is integral to maintaining cultural diversity and supporting cultural dialogue. UNESCO highlights that intangible cultural heritage can be past or contemporary, is inclusive and representative and community based. It "can only be heritage when it is recognized as such by the communities, groups or individuals that create, maintain and transmit it – without their recognition, nobody else can decide for them that a given expression or practice is their heritage" (UNESCO, 2003) This thinking continues to influence contemporary cultural heritage research, such as the Royal Society of Arts' advocacy for

community-based ‘Networked Heritage’ and ‘Heritage Citizens’ in its portfolio of work around ‘Heritage, Identity and Place’ (RSA, 2017a).

The relationship between cultural heritage and innovation is a relatively fresh research domain. From a policy perspective, where a relationship is noted, the focus tends to be on the economic value of cultural heritage, principally through tourism. The report of the EC Horizon 2020 expert group on cultural heritage (EC 2015) sets out a framework for cultural heritage in Europe. The report asserts that “modest investment in cultural heritage can pay substantial dividends… economically but also in terms of improving environmental sustainability and social cohesion.” (EC 2015) and argues that “the European Union should vigorously promote the innovative use of cultural heritage for economic growth and jobs, social cohesion and environmental sustainability.” (EC 2015). Notably, the focus here is on ‘innovative use’ of culture to generate value, rather than the inherent value of culture, or cultural value as a driver of innovation.

2.6 Embeddedness

A common denominator between place, S3, culture and heritage can be found in the concept of ‘embeddedness’. Ketels, as previously noted, calls for ‘an accent on fostering regional embeddedness’ (EC, 2013) in his 2013 review of European S3 and cluster policy. The call is made in mitigation of a number of noted policy flaws, principally the tendency for regions to choose ‘bandwagon’ sectors, such as digital and bioscience, as S3 specialisms. Ketel’s call marks a pivotal point in the development of S3, and in the developing ‘place’ paradigm, as both move from superficial ‘place-based’ strategies to strategies ‘embedded’ and demonstrably grounded in place.

The concept of ‘embeddedness’ is widely attributed to the work of Karl Polanyi, principally *The Great Transformation* (1944), although a number of commentator’s also point to its occurrence too in the earlier work of Polanyi’s contemporary, Richard Thurnwald (see Beckert, 2007). Polanyi’s substantivist model of ‘embeddedness’ asserts that rather than being manifest as a separate and distinct sphere, the economy is ‘embedded’ not just in economic institutions, but in all manner of social and cultural norms, moral concerns, politics and religion. Polanyi’s model is based on non-capitalist, pre-industrial economies which, he says, are based not only on market forces, but also on redistribution and reciprocity. In one of only two occasions which Polanyi explicitly mentions the term, he describes the importance and nature of ‘bartering’ and long-term relationships in embedded exchange systems, observing that: “In the vast ancient

systems of redistribution, acts of barter as well as local markets were a usual but not more than a subordinate trait. The same is true where reciprocity rules: Acts of barter are here usually embedded in long-range relations implying trust and confidence, a situation which tends to obliterate the bilateral character of the transaction" (Polanyi, 1944).

Returning to Ketel's call for 'embeddedness' in S3 (Ketels, 2013), there is some tension between fixed (spatial and socio-economic) definitions of 'place' and the historical anchoring and institutional (church, state) dominance present in the substantivist paradigm of 'embeddedness' on the one hand and the 'dynamic processes' of 'innovation ecosystems' (Rissola et al, 2017) and the short-term risk taking and learning, regenerative shedding and re-definition of priorities that is actively encouraged in the process of Smart Specialisation (Foray, 2015) on the other. This regenerative process in support of economic systems has a long and rich provenance, dating from Schumpeter's "gale of creative destruction", the "process of industrial mutation that incessantly revolutionizes the economic structure from within" (Schumpeter, 1942) and its rise to policy prominence in the 1950s. More recently, Schumpeter's influence can be seen in Harvey's 'spatial fix' (2001), Castells' 'space of flows' (2010), and in the explicit incorporation of 'creative destruction' as a key driver in Smart Specialisation itself (Foray, 2015). The tension arises when these spatial dynamics are considered alongside the deep and immovable social, historical and moral structures asserted as foundations of 'embeddedness' in the substantivist model.

A better fit can arguably be found in the sociological, neo-substantivist paradigm around embeddedness brought forward by Granovetter (1985), the central tenet of which is based on the theory of individual economic agency being "embedded in concrete, ongoing systems of social relations" (Granovetter, 1985). Granovetter introduced this understanding in direct reference to an ongoing debate between substantivists and formalists in economic anthropology (Schneider 1974) and two competing concepts of action in sociology, in which actors where either 'undersocialized', isolated economic units or 'oversocialized', entirely controlled by social norms. Granovetter's definition, put forward as a 'third' alternative, promotes a structuralist economic sociology in which economic outcomes are explained by the structural ('concrete') properties of social networks (Becker, 2007).

Becker, 2007 observes that Granovetter's central idea of 'the network' "has become the most influential advance within the new economic sociology" but argues that this understanding of 'embeddedness' is far removed from the original meaning of the term put forward by Polanyi.

Polanyi's work, Becker says, is "rooted in institutional analysis" (Becker, 2007). In short, Polanyi's work explores networked relations between institutions, while Granovetter's definition focuses on the network itself. The delicate balance present in Granovetter's definition, in which networks of social relations are at once concrete and dynamic, resonates well with the required – and in some cases, evident - relationship between place and innovation. Application of this more fluid and arguably culturally aware definition of 'embeddedness' has implications for the understanding of both 'place' and 'innovation', and challenges activity emerging within the place/innovation nexus to respond.

2.7 Spatial and Sensory Dynamics - Light and Sound

Resonance can arguably be found too between this more fluid conceptualisation of embeddedness and the concept of 'embodiment', used by humanistic geographers (notably Thrift, 2003) to describe a 'bodily geography', both in terms of the physical interrelationship between the human body and place (Holloway & Hubbard, 2001) and to denote the multi-sensory experience of space – and place - through "visual, aural and tactile elements, as well as tastes and smells" (Hubbard & Kitchin, 2010). Thrift argues that "Space is not incidental, but rather a vital part of what it is to be human: an enframing that allows the incubation of different ways of life by extending extension. Human being is about constructing surroundings in which such atmospheres can be reliably conjured up and replicated. Human sociality therefore *always* co-evolves with objects and space that provide more or less room to become something else" (Thrift, 2014). Citing Galloway, 2012 and evoking Baudrillard's notion of the 'hyperreal' (Baudrillard, 1981), Thrift describes this co-evolution through light, from candles to gas-lights to electric lighting to the 'smart city' and its "contemporary aesthetics of light and radiance which is prominent in registers as diverse as the internet and social networking, new means of programmable urban lighting, the glow of high-definition screens, and, most importantly, as a means of re-objectification with the aim of producing a continuous reel of experience based initially upon a cinematic principle but now gradually spooling into something else which is continually both recording and being recorded" (Thrift, 2014).

Citing Tanizaki's assertion that society has become 'benumbed' and "utterly desensitised to the evils of excessive illumination." (Tanizaki, 1997), Sandy Stannard's *Designing with Light* explores "light as a building material" (Stannard, 1998). With echoes of Le Corbusier's "Space and light and order. Those are the things that men need just as much as bread and sleep", and

his definition of architecture as "the masterly, correct and magnificent play of masses brought together in light" (Le Corbusier, 1927/1986), Stannard (1998) captures the fundamental interplay in the relationship between light, shadow, space and structure when she writes: "Light and shadow are the primary means by which we perceive and understand the world around us. In architecture, space is defined and comprehended by our perception of light and shadow. At the same time, light and shadow are appreciated and best understood as they intertwine with architectural form" (Stannard, 1998).

Sound too plays a role in spatial perception and dynamics. While visual sense is dominant over aural (as demonstrated by the 'Coalavita Effect', 1974 – see Koppen & Spence, 2007), Voss (2016) explores the phenomenon of 'spatial hearing' in blind and visually impaired people, and specifically observes enhanced egocentric spatial cognition (a sense of where the body is in relation to its environment) and enhanced sensitivity to binaural sound location cues (Voss, 2016). While Stannard (1998) identifies a sensory preference to light over sound in architectural forms (a similar sentiment expressed by Tadao Ando in his 1984 work *Buildings, Projects and Writings*: "I do not believe that architecture should speak too much. It should remain silent and let nature in the guise of sunlight and wind speak"), Jablonska et al (2015) assert a fundamental inter-existence: "Sound exists in architecture and architecture exists in sound" (Jablonska et al, 2015). Avidar et al (2009) explore the inter-relationships between space, sound and form, acoustics, dynamics and 'aural architecture', positing that "Sound is a spatial event, a material phenomenon and an auditive experience rolled into one. It can be described using the vectors of distance, direction and location. Within architecture, every built space can modify, position, reflect or reverberate the sounds that occur there. Sound embraces and transcends the spaces in which it occurs, opening up a consummate context for the listener: the acoustic source and its surroundings unite into a unique auditory experience" (Avidar et al, 2009).

The space/sound/form relationship has been explored variously in contemporary culture, with prominent examples including Brian Eno's body of work in ambient music (a genre which he describes in the sleeve notes to *Ambient 1: Music for Airports*, 1978 as "music intended to induce calm and a space to think", adding that it "must be as ignorable as it is interesting"), Phillip Glass' musical score to accompany Godfrey Reggio's 1982 film *Koyaanisqatsi: Life Out of Balance,* one of a trilogy of visual 'tone poems' from Reggio exploring the relationship between humans, urban and natural landscapes and technology, which includes time lapse scenes of construction and demolition, and William Basinski's *Disintegration Loops* (2002), a

sonic recording of gradually disintegrating tape loops which Basinski then set as the score to a short film taken of destruction to the urban landscape following the 9/11 attacks, as viewed from his apartment building in central New York.

In *Rythmanalysis: Space, Time and Everyday Life*, co-written with his wife Catherine Regulier, published posthumously in 1994 (and in English in 2004) and considered the fourth volume in his *Critique of Everyday Life,* Henri Lefebvre puts forward his concept of rhythms, temporal patterns present in urban spaces and in the inhabitants of those spaces. Positing that "Everywhere where there is interaction between a space, a time and an expenditure of energy, there is *rhythm*" (Lefebvre & Regulier, 1994/2004), Lefebvre begins his work with a refusal to "isolate an object, or a subject, or a relation", but instead "to grasp a moving but determinate complexity" (Lefebvre & Regulier, 1994/2004). Lefebvre severally reiterates his objective as to investigate the 'time-space-energy' triad without synthesis, fusion or abstraction, allowing for a 'singular logic' for each rhythm, while also exploring their relation across four elements: *arrythmia* (conflict or dissonance), *polyrhythmia* (separate co-existence), *eurhythmia* (constructive interaction) and *isorhythmia* (balance, harmony). He asserts two main types of rhythm, *cyclical* (natural, cosmic and vital – correlating with rural living) and *linear* (imposed by imposed by technology, industry and consumption – correlating with urban living), across four forms: *secret* (physiological, psychological, unconscious), *public* (social, shared), *fictional* (gestures, cultural norms) and *dominating-dominated* (arbitrary, but adopted). Lefebvre is explicit in his critique of the 'quantified' linear time of capitalism, which he describes as 'homogeneous', 'fragmented', 'monotonous, tiring and even intolerable', bringing about "lassitude, boredom and fatigue" (Lefebvre & Regulier, 1994/2004).

In *Marx, Capital and the Madness of Economic Reason* (2017), David Harvey describes capitalism as 'the annihilation of space over time' (Harvey, 2017). He notes a particular paradox to be found in "fixed capital" which, Harvey says, "engages the labour of future use. Embedded in the land, it must be used in situ if it is to be redeemed over time. The very form of flow designed to liberate capital therefore ends up directing the flow back into that space*"* (Harvey, 2017). Harvey describes three typologies of spatiotemporal value flows: linear, cyclical and capital, characterising the last of these as 'the downward spiral of globalisation' and describing it as "representing the capital flow of anti-value based on the accumulation of debt as a claim on future labour" (Harvey, 2017*).*

2.8 Time – The Fourth Dimension

Like space, time has been the subject of literary, cultural, scientific and philosophical investigation since ancient times. The 'wheel of time' concept, present in a number of religions including Hinduism and Buddhism, emerged in ancient Indian thinking, such as the *Veda* texts dating from approximately 2000BC, which assert that the universe goes through repeated cycles of creation, destruction and rebirth. In Greek mythology, Khronos was venerated as the personification of time and often represented as an aged man (adopted in later folklore as 'Old Father Time'). The prominent belief in Ancient Greek philosophy was that time was conceptual, unreal or illusionary, as explored by Antiphon, Parminedes and Zeno (the latter through his 'Paradoxes'), although a number of contemporaries also considered 'real' and material time, such as Heraclitus' description of time as 'the essence of reality'. Plato believed in creationism and regarded time as a creation from God (the basis too for St. Augustine's later descriptions of time and 'divine eternity') but also put forward the idea of time as a movement between celestial bodies. Plato's student Artistotle believed in infinite time, (a non-creationist position), setting time out in the linear past-present-future and regarded time as a quantified ('numbered') measurement of change, both of which are familiar in modern Western understanding (see Whitrow, 1972).

Two schools of thought dominated much of the scientific exploration of time in early modern philosophy, namely Newton's 'absolute time' and 'relational time' advocated by Kant and others. Newton asserted that time is part of the fundamental structure of the universe, and that it can best be looked on as a dimension in which events occur in sequence (leading, in later scientific study, and common vernacular, time to be described as 'the fourth dimension'). In Newton's theory, time is an entity in its own right and exists independently of any perceiver, progresses at a consistent pace throughout the universe, is imperceptible, and can only be understood mathematically. Relational time presents time as an abstract, which ceases to have any meaning or manifest unless there are objects with which it can interact or relate. In *Critique of Pure Reason* (1781), Immanuel Kant describes both space and time as 'a priori' notions which do not have structural form, but which are necessary perceptions for human comprehension of experience. Kant's chief assertion is that time while empirically real (that is, not illusionary) is "transcendentally ideal" (Kant, 1781/1999).

In his magnum opus *Being and Time* (1927), Martin Heidegger sets out on what he calls the 'destruction' of philosophical tradition, rejecting in its course both the linear Aristotelian model

of time, which he describes as ‘vulgar’ and the notion of a ‘divine infinity’ as set out by St. Augustine. Instead, Heidegger’s work is set firmly in the context of the existential analytic of *Dasein,* a fusion of the subject (being) and the object (world), intended to embody a ‘‘living being’’ through their activity of ‘’being there’ and “being in the world” (Horrigan-Kelly et al, 2006). Critchley (2009) notes that “the basic idea of *Being and Time* is extremely simple: being is time. That is, what it means for a human being to be is to exist temporally in the stretch between birth and death. Being is time and time is finite, it comes to an end with our death”, and asserts a directionality of time as implicit in *Dasein*, which he translates as ‘being-towards-death’ (Critchley, 2009). While this notion may sound morbid to the contemporary ear, Heidegger in effect removes any implicit morbidity with his assertion that "higher than actuality stands possibility" (Heidegger, 1927/2008) advocating in essence not for a passive awaiting of death, but for a positive acceptance of mortality in order to liberate possibility. Heidegger presents three *ecstaces* of time: the concept of *Gewesenheit* or ‘having-been-ness’ (Critchley, 2009) to describe the ‘emotional baggage’ of the past, *Augenblick* or ‘the glance of the eye’ (also used in Lutheran theology) to describe the present and, in typical style, makes a linguistic play between ‘the future’ (*zukunft*) and to come towards (*zukommen*). Being is not confined to the present, but always projects to the future.

Time is a well-established factor in mainstream economics and primarily used in relation to exploring sequential behaviours of capital investments over time, as in Böhm-Bawerk’s theory of ‘time preference’, dating from the late 1800s, Samuelson’s theory of ‘time-discounting’ in the 1930s, Koopman’s addition of ‘impatience’ in the 1960s, and more recently in behavioural economics, particularly in work relating to the role of human emotions and preferences in ‘time use’ (such as Kahneman and Krueger’s U-index, 2006). There are three main classifications of time used in economic analysis: logical, historical and intertemporal (Bausor & Shackle, 1982). Bausor and Shackle (1982) describe these classifications in terms of their application to points A and B. *Logical* time is time related to a causality between point A and point B, where both points are impacted by an event or events (or indeed by each other). *Historical* time, with which we are more familiar in everyday life, puts points A and B in order of chronological sequence. *Intertemporal* time refers to what something might look or behave like at point B compared to point A, primarily applied in economics to behaviours and choices in relation to investments, including of investment of time itself (Bausor and Schackle, 1982).

In his seminal work *A Brief History of Time* (1988), Stephen Hawking introduces the concept of ‘imaginary time’, a mathematical deceit of sorts which removes singular events like ‘The

Big Bang' from the past-present-future horizontal sequencing of 'real time' and instead introduces the prospect of a vertical time horizon hosting multiple and simultaneous events, which can happen at any point between the two axes - *imaginary time*. By removing the boundaries of 'real time', themselves occurring as singularities along a horizontal axis (a particular year, for example), Hawking also disrupts the equation of spacetime so that spatial boundaries are also removed, presenting the possibility of an infinite universe.

2.9 Care, Community and Citizenship: New Economic Models

In *Being and Time,* Heidegger uses three forms of expression rooted in the German word '*sorge*' or 'care'. *Sorge* represents concern for itself. It is reflective and, as such, concerned with the past. *Besorgen* represents action, the immediate provision of care, and relates to the present. *Fursorge* represents being concerned for others and relates to prevention or intervention (such as welfare). It relates to the future and 'leaps ahead of the other' to give *sorge* back to him/her (Dahlstrom, 2013). "Temporality", Heidegger writes "reveals itself to be the sense of authentic care" (Heidegger, 1927/2008).

In a present in which we are recovering from a global pandemic (and an associated widespread 'crisis of care') and with an increasing awareness of the impending threat of climate collapse, it is small wonder perhaps that both 'care' and 'temporality' feature large in current and emerging economic models and systems. Kate Raworth's *Doughnut Economics* (2017) presents the concept of the economic 'sweet spot' between the social floor and the planetary ceiling, an 'in between' space in which a compromise is made between our social needs for extraction and the limits of planetary resources. Hillary Cottam's 2019 book *Radical Help* proposes a new model of social welfare provision (envisaged as a 'fit for purpose' successor to the welfare state) which is based on human relationships, social connections and collective capacity, foregrounding care as "the compost within which everything else takes root' (Cottam, 2019). In *The Good Ancestor* (2020), Roman Krznaric calls for a 'deep time humility' and prioritising our future descendants over the 'pathological short-termism' of our current political cycles, short-term consumerist mores and growth-fixated economic model. "Promoting greater intergenerational justice", Krznaric writes, "guided by the transcendent goal of creating a world in which the needs of future generations can be met with the resources on our finite planet – 'one-planet thriving' – should be a major goal of anyone aspiring to become a good ancestor. If people just don't care, we're doomed." (Krznaric, 2020).

Arguably reinforced by the wealth of community spirit and connection that has emerged during the pandemic and its necessary adaptations and 'lockdowns', many emerging models are founded on community building and collective action (as opposed to competition). 'Community Wealth Building', a term first used by The Democracy Collaborative in the US in relation to its work with people and communities in Cleveland, is the latest economic model (following 'inclusive growth') to gain prominence in the UK. The Centre for Local Economic Strategies (CLES) has facilitated much of the work in the UK. In '*Owning the Future. After Covid-19: A New Era of Community Wealth Building'* (Guinan et al, 2020), CLES identify five pillars of the Community Wealth Building approach: financial flows, land and property use, local spending and progressive workforce practices, all re-directed toward the fifth pillar, 'building the generative economy', characterised as "locking wealth into place" (Guinan et al, 2020). Mariana Mazzucato's work around the *Mission Economy* (2021) relates to the 'moonshot' principles of collaboration and risk-taking exhibited in the US moon landings of 1969. Mazzucato calls for a similar approach to what she calls *'capitalism's triple crisis*' (health crisis, economic crisis and climate crisis), in a collective mission of significant risk and scale which will necessarily incorporate '*interactions between both public and private actors, as well as actors from the third sector and from civil society'* and in which both risks and rewards are shared (Mazzucato, 2021). Elinor Ostrom's work around polycentricity (2010) sets out her thinking on those aspects of economy that "do not fit into a dichotomous world of 'the market' and 'the state" (Ostrom, 2010). Famously advocating for locality, diversity and autonomy in communities and for community self-governance of shared assets or resources as 'the commons', Ostrom's work is once again finding resonance in contemporary economic theory and practice (Former International Monetary Fund Chief Ragurham Rajan also argues for the importance of community in his 2019 work *The Third Pillar*, as the 'third pillar' of the title).

The New Citizenship Project (NCP) notes a 'post-COVID' emergence not only of community and collectivism, but of collective community activism as a current expression of what it calls 'The Citizen Shift' (NCP, 2015), a three-stage movement in self-identification, both individually and as the collective conscious, from *subjects* to *consumers* to *citizens*. The power of people as citizens and self-organised agents of change has been demonstrated in the 'on the ground' response to the COVID-19 pandemic and in particular, as NCP Director Jon Alexander notes in a November 2020 blog, in "the myriad of 'Mutual Aid groups and hyperlocal self-organising units' that have emerged in spite of the 'social distancing' restrictions imposed by

lockdowns" (Alexander, 2020). This burst of citizenship is observable too in the rise of new civic movements across the world. The Black Lives Matter movement, the #metoo movement, democratic protests in Hong Kong and school strikes in protest of climate change have all come forward to show solidarity and to demand and secure justice, action and change. title).

The shift toward a new assertion of agency in emerging citizenship models runs alongside growing frustration and critique with the 'Quadruple Helix' innovation framework (as cited by Rissola et al, 2017 – see Section 2.5). Miller et al (2016) state explicitly that neither the triple and quadruple helix studies have delivered the expected results, with both Ivanova, 2014 and Nordberg, 2015 identifying a tendency to define the fourth helix as civil society or end-users (or both). Hasche et al (2019) assert that "the fourth helix is far more complex than limiting it to simply become a fourth separate helix of users or civil society" and call for a "hybrid" model which emphasises the value generation of "the relational processes taking place within a quadruple helix setting" (Hasche et al, 2019).

2.10 Summary & Conclusions

There is clear resonance between the post-structuralist, humanistic approach of exploring the spaces which sit between established binaries and the space which sits at the heart of the place/innovation nexus, which is the focal point for the research. Particular resonance can be found with Bhabha's 'Third Space Theory' (Bhabha, 1994) and Soja's 'Thirdspace' concept which show a deep theoretical and conceptual fit with the research, especially in terms of Bhabha's integration of culture heritage within the 'Third Space' paradigm. Tuan's work (*Space and Place*, 1977) explicitly introduces the concepts of space and place as binary parameters and it is on this basis that the research seeks to contribute to the still-developing conceptual definition of 'place', both in terms of its relation to space and, to use Lefebvre's phrase, in terms of its own 'singular logic' (Lefebvre & Regulier, 1994/2004).

Staying with Lefebvre, his *Rhythmanalysis* (1994) is widely regarded as a defining text in the exploration of sensory spatial dynamics (positioned again, where post-structuralism meets humanistic), and sets the tone for the approach employed in the research for exploring the 'dynamic processes' (Oksanen and Hautamäki, 2014) of innovation ecosystems. Incorporating sensory dynamics (such as visual responses to light and aural responses to sound) proposes too, the concept of 'embodiment', a term popularised by humanistic geographers such as Thrift (2003) to describe the multi-faceted and multi-sensory relationship between the human body

and the experience of place (Holloway & Hubbard, 2001). This in turn presents considerations for the concept of 'embeddedness', a common denominator in both place and innovation theory and policy and co-related too to the concepts of 'culture', 'heritage' and 'cultural heritage'. Although both Polanyi (1947), to whom the first use is attributed, and Granovetter (1985), use the term to describe dynamic networks (Polanyi of bartering, redistribution and reciprocity and Granovetter "concrete, ongoing systems of social relations"), there is arguably a sense of 'institutional capture' – and room for authoritarianism - in the structural reference points described in Polanyi's substantivist paradigm (such as the church, state, markets, religious and moral codes), which arguably does not fit with the fast-moving, real-time dynamics of 'living' innovation ecosystems. The research seeks to explore the nature of the 'dynamic processes' (ibid) of both place and innovation, and to ascertain the extent to which innovation, its production and use, place and 'placemaking' have been subject to 'institutional capture'.

This opposition between 'fixed' and 'liberated' is explored too in the work of Harvey (2006), who describes fixed capital as a paradox which through its dependence on "the labour of future use" results in a situation in which "the very form of flow designed to liberate capital therefore ends up directing the flow back into that space". This sense of othering (present in Derrida, Foucault, Freud, Hegel, Husserl and Lacan) along with Derrida's critique of 'centring' as creating "peripheries and margins" (Derrida, 1972) and, by extension creating the margin*alised*, can arguably be applied to spatial approaches to innovation, and in particular the designation of bordered areas as 'innovation districts' (and the implications for areas outside of those borders).

Thrift (2003) describes how:

"For a long time in geography, the accepted way was to mimic a standard means by which the world is organized and draw boundaries around areas which were assumed to contain most of a particular kind of action and between which there was inter-action. Once geographers had drawn lines round and labelled these large blocks, they held them responsible for producing characteristic forces or powers. So, for example, we might say that this block of interaction was a capitalist space or an imperialist space, a neoliberal space or a dependent space, a city space or a community space, and that it had particular inherent qualities. Such a strategy of regionalization is obviously useful. It captures and holds still a particular aspect of the world and it is doubtful that we could ever do without it. But it is always an approximation and it has some serious disadvantages, most notably the tendency to assume that boundary equals cause,

and the tendency to freeze what is often a highly dynamic situation. So, geographers began to become more and more impatient with these kinds of representations, not so much because they were wrong but because they seemed to leave so much out of contention." (Thrift, 2003)

Here, Thrift captures a particular paradox – and, arguably, an inherent problem – with the assignation of 'innovation districts', namely the inference that 'innovation' exists only within the bounded area, and arguably produces the 'peripherals and margins' noted by Derrida (1972), described by many in the policy world (including in Rissola, 2017) as "unintended negative consequences". The research will further interrogate this phenomenon – and the paradox between liberation and containment - as part of its exploration of the place/innovation nexus (including through case-study analysis).

There is a sense in much of the literature, and particularly in the post-structuralist theory, of a desire for transcendence, the ability to elevate above and beyond the confines of established structures, dichotomies and hierarchies. With a well-established basis for thirding, othering and the 'thirdspace' (Soja, 1996; also present in Foucault, Baudrillard, Bhabha and Lefebvre), the research seeks, in effect, to transcend the boundaries of the 'thirdspace' by exploring the potential for, nature and manifest of a 'fourth space'. Related to an emerging advocacy for democratising spaces (physical and virtual), enhanced citizenship, inclusion, plurality, poly-vocalism and community ownership (observable in, among others, Ostrom, 2010, CLES' 'Community Wealth Building' and NCP's 'The Citizen Shift') and contemporary proposals around new economic models (including Raworth's *Doughnut Economics*, 2017 and Mazzucato's *Mission Economy*, 2021), the exploration of a 'fourth space' in the research is rooted in its adoption of a cultural heritage lens, bringing with it co-related concepts of connection, identity and – critically – *time*.

Incorporating 'time', widely regarded as the fourth dimension, as a key concept within the research, and as a principal tenet in a 'fourth space', asserts consideration of the past-present-future triad, and of related issues such as sustainability and survival. Time, described by Kant as "transcendentally ideal" (Kant, 1781) is explored in the emerging 'fourth space' as having transcendental potential beyond historical, chronological and intertemporal time (Bausor and Schackle, 1982) and, through application of the cultural heritage lens, with the potential to embody both the holistic attributes of culture as described by Williams "a whole way of life" (Williams, 1958) and Heidegger's *Dasein* (1927) - 'being-towards-death' (Critchley, 2009) – through which, in effect, it transcends itself.

The research explores the potential for the ‘fourth space’ as a catalyst for elevating established tri-partite models and frameworks (such as Katz & Wagner’s three types of innovation district typology, 2014) and liberating ‘fixed’ and, in some cases, paradoxical spatial and temporal dynamics beyond established structures, boundaries and borders. The ‘fourth space’ is both a distinct and holistic ‘rhythm’ (Lefebvre, 1994), an all-encompassing ‘4’ to the 1,2,3, the challenge of a ‘D’ to the A,B,C, the D’Artagnan in *The Three Musketeers* and ‘The Big, Bad Wolf’ in *The Three Little Pigs*.

Without those catalytic antagonists, would those stories even exist?

3. Research and Design Methodology

3.1 Introduction

Remenyi et al (2003) describe a methodology as the "overall approach to a problem is put into practice in a research process, from the theoretical underpinning to the collection and analysis of data". This chapter presents the methodology employed in this research, which has been supported in articulation and practice by two models: the nested research model (Kagioglou et al, 1998) and the design science method, as put forward by Johannesson and Perjons (2014). Adoption of this dual approach, employing each model as both discrete and interconnected with the other, has been driven by the aims and objectives of the research which aim not only to explore problems, gaps and challenges, but to propose solutions (specifically a workable tool prototype for evaluation and measurement of innovation strategies and economies). Application of new and emerging methods in design science and systems thinking, grounded in 'traditional' research methods and strategies has allowed the research to employ both rigour and creativity and to stay focussed on its core aims and objectives while maintaining relevance in fast-changing and dynamic contexts. This chapter details the philosophies, approaches and strategies behind and within each of the methods and sets out how they have been integrated and applied in this research.

3.2 Research Methodology

The research process incorporates methods and procedures selected in accordance with the nature, aims and objective of the research (Welman, Kruger & Mitchell, 2005). Preparation of a research methodology prior to conducting research is widely identified as a critical factor for success (Collins & Hussey, 2003). Sridhar (2008) describes a research methodology as a systematic and orderly approach to the collection and analysis of data while Blessing and Chakrabati (2009) define a methodology as an approach and set of supporting methods and guidelines which "should help to identify research areas and projects and assist in selecting suitable research methods to address the issues" (Blessing & Chakrabati, 2009).

The nested model remains a popular approach for framing research methodologies. Introduced in 1998 by Kagioglou et al, the model is represented figuratively as an integrated shape of three layers (Figure 3.1) Its focus is the logical relationship and flow between the research philosophy, research approach and research techniques.

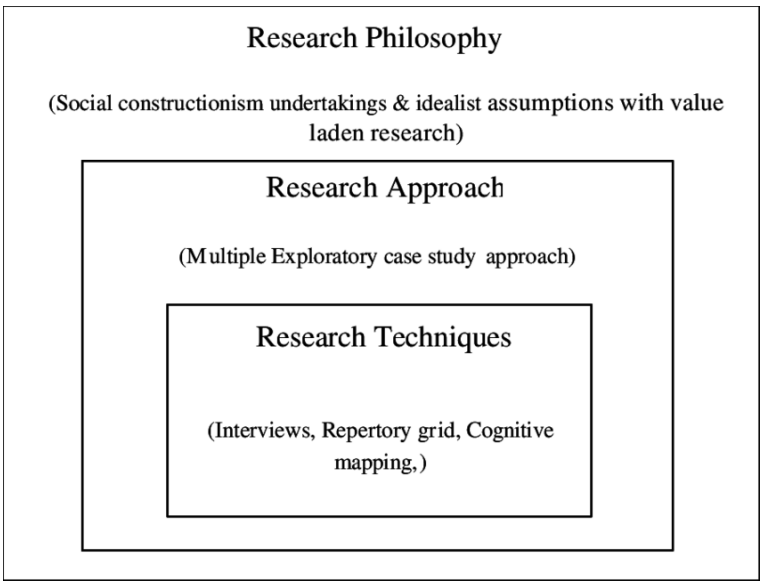

Figure 3.1: The nested research model (Source: Kagioglou et al, 1998)

The nested model was selected to support the research, offering as it does a tested and proven system of logic and decision-making was selected to assist in this research and specifically in delineating a clear and concise route of travel from research philosophy to the selection of research techniques. Each of the sub-sections which follows relates to a layer of the nested model and describes its application in this research.

3.2.1 Research Philosophy

Research philosophy is primarily concerned with 'the way in which a researcher views the world' and relates to sets of beliefs and assumptions about the development of knowledge (Saunders et al, 2016). Sahay (2008) observes that students often 'question the relevance of selecting a philosophy', though innumerate studies exist which point to the criticality of taking heed of the philosophical standpoint, and ideally at the outset of the research. Creswell (2009) describes early consideration of different philosophical perspectives and assumptions as 'vital', while Adams (2013) states that understanding the research philosophy is key to creating a strong and supportive foundation for the research.

Determining a philosophical position is a reflexive process underpinned by the combined outcome of a series of assumptions made within and across three governing philosophical

paradigms: ontology, epistemology and axiology. Ontology relates to "the nature of reality…and assumptions researchers have about the way the world operates" (Saunders et al, 2016). Epistemology is "concerned with the study of knowledge and what we accept as being valid knowledge" (Collis and Hussey, 2009). Axiology relates to "assumptions about the nature of values the researcher places on the study" (Creswell, 2011). Philosophical standpoints or "world views" can be attributed as objective or subjective within the ontological paradigm, as positivist or interpretivist in the epistemology and value-laden or value-free in terms of axiology (Easterby & Smith, 2002, Collins & Hussey, 2009; Saunders et al, 2016).

The research explores the phenomenon of innovation and the context of place through the expressed thoughts, feelings, emotions and interpretations of selected experts living and working in the selected place. As such, the research is ontologically **subjective**, adopts an **interpretivist** stance (in terms of epistemology) and is heavily **value laden** (in terms of axiology). Primarily focussed on the inter-relationships and inter-play of humans and human networks in innovation and creation and diffusion of knowledge, the research takes a strong **social constructivist** stance. There is alignment with the **post-modernist** philosophy evident in the exploration of language and power relations. Finally, there is evidence also of **pragmatism,** particularly in the application of mixed methods. In sum, the research is presented as value-laden **social constructivism**, driven by the economic geography of innovation.

3.2.2 Research Strategy

The second layer of the nested model represents decisions around research strategy, defined by Denzin and Lincoln (2001) as "a plan of how the researcher will achieve the research aim by answering the established research objectives". The strategy should incorporate elements that are capable of answering the research questions and meeting the objectives of the study while at the same time taking the philosophical stance into account and considering any challenges around the availability of time, existing knowledge and other key resources (Saunders et al, 2016). The research strategy adds a focus and directionality to the research approach, as noted by Rem**e**nyi et al (2003) and described by Bryman (2008) as an "orientation".

Yin **(**2014) puts forward five elements of strategy as appropriate for social science research: experiment, survey, archival analysis, history and case study, and three primary considerations for selection: 1. Type of research questions posed, 2. The extent of control the researcher has

over actual behavioural events, and 3. The degree of focus on contemporary issues. Fellows & Liu (2007) suggest five methods are particularly suitable for studies in the built and spatial environment: action research, ethnographic research, surveys, case studies and experiments. Experiments, described by Yin (2014) as being "carried out in controlled environments where the context and phenomena are separated" and by Collis and Hussey (2009) as "manipulation of independent variables to observe behaviour of dependent variables" were adjudged not suitable for this research, particularly given Yin's further assertion that experiments require the researcher to have control of behavioural events (Yin, 2014), which is not the case here. This research is very much focussed on contemporary (and even future) issues and as such approaches based on history and archival analysis were adjudged to be less relevant, if at all. Ethnographic approaches present significant challenges in regard to time resource, requiring the researcher to be "immersed in the group under study in order to understand the phenomenon being studied" (Easterby, Smith et al., 2008), and were also adjudged to be limited in terms of scope for comparative analysis (of the way in which innovation is manifest in alternative place settings).

Given the contemporary, dynamic and fast-changing nature of both innovation and the context of place, action research, described by Reason and Bradbury (2007) as a "continuing action of planning, diagnosing, taking action and evaluating" was identified as a useful strategy for the research. Yin (2014) proposes that each method relates most appropriately to one or more forms of research question (from the given forms of 'how', 'who', 'what', 'where', 'how many', 'how much' and 'why'). As the research questions are framed as 'what' and 'how' queries and the aims and objectives are primarily concerned also with the 'what' and the 'how', seeking to define key concepts such as innovation, place, cultural heritage and embeddedness as the 'what' and exploring how they interact as the 'how', case study was identified as an appropriate strategy for this research. There is an implicit call in the questions regarding the extent to which key concepts are inter-related, giving rise to a subsidiary question of 'how much', associated most closely by Yin (2014) to the survey research strategy. Although survey is utilised in the research, it is done so as a technique in support of the case study strategy (along with questionnaire and semi-structured interview), and as such is explored further in the section on research techniques (Section 3.2.6).

Taking all of these considerations into account, two core elements of strategy were selected for the research: **case study** and **action research.** Further description of these strategies and their application to the research is given in the following sub-sections.

3.2.3.1 Case Study

Collis and Hussey (2009) define case study as a phenomenological research strategy, "a methodology that is used to explore a single phenomenon in a natural setting using a variety of methods to obtain in-depth knowledge". Case studies can generate a "deeper understanding" (Morris & Wood, 1991) and can accommodate both qualitative and quantitative data (Yin, 2003) to produce deep and rich data sets (Gerring, 2007). Yin (2003) defines case study as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context". Yin's definition is particularly fitting for the role of case study in this research, exploring as it does the contemporary phenomenon of innovation within the real-life context of place.

There are several identified categories of case-study. Yin (2003) notes three categories: exploratory, descriptive and explanatory. Exploratory case-studies, including pilot case studies (McDonough & McDonough, 1997), explore any phenomenon occurring in the data that is of interest to the researcher. Descriptive case studies, which may be in narrative form (McDonough & McDonough, 1997) describe the phenomenon which occur within the data, while explanatory case studies examine the data at both a surface and deep level in order to explain phenomena occurring in the data. McDonough and McDonough (1997) include additional categories including interpretative, through which data is interpreted to develop, support or challenge conceptual categories, and evaluative, which extends interpretation to include the researcher's judgement.

Case studies can be considered theory building or theory affirming. Eisenhardt (2007) states that building theory from case studies involves using one or more cases to "create theoretical constructs, propositions, and/or midrange theory from case based, empirical evidence" Exploratory case-study can be more appropriate for the early stages of research and particularly for building a theory or developing a hypothesis because of its nature as open-ended enquiry (Amaratunga et al, 2002). Yin (1994) supports multiple case studies as a better basis for theory building because it allows for comparison between the cases, which in turn can lead to a stronger theory.

This research adopts a multiple case-study approach, undertaking case studies in Greater Manchester, Greater Boston (Boston/Cambridge) and King County (Seattle). These are exploratory case studies, the results of which are compared in the research analysis. A later, single case-study (the Liverpool City-Region) is undertaken in the final stages of the research which acts primarily as a representative (Yin, 2014) and evaluative (McDonough &

McDonough, 1997) case study, in that it is used both as evidence to support concepts emerging from the wider research and includes elements of evaluative appraisal and researcher judgement (McDonough & McDonough, 1997).

In each case, the case study boundary, described by Yin (2014) as "the limitations of data collection" and which Gerring (2007) asserts should be "a spatially bounded phenomenon" is the **city-region** (of Greater Manchester, Greater Cambridge, King County and the Liverpool City-Region). The unit of analysis which, according to Gerring and McDermott (2007) must be at the same level as the object of the proposition, is the **innovation district** (operating within those city-regions). An innovation district is described by Katz and Wagner (2014) as "a geographic area where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators, and accelerators" (Katz & Wagner, 2014). As all of the case studies shares this single unit of analysis, the research adopts a **multiple-case study, holistic** design (based on Yin's holistic/embedded classification matrix, 2014), which is complemented by **action research**.

3.2.3.2 Action Research

O'Leary (2007) describes action research as "research strategies that tackle real-world problems in participatory, collaborative, and cyclical ways in order to produce both knowledge and action". Meyer (2000) describes action research as "a process that involves people and social situations that have the ultimate aim of changing an existing situation for the better". Bryman and Bell (2011) note the proactive role of the researcher in action research, describing it as "an approach in which the action researcher and a client collaborate in the diagnosis of the problem and in the development of a solution based on the diagnosis". The primary purpose of action research, according to Reason and Bradbury (2001) is "to produce practical knowledge that is useful to people in the everyday conduct of their lives. In their seminal text on action research, Carr and Kemmis (1986) assert three underlying principles for action research: 1. participatory character; 2. democratic impulse and 3. simultaneous contribution to social science (knowledge) and social change (practice).

There are a number of established action research models, some of which are proposed with specific application to distinct sectors and settings (Parkin, 2009). Action research is a popular method of research in healthcare environments (Whitehead et al., 2003; Lingard et al., 2008) and, given its dialectic nature, in educational and teaching research settings (Fullan, 2000; Mills,

2003). Kemmis and McTaggert (1988) list four key components of action research: 1. Developing a plan for improvement, 2. Implementing the plan, 3. Observing and documenting the effects of the plan and 4. Reflecting on the effects of the plan as the basis for further planning and informed action. (Kemmis & McTaggert, 1988). Both Mills (2003) and O'Leary (2007) build and elaborate on the four core elements on the Kemmis and McTaggert model.

Stringer's model of action research (Figure 3.2) first put forward in 1999 and further elaborated in 2003, 2007 and 2009 (alongside the emerging PAR narrative) is presented as context-specific to "community-based action research" (Stringer 2009) and is based on a cyclical model of three steps: 'Look – Think – Act'**.** Stringer (2009) describes the flow of the model as iterative, "enabling people to commence their inquiries in a straightforward manner and to build greater detail into procedures as the complexity of issues increases".

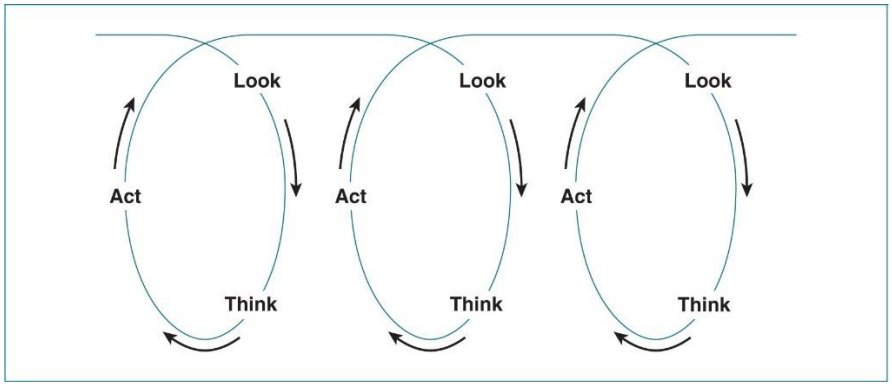

Figure 3.2: 'Look-Think-Act' Action Research Model (Source: Stringer, 2009)

While Koshy et al (2010) remind us that existing models should not be applied as a "straitjacket" which "could adversely affect the unique opportunity offered by the emerging nature and flexibility that are the hallmarks of action research", Stringer's model arguably offers the most resonance with the iterative nature of the research and with the cyclical, dynamic nature of the innovation process (as the subject of the research).

Stringer (2009) describes an action research project as "seeking to create *knowledge*, propose and implement change and to improve *practice* and *performance*". Given the aims and objectives of this research relate to identify and addressing gaps in *knowledge*, specifically around place and innovation, in *practice*, in terms of application of place and innovation knowledge as urban development strategies and *performance*, in terms of the success of those

strategies in addressing current and emerging social challenges, and further that it seeks to make recommendations as to opportunities for improvement and change, action research was adjudged as an effective and appropriate strategy in this case.

Action research is most often classed as phenomenological study (Collis & Hussey, 2009; Coghlan & Brydon-Miller, 2004) undertaken from an interpretivist stance where "meaningful construction occurs through interpretations of researchers' experiences and communication" (Blaikie, 1993) and dealing with highly subjective data "where the experience and insights are of a unique and personal nature" (Burrell and Morgan, 1979). Further, its participatory nature fits with a constructivist paradigm, described by Denzin et al (1998) as "an understanding of the complex world of lived experience from the point of view of those who have lived it". As such, it demonstrates a good fit with the philosophical stance of the research. For this research, the 'Look, Think, Act' (Stringer, 2009) **action research** strategy was employed in the co-design and delivery of the **'M4'** project (see Section 4.6).

3.2.3 Research Techniques

The final layer of the nested model relates to research techniques and is concerned with data collection and the analysis of collected data (Saunders et al, 2016). Yin (2014) identifies six primary sources of evidence for consideration in data collection: documentation, archival records, interviews, direct observation, participant observation and physical artefacts. Each of these sources has inherent strengths, principally in terms of precision or insight, and weaknesses, principally around issues of bias, access and resource limitations. Adoption of multiple evidence sources can ameliorate weaknesses in single techniques (Stake, 1995). Yin (2003) notes a particular benefit of the case study strategy is that it is able to accommodate a number of evidence-gathering techniques.

Adoption of a mixed method approach to analysis can further ameliorate weaknesses (B**ry**man, 2012). Quantitative and qualitative approaches to data collection and analysis are employed in the research, combining qualitative analysis of semi-structured interviews with quantitative analysis in the comparison of coding data and Delphi technique results. NVivo software was used to assist with data coding and analysis. Finally, collection of data from both primary and secondary sources (Saunders et al, 2016) can also assist in addressing gaps and weaknesses (Bryman, 2012). Primary data in this research was collected through **questionnaire, survey direct observation, semi-ethnographic study, photographic survey** and **semi-structured**

interviews, while secondary data was collected through literature review, online research and through collaborative studies led by other researchers in the MAPS-LED team.

3.2.3.1 Questionnaire Design

Saunders et al (2016) describe the questionnaire as "a set of pro-forma questions distributed to individuals with the aim of gathering information". The questionnaire for use in this research (see Appendix i) was designed primarily to support semi-structured interview and is divided into four discrete but inter-related sections. The first section focusses on the concept of the 'innovation district' and how that is spatially, socially and culturally manifest. The second section seeks to further explore infrastructural aspects and the third section explores connectivity and linkages. The fourth section is a single question designed specifically to identify perceived gaps and challenges.

The questionnaire was designed with maximum utility and flexibility in mind. It includes five options within each question, for use as 'prompts' where appropriate and necessary in the semi-structured interviews. These prompts were later used as the basis for both the surveys (undertaken at Impact Hub Seattle and Federation House, Manchester) and in the application of the Delphi technique (related to the 'M4' action research project).

3.2.3.2 Likert Scale

Six of the questions in the questionnaire are composed using the Likert Scale, a gradated scale presented in 1932 by its creator Rensis Likert as 'A technique for measuring attitudes' (Likert, 1932). A Likert Scale is a set of consecutive integers arranged as bivalent and symmetrical around a neutral middle (Uebersax, 2006) which measures the level of agreement or disagreement with a target statement.

The popularity of the Likert technique has given rise to interpretation of and departure from the core features and characteristics of the scale as set out by Likert in 1932 (and as condensed and restated by Uebersax, 2006) resulting in some techniques being labelled as 'Likert-like' scales (which might, for example, feature an equal number of questions without a 'neutral middle') and in debate both around the nature of the scale, primarily whether it should be regarded and analysed as ordinal or interval, and the validity of the scale in terms of being able to establish if there is an equal grading between the integers (Guerra et al, 2016; Blaikie, 2003),

although as Blaikie observes, “researchers frequently assume that they are”. Each application of the Likert Scale in this research features five integers and a neutral middle and relates to a ‘Likert item’ or single statement.

There is some argument too about the validity of parametric statistical analysis if equal distribution is not established for integer grading. This research applies parametric analysis of the mean value, building on Norman’s argument (2010) that equal distribution is not necessary for parametric analysis when the sample size is greater than five (as statistical probability will correct any abnormalities or exponentials). Sample sizes in this research for instances in which the questionnaire is used as a strategy and, by extension, in which the Likert Scale is used as a technique, range from ten (in the two phases of expert interview and in each of the Delphi rounds) to forty-five (in the Greater Manchester case study).

3.2.3.3 Interview Design

McNamara (1999) defines interview as “a verbal conversation between two parties with the objective of generating information”. McNamara further observes that interviews are a particularly valuable technique in accessing in-depth information based on a participant’s personal story and experience (McNamara, 1999). Yin (2007) notes that interviews are the most common source of evidence in case studies. Amaratunga et al (2002) suggest that interviews are the most appropriate technique for built environment research.

Saunders et al (2016) identify three approaches to conducting interviews: structured, unstructured and semi-structured. Halperin and Heath (2012) describe semi-structured interview as the collection of “detailed, often specialised information from a single individual”. Unlike surveys or structured interviews, which collect standardised data from a broad range of people, semi-structured interviews work as a flowing conversation based on a set of subjects. This research employs semi-structured interviews as a key research technique, utilising the questionnaire (see Appendix i) as a point of structure, but allowing the participant to express views and opinions in an unrestricted way. Utilising the questionnaire as a core structure has facilitated cross-comparison with other data sources, while adopting a semi-structured format with an open and flexible approach to participant response has generated rich data. A total of one-hundred and thirty semi-structured interviews were conducted in the course of the research.

3.2.3.4 Delphi Technique

The Delphi method, described by Dalkey and Helmer (1963) as a procedure designed to "obtain the most reliable consensus of opinion from a group of experts" through employing "a series of intensive questionnaires interspersed with controlled opinion feedback", was originally developed and employed in the 1950s by the United States Air Force (Gracht, 2012). The technique is widely acknowledged as mitigating contextual bias arising, for example, from current social, personal and political conflicts (Rowe & Wright, 1999) and in the years since its development has been used as a forecasting tool across a variety of sectors in order to generate an aggregated opinion (Dunham, 1988).

The key features of the Delphi technique are anonymity, iteration, controlled feedback and statistical aggregation (Chapman, 1998). A statistical summary of feedback is undertaken in between each round of questionnaire and aggregated at the end of the exercise to establish consensus **(**Dunn, 1994). Chapman (1998) highlights participant anonymity as a critical feature of the technique, particularly in generating unbiased information. Anonymity reduces the effect of dominant individuals (Fischer, 1978) and anonymous participants are more willing to change previously expressed opinions, without fear of judgement (Strauss & Ziegler, 1975).

Selection of panel members, according to Taylor and Judd (1989), is "without question the most important step in the Delphi method". For this research, the Delphi technique was applied in relation to the 'M4' action research project and as such the panel was selected from participants taking part in that project. Ten panellists were engaged, reflecting the minimum number proposed by Chen et al (2003) and Armstrong (1985) who proposes an optimum panel membership of between five and twenty.

The minimum number of questionnaire-rounds required by the Delphi method is two. Rowe and Wright (1999) suggest that between two and fifteen rounds is optimal, observing a cumulative participant "fatigue" in examples of the technique featuring over fifteen rounds. Given the short amount of time available for this research (and for the action research project to which it is applied), the minimum number of two rounds was chosen as most appropriate. Each round consists of two staged interviews, to establish a mean aggregate response, with – as per the established standards for the technique – feedback between the two rounds. For this research, questionnaires for the first round were completed on 1st and 15th May 2017, with a feedback session hosted on 8th May 2017. Questionnaires for the second round were completed on 7th and 21st May 2018, with a feedback session hosted on 14th May 2018. A total of forty

semi-structured interviews was undertaken as part of the Delphi exercise (two rounds of Delphi, featuring two interviews per panellist in each round, interviewing the same ten panellists per round).

3.2.3.5 Sampling Method

Research requires a sample of the population to be selected that is both manageable in terms of the research resources and which can be held as representative (Saunders et al, 2016). Saunders et al (2016) posit probability and non-probability sampling as the two overarching strategies in sampling selection, assigning four sub-sets within each strategy: simple, systematic, stratified and cluster in probability sampling and quota, purposive, volunteer and haphazard in non-probability sampling. As participants in this research were all selected on the basis of either their place of work or their professional expertise or both, the research employs purposive sampling, a sub-set of non-probability sampling (described by Kumar, 2011 as "a specific sample selected in a non-random way in order to obtain rich and specialised data").

Saunders et al (2016) propose a minimum sample size of between five and twenty-five for semi-structured interviews and between twelve and thirty for sampling a heterogenous population. For the purposes of this research, each case study features at least fifteen semi-structured interviews: fifteen each in Greater Boston (Boston/Cambridge), King County (Seattle) and the Liverpool City Region and forty-five in Greater Manchester (totalling ninety interviews across four case studies). Ten further semi-structured interviews were undertaken over two rounds, the first round with experts identified as leading innovative, culturally focussed and/or citizen-led development programmes and the second with experts working locally, regionally and nationally in place, innovation, systems design and alternative economic modelling. Ten further panellists were selected to take part in two (anonymised) questionnaire rounds in application of the Delphi method, linked here to the 'M4' action research project. Surveys were completed by fifty respondents from the membership of Impact Hub Seattle and fifty-seven respondents from the membership of The Federation, Manchester.

3.2.3.6 Survey

Surveys, described by Jackson (2011) as "questioning individuals on a topic or topics and then describing their responses" and by Check and Schutt (2012) as "the collection of information from a sample of individuals through their responses to questions", are well-established as an

efficient strategy for the collection of data in the social sciences (Smith, 1975; de Leeuw, 2005) and noted for their utility in allowing for a higher level of control in the sample of participants (Shuman & Presser, 1996). While surveys are generally regarded as demonstrating best fit with a positivist stance and, by extension, with quantitative approaches (Hughes & Sharrock, 1997), in practice, the survey format allows for both quantitative and qualitative analysis (Ponto, 2015), fitting well with the mixed methods approach of this research.

Surveys used in this research were hosted on the UK-based online platform 'Survey Monkey' (surveymonkey.co.uk). The use of online surveys comes with a number of additional considerations, including respondents' "motivation, computer literacy, abilities, privacy concerns and many other factors which influence completion" (Vehovar & Manfreda, 2008). While their ease of creation and distribution has made research more accessible, according to Vehovar and Manfreda (2008), this has also driven an increased popularity and mass use, resulting in online survey creation by people with limited methodological experience and "significantly reducing the legitimacy of their use" (Vehovar & Manfreda, 2008). Manfreda et al (2008) find that online surveys suffer from lower recruitment rates than other formats, with a reduction of up to 11%.

For this research, surveys were delivered through questionnaire and used to gather the opinions of members from communities of two co-working spaces located within recognised 'innovation districts' in case study city-regions. (Impact Hub, Seattle and The Federation, Greater Manchester), acting as purposive samples of their respective heterogenous (Saunders **e**tc al, 2016) workplace communities. With consideration to computer literacy and access issues, the nature of the co-working spaces and their focus on enabling technologies would presume a level of computational ability and access. Participants for the survey were recruited with the aid the staff teams at the co-working spaces, with the stated aim of recruiting fifty respondents per survey. Exactly fifty respondents were recruited at Impact Hub, Seattle and fifty-seven at The Federation, Greater Manchester.

3.2.3.7 Data Collection and Analysis

Data analysis consists of "examining, testing, tabulating, categorising and recombining qualitative and quantitative evidence to address the initial propositions of a study" (Yin, 2014).

For this research, data generated through semi-structured interview was collected through audio-recording and written notes. Audio recordings were transcribed, and notes recorded

within twenty-four hours of each interview. Analysis was supported by NVivo software, used to analyse qualitative data collected from semi-structured interviews, and the Survey Monkey (surveymonkey.co.uk) online platform (plus export to Microsoft Excel), used to analyse quantitative data collected from surveys. Both systems use calculation and comparison of mean and weighted percentage values.

Qualitative data generated in the research has been analysed using **content analysis**. Described by Berelson (1952) as "a research technique for the objective, systematic and quantitative description of the manifest content of communication", content analysis offers quantitative analysis of qualitative data alongside, as described by Franzosi 2004, the opportunity for "inference, objectivity and systematisation". Kulatunga et al (2007) identify word count, conceptual, relational and referential analysis as the four main sub-sets of the content analysis method. The **word count technique** analyses frequency of words in texts, applying assumptions about the relative importance of those words (Jackson & Trochim, 2002). Conceptual content analysis identifies principle or dominant concepts and themes (Krippendorf, 2013) through categorisation in codes (Franzosi, 2004). Relational analysis identifies relationships between concepts while referential analysis considers underlying meanings through interpretation and researcher judgement (Kulatanga et al, 2007).

Supported by NVivo software, the word count technique was applied in this research both deductively, proposing a set of fifteen words relating to the research questions (the selection of which was validated independently through scoping interview) as search terms (Figure 3.3) within eight 'nodes' (themes) of enquiry, and applying assumptions around the relative importance of those words based on the frequency of their occurrence, and inductively, removing the fifteen words from the word count (as a 'Stop Words' list) and repeating the word frequency count to reveal the most frequently used words beyond the set terms.

NODE	SEARCH TERM
Reference to innovation – product and process	Innovation
Reference to place and sense of place	Place (based) (grounded)
Reference to embeddedness, sustainability	Embedded Sustainable
Reference to culture, history, heritage or arts	Culture
	Heritage
	History
	Art
Reference to spatial factors	Space
	Environment
	District
Reference to economic factors	Economy
	University
	Transport
Reference to social factors	Social
	Network
	Collaborate
	Community
Reference to gaps and challenges	Housing
	Diversity

Figure 3.3: Nodes and Search Terms used for word frequency analysis (with NVivo)

The same technique was repeated throughout the research for all data collected through semi-structured interview, with the additional step at each stage of precluding the five most frequent words used in the prior stage (from outside of the search terms) by adding those words to the 'Stop Words' list in the subsequent stage. Repeated application of this inductive technique in this way has allowed for iterative identification of new words emerging strongly at each stage of the research and for assumptions to be made regarding their frequency of use in relational comparison to other stages.

3.2.4 Summary and Nested Model

Figure 3.4: Nested research model - Author's elaboration, based on Kagioglou et al, 1998

Figure 3.4 summaries the research approach using Kagioglou's nested model (Kagioglou et al, 1998). The philosophical stance of the research is value-laden social constructivism, exploring spatiotemporal phenomena through constructs related to the economic geography of innovation. Incorporating multiple case-studies for exploration and testing, complemented by a programme of action research (M4), the research employs mixed-methods including direct observation, semi-ethnographic study, semi-structured interviews, survey (through questionnaire) and photographic survey.

3.3 Design Methodology

3.3.1 Introduction

The second part of the methodology relates to design and the application of design in meeting the aims and objectives of the research, specifically in the objective to develop, prototype and test a workable tool for the evaluation and monitoring of innovation strategies and economies.

Design, like innovation, is a concept around which there is much, and ongoing, debate in terms of how it is defined, articulated and manifest (see Design Council, 2013). Brown, 2009 states that "Design, and more broadly design thinking, can be viewed as a creative problem-solving tool that can be utilised across industries with respect to innovative products, services,

processes and even societal challenges". Buchanan (2001) argues that "one of the great strengths of design is that we have not settled on a single definition" before positing his own definition "in contribution to advancing enquiry" that design "is the human power of conceiving, planning, and making products that serve human beings in the accomplishment of their individual and collective purposes." (Buchanan, 2001). Several definitions posit design as a relational interface between other concepts. Bonsiepe (1995) describes design as "the articulation of the interface between artefact and user", the celebrated artistic director and graphic designer Paul Rand offers a definition of design as "a relationship between form and content" (Kroeger, 2008), while Simon (1996) describes design as "the creation of artefacts as interfaces between the inner and outer environments".

Design methodology, characterised by Cross (1993) as 'the principles, practices and procedures of design" is similarly contentious in terms of its expression and purpose. According to Kroes (2002), design methodology "aims at the improvement of design processes and is strongly process oriented", whereas in contrast Badke-Schaub and Voute (2018) advocate for a 'user-centred' design methodology, noting that the process-oriented methodology put forward by Pahl and Beitz (1977), while generally acknowledged as a pioneering example of design methodology in practice, is "roundly criticized for not meeting the needs and demands of its users, the designers". Badke-Schaub and Voute (2018) describe the "increasing complexity" and transdisciplinary nature of the environments and contexts in which design (and designers) must operate, captured too by Buchanan (2001) in his 'four orders of design' matrix (Figure 3.5), which demonstrates the journey of design practice over time, from its foundations in graphic design and symbols, through to product ('things') and industrial design to interactive and experience design and, latterly, to thought and systems ('environmental') design.

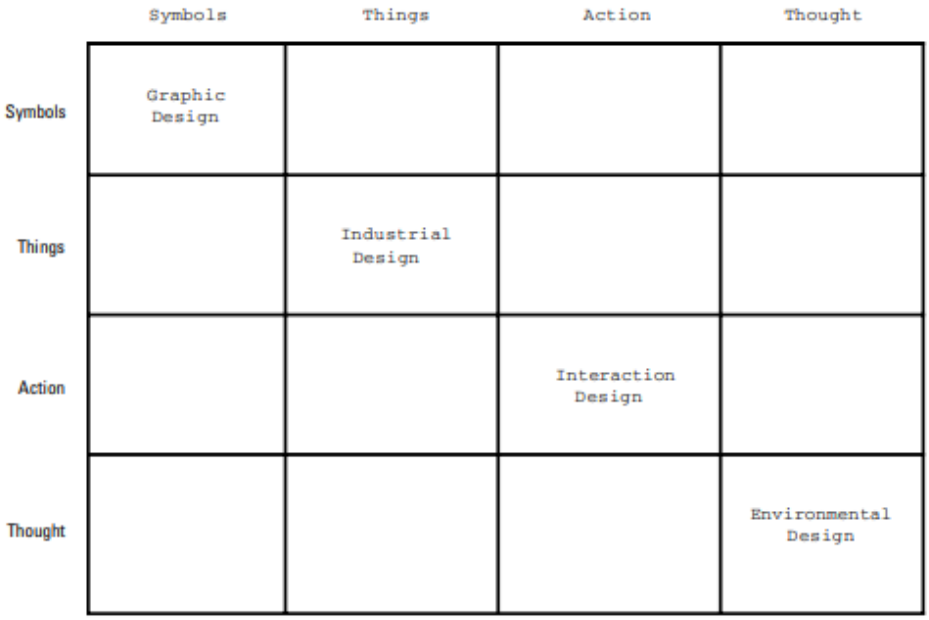

Figure 3.5: 'Four Orders of Design' (Buchanan, 2001)

3.3.2 Design Science Method

Design science research "changes the state-of-the-world through the introduction of novel artifacts" (Vaishnavi & Kuechler, 2008). In line with Buchanan's matrix (Figure 3.5), the role of the artefact has morphed from two-dimensional graphic to a three-dimensional manifest as a product, to its role as a facilitator of or in an experience, to its role as an "agent of change" in systems design (Buchanan, 2001; Vaishnavi & Kuechler, 2008).

Design science research has developed as distinguished from design by the "production not only of an artefact, but of new knowledge" (Alturki et al, 2012). The design science method has its roots in engineering and the "science of the artificial", described by Simon (1996) as "a body of knowledge about the design of artificial (man-made) objects and phenomena - artefacts—designed to meet certain desired goals" (Simon, 1996). Hevner et al (2004) describe design science as "fundamentally a problem-solving paradigm with design intent…(which)…creates and evaluates artefacts intended to solve identified organisational problems" (Hevner et al, 2004). Design science research involves "the creation of an artefact and/or design theory as a means to improve the current state of practice as well as existing research knowledge" (Baskerville et al, 2015). Johannesson and Perjons (2014) define an artefact as "an object made by humans with the intention of addressing a practical problem".

Design science “not only creates novel artefacts, but also knowledge about them, their use and their environment” (Johannesson & Perjons, 2014).

The aims and objectives of this research relate to the development of a methodology and workable tool - as a “novel artefact” - and its application as an “agent of change” within the contextual environment of innovation ecosystems, specifically in the evaluation and measurement of innovation strategies and economies. The research seeks too to create new knowledge about the tool (as the artefact), its application and use, and the surrounding context.

Development of the tool as an artefact, and the creation of new knowledge through the process of development, has therefore been supported in this research by the design science method. The method incorporates five sequential stages (Figure 3.6): 1. Explicate the problem, 2. Define requirements, 3. Design and develop artefact, 4. Demonstration and 5. Evaluation and (Johannesson & Perjons, 2014). Some articulations also add a sixth stage – communication (Hevner et al, 2004; Peffers et al, 2007), focussed on messaging and dissemination (described by Perjons, 2015 as the ‘So What?’ stage).

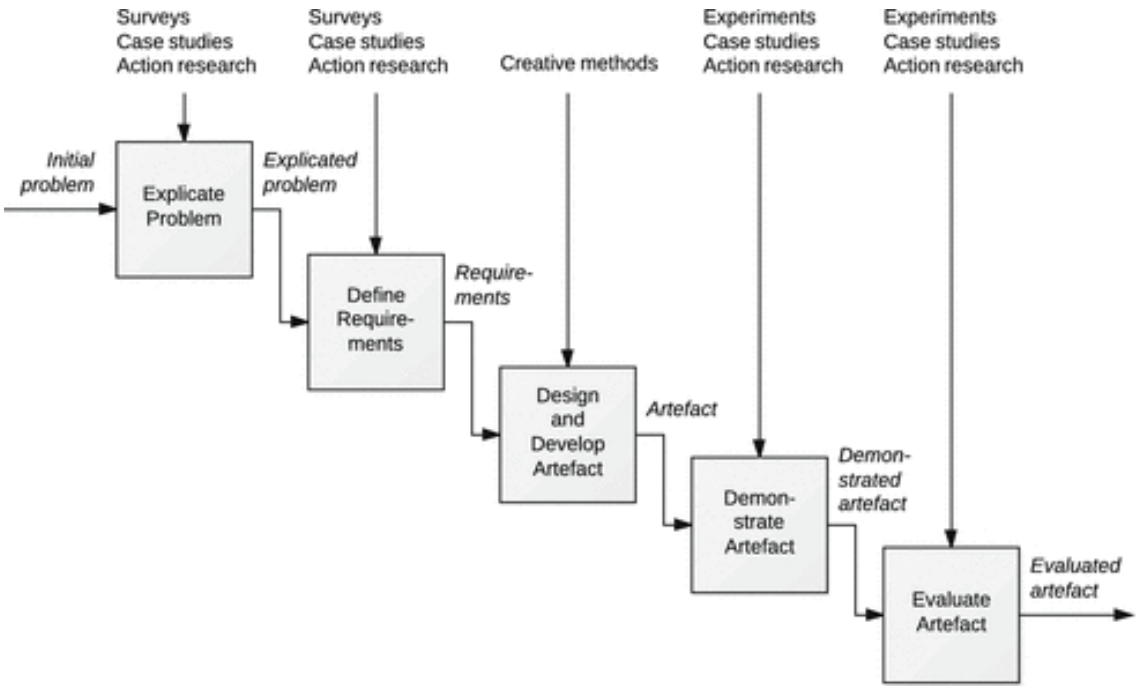

Figure 3.6: The Design Science Method (Johannesson & Perjons, 2014)

3.3.2.1 Philosophical Considerations and Fit

Related to ongoing debate about the definition, nature and purpose of design and design methodology, there are differing opinions too on the epistemological perspective of design science and its and philosophical 'fit' (Yin, 2014). Kroes (2002) argues that design science is "strongly process-oriented" and as such related to a "normative" research position, associated with positivism. Niehaves and Becker (2006) identify an 'implicit positivist assumption' in design science research guidelines citing March and Smith (1995), Cross (2001) and Hevener et al (2004) as specific examples, asserting that in all three cases, the authors "promote a positivist approach to the evaluation of design artefacts through mathematical formalisms or experimentation…(and)… presume a positivist understanding of the relationship between objective knowledge and its necessary application in practice" (Niehaves and Becker, 2006).

In contrast, Schön (1983) offers a constructivist approach to design science arguing, for instance, that "messy problematic situations" require "an epistemology of practice implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict" (Schön, 1983). Similarly, McKay and Marshall (2005) argue that an interpretivist approach to design science allows for "rigorous research to better understand the impacts of design artefacts in a real-world context" and "critical analysis of the changes in a socio-technical system due to an introduced design artefact and the impact on power relations in a given situation" (McKay and Marshall, 2005).

Vaishnavi and Kuechler (2008) suggest that the "metaphysical assumptions of design science research are unique" in that "none of the ontology, epistemology, or axiology of the paradigm is derivable from any other paradigm". Describing how the method requires both "a belief in alternative world states" (the context) and "in a single, stable, underlying physical reality" (the artefact), Vaishnavi and Kuechler (2008) further posit that a belief in the artefact and "What it is, is what it does" demonstrates a best fit with pragmatism and that the thought process employed in design science is primarily abductive (Vaishnavi & Kuechler 2008). Johannesson and Perjons (2014) opine that a design science project can use and benefit from positivist as well as interpretivist strategies and methods depending on the goal and context of the project, suggesting that interpretivist strategies in the early stages of the project could help to "obtain a deep understanding of the needs and wants of stakeholders" while positivist strategies might be better suited for "rigour" in evaluation, or interpretivist methods may also be appropriate if

there is a need to “understand the subjective experience of users” (Johannesson & Perjons, 2014).

The combination of abductive reasoning with pragmatic application of mixed methods, drawing on primarily interpretivist, but triangulated with positivist strategies demonstrates a good fit with the primarily interpretivist and abductive, but pragmatic, philosophical stance of the research.

3.3.2.2 Application of the Design Science Method

Johannesson and Perjons (2014) offer an IDEF0 flowchart (Figure 3.7), a project management model used principally in mechanics, engineering and information technologies, as a support tool for the Design Science Method. The IDEF0 flowchart delineates progress through the sequential stages of the design science method, drawing on selected research strategies and underpinned throughout by a “knowledge base”.

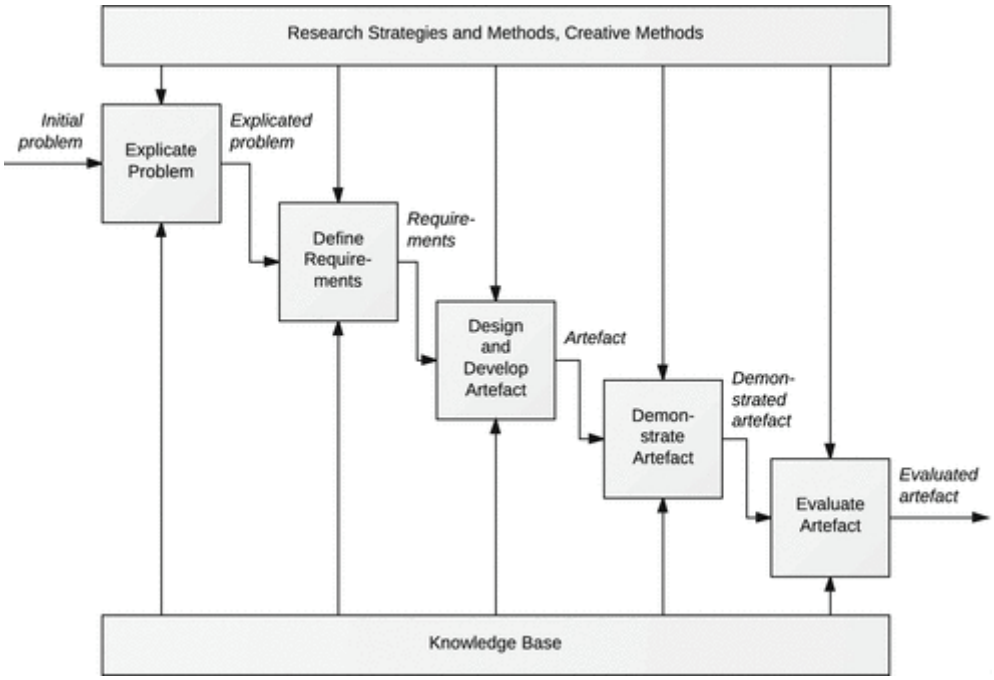

Figure 3.7: IDEF0 Model of the Design Science Method (Johanneson & Perjons, 2014)

An elaboration regarding its application to this research is presented in Figure 3.8. The approach, and elaboration, includes ‘Communication’ as a sixth and final stage.

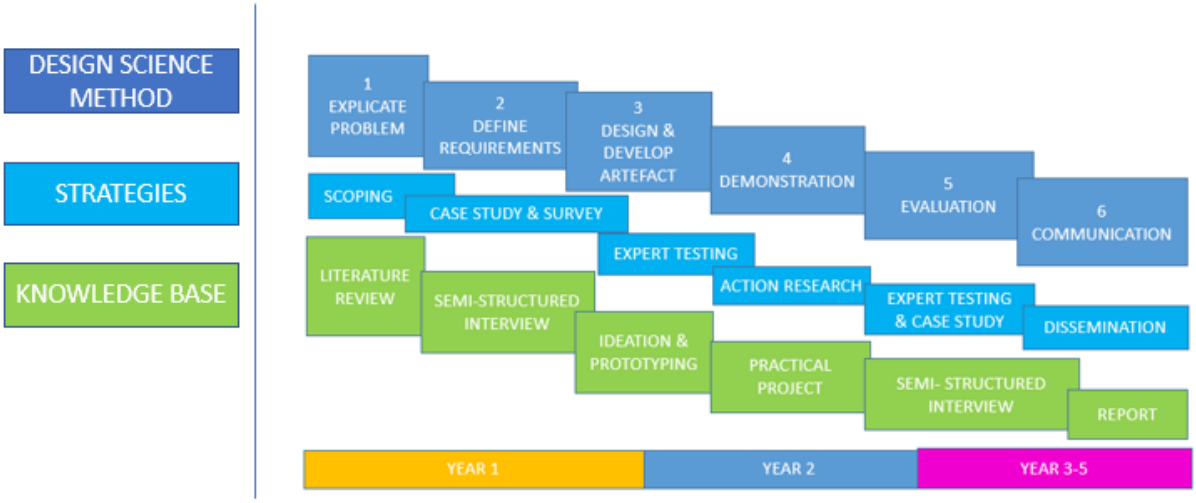

Figure 3.8: Application of the Design Science Method in this Research

The six subsections which follow detail theoretical aspects relating to each of the six subsections of the design science method and elaborate further on their application in the research.

3.3.2.2.1 Explicate the Problem

Johannesson and Perjons (2014) describe a problem as "an undesirable state of affairs, or more precisely, a gap between the current state and a desirable state". Wieringa (2015) posits that design science projects are "problem solving projects" in which resolutions are sought for two types of problem, defined by Wieringa as "*practical* problems, the difference between the way the world is experienced by stakeholders and the way they would like it to be, and *knowledge* problems, the difference between current knowledge of stakeholders about the world and what they would like to know". Knowledge problems are "solved by formulating propositions about the world", while the evaluation criterion for solutions to practical problems is found "by analysing the problem, namely by identifying solution criteria, or requirements. based on stakeholder goals" (Wieringa, 2015). Perjons (2015) asserts a correlation between the two, observing that practical problems often emerge from knowledge problems, in circumstances where "there is a knowledge gap in the research, leading to a knowledge issue of *ignorance* for practitioners" (Perjons, 2015).

For this research, a considerable amount of time was spent at 'Stage 1' of the design science method process. Problem explication activity spanned across year 1 and into year 2 of study, undertaking a broad-scope literature review and gathering multiple stakeholder perspectives through case-study, survey and semi-structured interview. Selected feedback was integrated iteratively at each subsequent stage of research, so that a focus on the identified problem (gaps in both urban development and in spatial planning strategies in support of innovation) and related "stakeholder goals" (Wieringa, 2015) was maintained throughout.

3.3.2.2.2 Define Requirements

Perjons (2015) describes this stage of the method as "a transformation of the problem into demands on the proposed artefact" (Perjons, 2015). Johanneson and Perjons (2014) assert two types of requirement: specific (features/functions) and generic (qualities), where the first category focusses on "what the specific artefact is and does" and the second is "what generic qualities the artefact should have" (Johannesson & Perjons, 2014). Perjons (2015) proposes that for each identified specific or generic requirement, the feature, function or quality is first stated and then justified with a 'because' statement, using what he calls the "universally necessary generic quality" of 'understandability' as an example: "The artefact should be easy to comprehend for the users – **because** - they need use it in an effective way" (Perjons, 2015).

Faisandier (2012) advocates for "prioritising stakeholder needs" in determining the specific requirements of the artefact, asserting that this stage should "Elicit, capture, or consolidate the stakeholder needs, expectations, and objectives as well as any constraints" and "transform the prioritized and retained stakeholder needs into stakeholder requirements" (Faisandier, 2012). Faisandier asserts six classifications of stakeholder need in what he calls 'The Cycle of Need' (Figure 3.13): real (lived, conditioned by context), perceived, expressed (wants), retained (priorities), specified (relating to the specific artefact), realised (resolution) (Faisandier, 2012). Faisandier asserts that stakeholder needs must be transformed into 'stakeholder requirements' and that this can be achieved through appraising their conceptual completeness and ensuring consistency with identified 'system requirements', that is, establishing a synthesis between 'completed' stakeholder needs (requirements) and the requirements of the contextual system. "Neither can be considered complete", asserts Faisandier, "until consistency between the two has been achieved" (Faisandier, 2012). He proposes eight characteristics of system requirements (Table 3.1), and nine tests for appraising 'complete' synthesised requirements

(Table 3.2). Both Faisandier's 'Cycle of Need' model and requirements framework were considered in the construction of the artefact in this research (see Section 4.3).

Types of System Requirement	Description
Functional Requirements	Describe qualitatively the system functions or tasks to be performed in operation.
Performance Requirements	Define quantitatively the extent, or how well and under what conditions a function or task is to be performed. These are quantitative requirements of system performance and are verifiable individually.
Usability Requirements	Define the quality of system use (e.g. measurable effectiveness, efficiency, and satisfaction criteria).
Interface Requirements	Define how the system is required to interact with external systems and internal elements within the system. Interface requirements include physical connections (physical interfaces) with external systems or internal system elements supporting interactions or exchanges.
Operational Requirements	Define the operational conditions or properties that are required for the system to operate or exist. This type of requirement includes human factors, ergonomics, availability, maintainability, reliability, and security.
Modes/ States Requirements	Define the various operational modes of the system in use and events conducting to transitions of modes.
Adaptability Requirements	Define potential extension, growth, or scalability during the life of the system.
Policies and Regulations	Define relevant and applicable organizational policies or regulations that could affect the operation or performance of the system

Table 3.1: Types of system requirements (Source: Faisandier, 2012)

Criterion	Description
Necessary	The requirement defines an essential capability, characteristic, constraint, and/or quality factor. If it is not included in the set of requirements, a deficiency in capability or characteristic will exist, which cannot be fulfilled by implementing other requirements
Appropriate	The specific intent and amount of detail of the requirement is appropriate to the level of the entity to which it refers (level of abstraction). This includes avoiding unnecessary constraints on the architecture or design to help ensure implementation independence to the extent possible
Unambiguous	The requirement is stated in such a way so that it can be interpreted in only one way
Complete	The requirement sufficiently describes the necessary capability, characteristic, constraint, or quality factor to meet the entity need without needing other information to understand the requirement
Singular	The requirement should state a single capability, characteristic, constraint, or quality factor
Feasible	The requirement can be realized within entity constraints (e.g., cost, schedule, technical, legal, regulatory) with acceptable risk
Verifiable	The requirement is structured and worded such that its realization can be proven (verified) to the customer's satisfaction at the level at which the requirement exists
Correct	The requirement must be an accurate representation of the entity need from which it was transformed
Conforming	The individual requirements should conform to an approved standard template and style for writing requirements, when applicable

Table 3.2: Test criteria for appraising synthesised requirements (Source: Faisandier, 2012)

3.3.3.2.3 Design and Develop Artefact

The next sequential stage of the process focusses on design and development where the former activity "creates and artefact that addresses the explicated problem" and the latter "ensures the artefact fulfils the defined requirements" (Johannesson & Perjons, 2014). Wieringa describes this stage as the 'trade-off' stage within which four questions must be asked and answered: 1. What are the effects of the artefact on the context? 2. Do the effects satisfy the criteria? Is there a trade-off that needs to be made by making changes to the artefact? Are there any sensitivities which suggest a need for a change to the context? (Wieringa, 2014).

For this research, the artefact was designed as a prototype (as the 'Sustainable Innovation Wheel, see section 4.3) in response to case study and survey responses, and developed further through expert testing and feedback. Further stakeholder engagement (and additional "stakeholder goals") and subsequent development came through the 'M4' action research project (see section 4.6), leading to the artefact's development and re-iteration as the 'Civic Investment Value' index (see section 4.8). Finally, given the huge shift in context resulting from the COVID-19 pandemic and its associated challenges, contextual 'sensitivities' were further explored in a second set of expert testing.

3.3.3.2.4 Demonstration

The next sequential stage of the design science process focusses on what Perjons (2015) calls "a test use of the prototype in an illustrative or real-life case which seeks to prove the feasibility of the artefact (sometimes called a 'proof of concept')" (Perjons, 2015). Johannesson and Perjons (2014) suggest that "both real-life and fictitious cases can be used for demonstration" (Johanneson & Perjons, 2014).

A number of studies, including Jarvinen, 2007; Holmström et al, 2009; Collato and Dresch, 2017; and Mullarkey and Hevner, 2018, note a marked similarity in the characteristics of action research and design science, with Collato and Dresch (2017) proposing an amalgamation of the two as "Action Design Research" would allow "problem-solving oriented research to develop scientific knowledge while simultaneously acting to solve real problems" (Collato & Dresch, 2017). Holmström et al (2009) identify a "mutually beneficial complementarity" which, they propose, "can enhance knowledge transfer and support practical relevance", and that this complementarity is both evident (and under-exploited) throughout, asserting that "it is indeed the practitioner—not the academic scientist who undertakes the basic research" in both the

design science and action research processes (Holmström et al, 2009). The ‘demonstration’ stage of the design science process is supported in this research through illustrative feasibility testing of the ‘Sustainable Innovation Wheel’ (Section 4.3) as part of the ‘M4’ action research project (Section 4.6).

3.3.3.2.5 Evaluation

The next, and in some models final (Johannesson & Perjons, 2014), stage of the design science method is the evaluation stage, described by Perjons (2015) as “activity to determine how well the artefact fulfils the requirements and to what extent it can solve or alleviate the practical problem that motivated the research” (Perjons, 2015). Pries-Heje et al (2008) posit that evaluation can be *ex-ante*, in which the artefact is evaluated without being used or even being fully developed or *ex-post* evaluation, which requires the artefact to be employed (Pries-Heje et al, 2008).

Sonnenberg and Vom Brocke (2012)’s synthesised results framework (Figure 3.9) offers a tool for researchers to select ‘best fit’ evaluation methods based on overarching factors such as epistemology. In terms of establishing a positionality for this research, there is a clear resonance with the ‘ex post’ side of the figure, which the authors assert relate to an interpretivist epistemology (correctly, in this case), a case strengthened further still by the inclusion of all three research strategies employed in the research (action research, case study and survey) featuring on the corresponding ‘ex post’ side. Given this resonance, the framework asserts a ‘Real System’ (systemic) consideration for this research, and an evaluation primarily based on the ‘Impact of Task Completion’ (Figure 3.9; Sonnenberg and Vom Brocke, 2012).

Dimensions	Characteristic Values					
Time	Ex Ante			Ex Post		
Ontology	Realism			Nominalism		
Epistemology	Positivism			Interpretivism		
Perspective	Economic	Deployment		Engineering	Epistemological	
Position	Externally			Internally		
Function	Knowledge Function	Control Function		Development Function	Legitimization Function	
Artefact Focus	Technical	Organizational		Strategic		
Artefact Type	Construct	Model	Method	Instantiation	Theory	
Method	Artificial			Naturalistic		
	Assertion	Laboratory Experiment		Case Study	Field Study	
	Simulation	Field Experiment		Action Research	Survey	
	Criteria-based Analysis	Theoretical Argument		Ethnography	Phenomenology	
	Mathematical Proof	Prototype			Hermeneutic Methods	
Realities Considered	Real Task	Real User		Real System		
Level of Evaluation	Item Received	Completed Task		Impact of Task Completion		

Figure 3.9: Framework Synthesis of Evaluation Strategy Dimensions
(Source: Sonnenberg and Vom Brocke, 2012)

3.3.3.2.6 Communication

The sixth stage of the design science method, absent in Johanneson and Perjons (2014), but present in both Hevner et al, 2004 and Peffers et al, 2007 (and referenced in Perjons, 2015), is communication.

Sonnenberg and Vom Brocke (2012) note a correlation between the 'communication' stage and *ex-post* evaluative dimensions, noting that communication is, in effect, ex-post activity in relation to research delivery (Sonnenberg and Vom Brocke, 2012). Hevner and Prat (2017) propose an 'holistic' evaluation model designed to evaluate the research as a whole (Figure 3.10) and assert that it is the results from this analysis that should form the basis of the communication stage (that is, communication based on evaluation of the research rather than the artefact) (Hevner and Prat, 2017). For this research, Hevner and Prat's model was used to inform evaluation of the prototype artefact through qualitative commentary and feedback from the ten panellists engaged in the Delphi exercise undertaken within the 'M4' action research project (see Section 4.6.3).

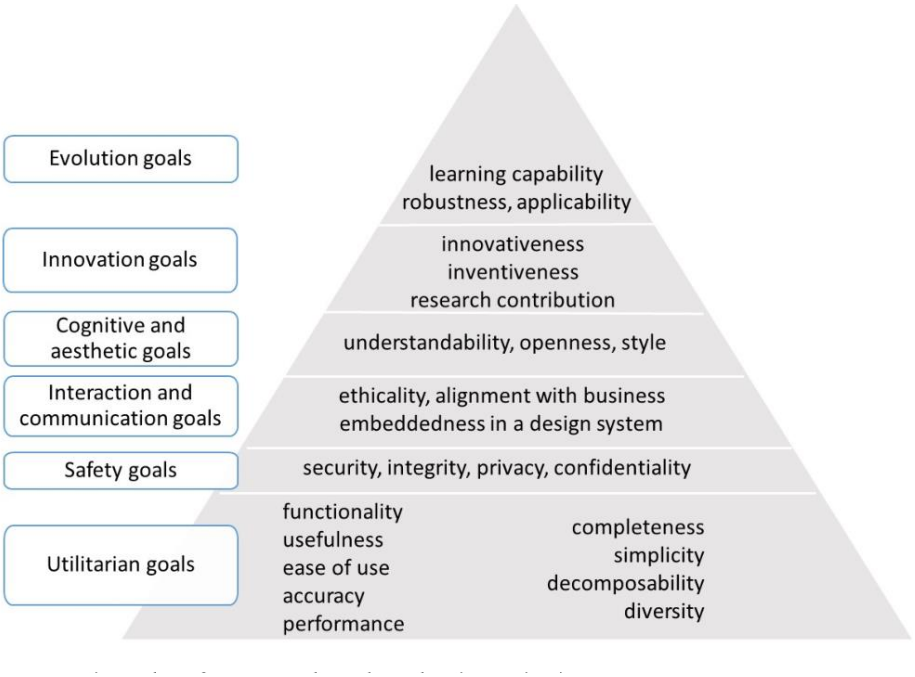

Figure 3.10: 'Holistic' Research Evaluation Model (Source: Hevner & Prat, 2017)

Peffers et al (2007) argue that communication should put forward "the problem and its importance, the artifact, its utility and novelty, the rigor of its design, and its effectiveness to researchers and other relevant audiences, such as practicing professionals" (Peffers et al, 2007), and that communication strategies might include "scholarly and professional publications".

Given the identified 'lean' of this research toward 'ex-post' evaluative dimensions, as in Sonnenberg and vom Brocke (2012), it is perhaps unsurprising that its evaluative process includes evaluation of the artefact and systemic context as both discrete and interconnected entities *and* an evaluation of the research overall (see Chapter 7). Reflections on the research feature in Chapter 7 of the thesis, along with a summary of how results and findings have been communicated.

3.4 Research and Design Methodology – Integration and Application

The nested research model (Kagioglou et al, 1998) has proven useful in summarising the initial period of study, during which a significant amount of time was spent in exploring philosophical considerations, and to selecting 'best fit' research strategies and techniques. This extended process has given the research a strong philosophical and strategic grounding.

The Design Science method provided the framework for practical development of the research. The method was followed sequentially so that, broadly speaking, Year 1 activity focussed on stages 1 and 2 of the design science process (Explicate Problem and Define Requirements), Year 2 on stages 3 and 4 (Design and Develop Artefact and Demonstration) and Year 3 (extended through interruption to 4 and 5) on stages 5 and 6 (Evaluation and Communication).

3.5 Validation, Reliability and Limitations

Research quality relies on "precise data and strong results" (Cresswell & Miller, 2000). The reliability, which Yilmaz (2003) describes reliability as "the degree to which a research instrument measures a given variable consistently every time it is used under the same conditions", relates to the instruments, strategies and methods used in the research, whereas validity relates to credibility, satisfying established research standards and identifying and mitigating against potential bias. Yin identifies four tests for validity in empirical research: construct validity, internal validity, external validity and reliability (Yin, 2003).

For this research, the nested research model (Kagioglou et al, 1998) and the design science method (Johanneson and Perjons, 2014) have been useful structures in the process of establishing construct validity, that is – in establishing that the overall research design and the research strategies and techniques used are appropriate for achieving the results that the research sets out to achieve. Both reliability and validation have been enhanced by a pragmatic use of mixed methods and in particular by reducing the potential for internal bias in utilising survey as a triangulation point for the case studies and action research. Best practice has been applied in the application of research techniques to reduce bias and increase validity, for example in utilising the Delphi technique to collect repeat data across a series of interconnected rounds as part of the action research project. External validation has come from testing the framework, emerging findings and recommendations with selected experts at several stages in the research (including at the pilot, post-case study and concluding stages). External validation has been further enhanced through the research being delivered as part of a wider project (the 'MAPS-LED' project) allowing for approach, strategies and findings to be cross-referenced with the work of other researchers operating at the same time and in the same contexts.

Limitations of the research relate primarily to time constraints and to the stop-start nature of the work, which included a one-year period of interruption and the second phase of which was delivered in the wake of the COVID-19 pandemic. Had there have been more time and more

resource, it would have been useful and pertinent to the research to understand the wider background and context to the work of those international experts engaged for interview, and to develop each of these places as case studies. Given the expansive nature of the constructs explored in the research and their applicability across multiple geographies and many layers of governance and practice, a first sift for selection of case study was made, initially by application of the Katz and Wagner (2014) innovation district typologies. Fieldwork research visits to North Carolina, selected as an example case study of an "urbanized science park" typology (and as identified in Katz and Wagner, 2014) were necessarily abandoned on two occasions in response to external circumstances and travel advisory warnings (namely Hurricane Matthew, in October 2016 and a Ku Klux Klan 'victory parade' to mark President Trump's election, in November 2016). Generating large amounts of data across two phases of work, the research resulted in a significant overall data set, incorporating over 150 expert opinions and over 100 survey responses. Given the scale of the data set and the limited time and resources available, the ongoing sifting process was necessarily clinical in its cuts, but as an unintended consequence could mean that the full richness of the data has not been revealed. One further limitation resulting primarily from the interruption and onset of the pandemic is that the research gathered at the beginning of the study was less relevant to the current context by the end, although those elements which retained relevance have been incorporated, revisited and updated through, for instance, the second set of expert testing.

3.6 Ethical Considerations

The research was delivered throughout with strict consideration of and in adherence to established ethical standards of practice. Ethical considerations for the research included obtaining prior and informed, signed consent from participants in all stages of the research, supported with provision of information about the researcher, the purpose of the research and intended use of data. A summary of this information was repeated verbally prior to every interview or event and in writing following every interview or event undertaken as part of the research. Where online surveys were undertaken for the research, informed consent was sought through an online holding page before the survey was able to be launched, with a clear statement of the participant's ability to quit the survey at any time, in line with the particular and additional ethical considerations of online surveys (Vehovar & Manfreda, 2008).

Data generated through the research was handled in line with the Social Research Association guidelines 2003, the Data Protection Act 1998 and General Data Protection Regulation (GDPR). Ethical approval was obtained from the University of Salford's Ethical Approval Panel, with ethics application number ST 16/112 (Appendix ii).

3.7 Summary of Approach

The research was delivered in two 'phases' of activity – the first from 2016-2018, pre-pandemic and pre-interruption of study, and the second during the pandemic and following interruption of study, in 2020/21. Each action in the research served to either generate, test or validate emerging theory, findings and results, and as a foundational platform for progress to the next stage. As such, the research was delivered in discrete, but interconnected and iterative stages across the two phases. A summary of the research approach and its flow and progress through stages of generation, refining, testing and validation is presented in Table 3.3.

PHASE	PURPOSE	ACTIVITY	RESULT
1	Generating Theory	Desk-based study and Literature Review	Theory scope and principles
	Refining Theory	15 Semi-structured interviews in Boston, US	
		15 Semi-structured interviews in Seattle, US	
		45 Semi-structure interviews in Greater Manchester, UK	
		Survey – Impact Hub Seattle (50 respondents) & The Federation, GM (57 respondents)	
			'Sustainable Innovation Wheel' – tool prototype
	Refining Theory	10 semi-structured interviews with key experts (UK & international)	
			Place Taxonomy
	Refining Theory & Testing Tool	M4 Action Research project	
		M4 Delphi exercise (20 semi-structured interviews in May 2017 and 20 semi-structured interviews in May 2018)	
			'Upward Spiral' Directional Flow
		M4 SI Wheel Scoring	
			CIV4.0 index
2	Testing Theory & Tool	15 semi-structured interviews in Liverpool City-region, UK	
	Validating Theory & Tool	10 semi-structured interviews with key experts (local, regional, North of England and UK/international)	Validated Theory / Tested Tool

Table 3.3: Research Approach Summary – Generating, Refining, Testing and Validation

4. Results & Findings

4.1 Introduction

This chapter presents results and findings from the research, including results from four case studies (Greater Manchester, Greater Boston – Boston/Cambridge, King County – Seattle, and the Liverpool City-region) and two sets of expert testing (The first, interviews with experts in selected places developing or employing notably open, civic or innovative economic development strategies, and the second, interviews with selected experts based in the UK and working locally, regionally, nationally and internationally within the place/innovation nexus). Results are also presented from an online survey, undertaken with community members in Impact Hub, Seattle and The Federation, Greater Manchester and two rounds of Delphi method testing, undertaken as part of the 'M4' action research project. Word frequency content analysis has been used throughout the research, and qualitative and quantitative results emerging from this analysis are presented here.

New knowledge generated through the research is also presented in this chapter, including the 'Sustainable Innovation Wheel', a new 'place' taxonomy, a new typology of spatial flow and the 'Civic Investment Value' index (CIV 4.0). The research has been delivered iteratively, and there is an observable flow between each stage of results and the cumulative knowledge generated through each stage so that, for example, the 'Sustainable Innovation Wheel' responds to results and findings in the case studies, the new 'place' taxonomy emerges from the literature review and is tested through the first round of expert testing, and the new typology of spatial flow emerges from the 'M4' action research project. The 'Civic Investment Value' index (CIV 4.0) responds to the research as a whole.

The design of the new index (as a prototype tool) is supported throughout by sequential progress through the 'Design Science Method' (see Section 3.3.3), which employs a dual focus on the artefact (tool) and the context in which it will be employed. The Liverpool City-region study and second round of expert interviews were undertaken after the onset of the COVID-19 pandemic, allowing consideration of emerging results and findings in the context of the pandemic and its seismic impacts.

4.2 Exploring Innovation Frameworks through Case Study

Research design and delivery has been shaped in support of the primary research aim, that is, to create a holistic framework for innovation which is able to meet the needs and demands of the present and the future. Case studies included in the research explore existing innovation frameworks in practice, drawing out the gaps, challenges and opportunities in terms of current and future needs.

Case study selection was based primarily on the three typologies of innovation district posited by Katz and Wagner in 2014: "anchor hub", "reimagined urban area" and "urbanized science park", aligned through knowledge generated in the literature review with science/R&D (linear), NSI (institutional) and 4H (democratised) approaches to innovation. Boston and Seattle, specifically the areas of Kendall Square and South Lake Union, respectively, were identified by Katz and Wagner (2014) as exemplars of the 'anchor hub' and 're-imagined urban area' typologies. Initial case study selection also included North Carolina, and specifically the Raleigh-Durham Research Triangle Park, identified as an exemplar of the "urbanized science park" typology and described by Katz and Wagner (2014) as "perhaps the 20th century's most iconic research and development campus and the strongest validation of this model".

Fieldwork research visits to North Carolina were necessarily abandoned on two occasions in response to external circumstances and travel advisory warnings. As such, the Oxford Road Corridor innovation district in Greater Manchester, already identified in the pilot stages of the research as an exemplar of the "urbanized science park" typology, was selected as an alternative for full case-study and analysis. A new taxonomy for place has emerged iteratively through the research, revealing four discrete typologies of place-related activity, namely 'place-blind', 'place-based', 'place-grounded', 'place-driven'. The subtle, yet potent, distinction between these typologies is explored further in Section 5.2. The Liverpool City-region was selected as a case study through which to explore the 'place-driven' typology as an approach to innovation emerging through the research.

While Kendall Square, South Lake Union and the Oxford Road Corridor are the primary focal points for case study in Boston, Seattle and Greater Manchester (as representative of the three typologies identified by Katz and Wagner, 2014) each case study is presented in the broader context of their respective city-regions and their innovation ecosystems.

An anonymized list of selected interviewees and their representative codes is attached as Appendix vi.

4.2.1 Science-led: Greater Manchester's linear approach to innovation

Figure 4.1: The Manchester skyline (Source: Author's own)

'*Manchester is a buzzing city at the forefront of change',* says Participant A (Interview, 8th December 2016), a senior figure in GM's economic development team. *'We are a city of 'doers' with a deep and proud history in production and manufacture in cotton and textiles, and a passion for social change and radical political thought and action'.* Since the mid-1990s, Manchester city centre has seen large-scale physical transformation, with vast levels of investment in its downtown core. A bomb, planted by the IRA in 1996, destroyed a large section of Manchester City Centre, prompting a sharp injection of investment in its redevelopment.

Figure 4.2: Scenes from the Manchester City Centre bombing, 1996 (Source: ft.com)

Between 1996 and 2016, Manchester's GVA grew by 83 per cent (GM Industrial Strategy, 2019). Following large-scale physical regeneration programmes in the 'outer ring' areas of Hulme and East Manchester (the latter led by the New East Manchester Urban Regeneration Company, a pioneering partnership model bringing together the City Council, English Partnerships and the North West RDA), and under the twenty-year leadership of Sir Howard Bernstein as Chief Executive and Sir Richard Leese as elected Leader of Manchester City Council, Manchester gained a reputation for effective and efficient public-private partnership working in large-scale regeneration and development, characterised as 'The Manchester Model' (see Tomaney & McCarthy, 2015). This model became a blueprint and pre-cursor for the formation of the Greater Manchester Combined Authority (GMCA) in 2011, which in turn became a blueprint model for (and driver of) devolved regional governance (RSA, 2014). The city's economic growth since that period has been characterised by a strong property development sector and financial services offer, its leading industrial specialisms in advanced manufacturing, healthcare and bioscience, and latterly its strengths in media, digital technology and the creative industries (New Economy, 2014; GMCA, 2017).

Figure 4.3: Street Art, Northern Quarter, Manchester. (Source: Author's Own)

"*Creativity is in our soul*", says Participant A2, another senior colleague from the GM economic development team. "*Tony Wilson put us on the map in the eighties and Madchester set it on fire in the nineties. Now, our creatives and techies are leading the charge and taking Manchester out to the world. I think there's a particular Manchester way of doing things which is about ingenuity, pragmatism and top of the pile, pragmatism. We do things that matter, we*

make a difference, we do it creatively and we look cool while we're doing it" (Participant A2, interview 18th January 2017).

Figure 4.4: Map of the Greater Manchester City-region (Source: Britannica.com)

Manchester and the wider Greater Manchester (GM) city-region is at the forefront of the devolution agenda in UK (RSA, 2014), which as well as devolved governance at a national level to Scotland and Wales has seen certain powers and budgets devolved to a number of city-regions from central UK government. In 2017, Andy Burnham was elected as the first-ever Greater Manchester Mayor and the first of nine directly elected city-regional Mayors across England. Mayor Burnham's election manifesto, 'Our Manifesto' (MEN, 2017), was co-created with a 'citizens jury' of citizen representatives from across Greater Manchester. The Mayor's first formal actions in office, building on that manifesto, was to establish the Mayor's Homelessness Fund and the Manchester Homelessness Partnership. Devolution has also seen a priority focus on nurturing the city-region's recognised and potential strengths in digital technologies, health innovation, life sciences and advanced manufacturing as key industry sectors, including establishment of a dedicated £40 million Life Sciences Investment Fund, the Mayor's £2m Digital Talent Development Fund (2017) and continued capital investment including Manchester Metropolitan University's new £35m School of Digital Arts (SODA), launched in January 2021 and the launch, also in January 2021, of the University of

Manchester's £25m Christabel Pankhurst Institute for Health Technology Research and Innovation, a new cross-disciplinary institute focussed on "unlock synergies between our strengths of health and materials plus digital and biotechnology" (GMS, 2017).

While devolution has been broadly welcomed, there remains a sense of frustration that only selected budgets and powers have been devolved, with many of the major budget lines (such as skills) and their associated administrative budgets, retained in central control. "*We have been lobbying Whitehall to give us our ball back for years*" says Participant A3 (Participant A3 interview, 4th March 2017), a senior figure at Manchester City Council. "*We don't need to be babysat or hand-held and we have been proving that we can do partnership working across GM for more years than this Government have been in Government. We are happy to have been given additional budgets and money, of course. But there is always room for more*" (Participant A3 interview, 4th March 2017).

Figure 4.5: Media City, Salford (Source: mediacityuk.co.uk)

Economically, GM is a story of two halves. Greater Manchester is third-largest metropolitan city-region in the UK, with 2.78 million people living across its ten boroughs and 553,000 living in the city of Manchester at its core (GMCA, 2017). In 2017/8, GM was ranked as the third largest city-regional economy outside London, with total GVA of £66.4 billion (ONS, 2018). Between 2013 and 2017, Greater Manchester saw £401.1m public sector investment

through the GM Core Investment Team (GMCA, 2017) and the GM Forecasting Model 2017 forecast its potential to grow at an average of 2.2% per year between 2015 and 2035, equivalent to an additional £32.4bn of economic activity and a growth rate faster than the UK (1.8% per annum).

At the same time, Greater Manchester is the third most deprived LEP area in England (GMCA, 2017) and Manchester is the sixth most deprived local authority area in the country (Indices of Multiple Deprivation, 2019). Almost a quarter (23.3%) of areas across Greater Manchester are within in the top 10% most deprived areas in England (GMCA, 2017). 620,000 people are living below the poverty line in Greater Manchester, including 200,000 children, representing 26% of all children across GM (GMPA, 2020). GM lags behind the UK on almost all measures of public health (IGAU, 2019). Life expectancy at birth for both male and female new-borns in 2015-17 was almost two years lower in GM than for England as a whole, at 77.8 and 81.3 respectively (ONS, 2018). Further, there is evidence of inequalities within GM, with life expectancy at birth for males (2013-17) as low as 69.9 years in parts of Oldham, compared with 84.9 in parts of Stockport – a gap of 15 years (ONS, 2018). Eight thousand people in Greater Manchester are registered as homeless, and eighty thousand more waiting on the list for social housing (BBC, 2020). "*It's an absolute joke*", says Participant A4, a leading business figure in Manchester (Interview 14th December 2016), "*when we get this award as the most liveable city or the best city to start a business or whatever, when the actual experience of living and working here is that there are people living in tents and in doorways. Manchester may well be the best city to live for some, but it's a different view from a cardboard box*" (Participant A4, interview 14th December 2016). Participant A5 (interview, 7th June 2017), a Manchester-based journalist, observes that rough sleeping is a relatively new, but rapidly growing phenomenon in the city: "*Apart from the odd old guy with a scraggy beard and a trolley, you never used to get homeless people in Manchester, not until I would say sometime around the mid-2000s. I'm not sure what happened, but it's just getting worse and worse and I'm not sure if Burnham is helping or if we are getting a reputation as a city for homeless people. I mean he is Mayor right? What's the point asking for bits of money here and there, why not just crack on and build whatever housing is needed*? " (Participant A5, interview 7th June 2017).

Figure 4.6: Tent camp of rough sleepers on St Ann's Square, Manchester, 2017 (Source: Author's Own)

The Greater Manchester Strategy (GMS) - subtitled "Our People, Our Place" (2017), sits as the overarching strategic document which guides the collective direction of the Greater Manchester Combined Authority (GMCA), which in turn incorporates ten local authorities, twenty-three public agencies and various sector-specific representative bodies and delivery partners. 'Innovation' is stated as one of ten strategic priorities within the GMS, attached to the goal of 'being recognised as global centre for Science and Technology' (GMCA, 2017). The GMS states that an estimated 53,000 people across GM are employed in the science sector, generating in excess of £5bn GVA per year, and 63,500 people in the creative and digital industries, generating GVA of £3.1bn per year (GMCA, 2017).

Greater Manchester's investment in capital assets strongly reflects its support for science and technology as strategic priorities. Capital assets within the science and biomedical portfolio include the Oxford Road Corridor, which hosts both the National Graphene Institute and Graphene Engineering Innovation Centre, CityLabs (a 94,000 sq. ft state of the art bio-medical facility) and Manchester Science Park (MSP), home to over 170 companies in the life sciences and biotechnology sectors (GMLEP, 2020). Key assets in the digital and creative industries cluster include The Sharp Project, a creative and digital production space initiated with £18m investment from Manchester City Council, and Salford's Media City UK, a 200-acre mixed-

use creative and media campus which hosts both BBC and ITV studios, and which is backed by Peel Land and Property Group and Legal and General Capital.

Greater Manchester is the only city-region in the UK to have developed its own Smart Specialisation (S3) strategy. Submitted in November 2013, slightly ahead of the official S3 strategy for England. Participant B, a senior figure in GM's economic development team, describes this as '*idiosyncratic of Greater Manchester'* and '*indicative of the lack of investment in GM's innovation portfolio from national funding bodies. European funding has been much better to us. We just thought we'd do it ourselves'* (Interview, 13th December 2016*).* The GM S3 strategy identified advanced materials (including Graphene) and health innovation (including e-health, stratified medicine and cancer research) as its smart specialisms (New Economy, 2013). "*There is no doubt"*, said Participant B, "*that in our selection of specialisms and in the collaborative approach we apply on all levels, we are inspired and influenced by the City Fathers who were radical innovators, scientists and industrialists, and led this city through innovations in textiles to become Cottonopolis"*. The process of S3, and in particular the peer-review process via the European S3 platform '*clarified and consolidated our strategic thinking'*, according to Participant B and, whilst there is no formal review or reporting attached to the strategy, as is required as an ex-ante conditionality for the majority of S3 strategies, its principles have instead been '*embedded into other GM-level strategies, and in particular influenced the direction and priorities for the GMS'* (Participant B, Interview 13th December 2016).

The GM Local Enterprise Partnership (LEP) area was allocated over £356 million of European Structural Funds for its delivery programme 2014-20, including £52m for Science and Innovation projects and £138m for Skills, Employment and Inclusion (NWEU, 2014). Manchester received a further £23m from the UK's member-state allocation of European Structural Funds, invested as EU match for the £61m National Graphene Institute (IfG, 2020).

4.2.1.1 GM Innovation Districts

4.2.1.1.1 The Oxford Road Corridor

The Oxford Road Corridor ('The Corridor') is a 243-hectare site (ORCP, 2018) to the south of Manchester city-centre. It is widely acknowledged as GM's leading innovation district, accounting for 20% of the city's GVA (£3.6bn) and 50% of the innovation assets of the Greater Manchester region (Pro Manchester, 2019). The Corridor is home to the University of

Manchester, Manchester Metropolitan University and Manchester University NHS Foundation Trust (MFT) and a number of flagship capital assets in the GM portfolio including Manchester Science Park, CityLabs biomedical facility, the National Graphene Institute and the Graphene Engineering Innovation Centre. In October 2017, Manchester Science Park launched the £14m Bright Building as a new headquarters for Innovate UK's Internet of Things city demonstrator, City Verve, and home to Mi-IDEA – a post--accelerator innovation centre, operated in partnership with global technology conglomerate, Cisco.

"*We have the largest university campus in the EU*", says Participant B2, a leading figure in Manchester's Inward Investment Agency, MIDAS (interview 18th April 2017). *We need to be pushing that more and making sure our big globals recruit locally. We need to be competing with Oxbridge*" (Participant B2 interview, 18th April 2017). Participant B3, a colleague at MIDAS, says that encouraging talent attraction and graduate retention is one of the key objectives behind establishing the Oxford Road Corridor Partnership (in 2017). "*We are creating a critical mass of capital assets and a talent pipeline to match. We want to be able to go to MIPIM and the world stage and be confident in being able to say to people if you locate your business here, you will have access to world-class facilities and world-class talent*" (Participant B3, interview 18th April 2017).

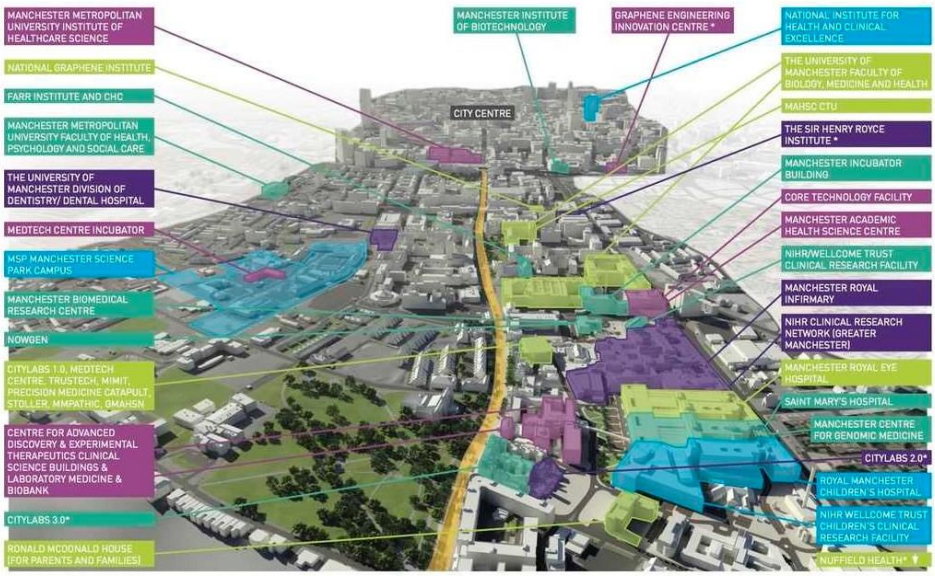

Figure 4.7: Oxford Road Corridor Health Innovation Assets
(Source: Health Innovation Manchester)

In addition to the scale of investment in its innovation assets infrastructure and 'talent pipeline', 'The Corridor' is currently subject to a £122m project designed to transform its transport connectivity (TfGM, 2018) and is home to a number of leading cultural institutions including The Manchester Museum, Royal Northern College of Music and the RIBA prize- winning Whitworth Art Gallery alongside a raft of residential and retail developments, including the in-development Circle Square, a £2.4m mixed-use commercial and residential development which will create a green space offer and a "cultural pavilion' at the centre of the Oxford Road experience" (Bruntwood, 2015). The Corridor is home to 42,000 residents, representing a 28% rise in residential living since 2012. A further 8,000 residential units are set for delivery through the Circle Square development.

Figure 4.8: Manchester Science Park Citylabs 2.0 (Source: Manchester Science Partners)

Participant C, a senior figure at the GM Local Enterprise Partnership (GMLEP), who refers to The Corridor as "*our shop window to the world*", notes the commercialisation of Graphene as "*a huge success for the city, which has elevated us to be ranked among the top cities of the world in terms of innovation. It puts the message out there to international academics that*

Manchester is a place to come if you want to change the world and win a Nobel Prize while you're at it". The Corridor has, Participant C says, not only been critical to establishing international connections, but also in "*being able to connect with the big cities of the Northern Powerhouse. We know that 'the North' is a big agenda for Government and we want to make sure that we are working with partners across the piece to make the case for the North of England as a superb place to live, work, visit and invest. We might like to think we're competing, but if you look at us from an international perspective, it's only 100 miles or so across the M62 corridor. If that was in America, it would be the same city*" (Participant C interview, 13th December 2016).

The nature and sequence of The Corridor's development, and its rapid extension via Manchester Science Park and away from the city-centre to the south and across the county boundary to Cheshire (described as a '*fuzzy boundary'* by Participant C) makes it a good fit for Katz and Wagner's 'urbanized science park' innovation district typology, typified by 'sprawling areas of innovation, urbanizing through increased density and an infusion of new activities including retail and restaurants'. (Katz and Wagner, 2014).

Figure 4.9: Manchester Oxford Road Transport Improvements render, 2018 (Source: TfGM)

Despite the scale of investment in The Corridor's transport infrastructure, several participants

in the case-study noted difficulty and frustration with virtual connectivity, pointing in particular to limitations in cross-GM network provision, put down to Participant C2, a leading figure in Manchester's burgeoning Createch sector (interview 5th August 2017) to "*territorial in-fights about who lays what wires where*". "*We definitely need to* get *more coordinated, or we are going to lose advantage. We need to make sure that every time we put a new Metro line in or rip up the roads for buses, we throw a few broadband fibres in there too*" (Participant C2, interview 5th August 2017).

Other gaps and areas of challenge noted by interviewees were limited transport connectivity between 'The Corridor' and Manchester Airport, and onward from the airport itself ("*I still have to go through Heathrow to get the west coast of America. Even some of the European connections are poor - I needed to go to Malaga a few weeks ago and had to make three stops*" – Participant C3 interview, 18th August 2017) and a call for more targeted support for start-ups: "*There's a big focus on inward investment and getting big names into the Science Park and Oxford Road. We could definitely look into mentoring and supporting access to VCs and acquisitions. It's all about spinning up, if you look at what they've done in Greenwich with business support and cheap office space. We have a similar opportunity here to really push that home-grown innovation. But to do it better."* (Participant C4 interview 8th September 2017).

4.2.1.1.2 Media City

Media City UK is a 200-acre digital and creative industries hub which sits to the west of central Manchester in the neighbouring city of Salford. Described by Participant D as '*the greatest concentration of digital media outside of London*' (Participant D interview, 4th January 2017), Media City is backed by Peel Land and Property Group and Legal and General Capital. The district is home to over 250 companies, accounting for over 7,000 jobs (GMLEP, 2020) and is anchored by the BBC and ITV as key tenants. Media City also hosts a University of Salford campus and key cultural assets such as The Lowry Theatre and Industrial War Museum North. Built primarily between 2007 and 2013 on the post-industrial area of Salford Quays, Media City is an example of a 're-imagined urban area' typology of innovation district, which as Katz and Wagner (2014) observe are 'often found near or along historic waterfronts, where industrial or warehouse districts have undergone or are undergoing a physical and economic transformation'.

Media City is the flagship offer in the City of Salford's bid to become what Participant E, a senior executive at the Local Authority, calls '*not a smart city, but <u>the</u> smart city'* (Participant E interview, 4th January 2017). In 2017, Salford returned the highest percentage increase in digital and technology start-ups in the UK, the first city to surpass London (MCUK, 2017). With a five-year plan for 'upskilling' almost 10,000 local residents in line with 'Phase 2' of Media City's development (which includes Media City's tallest building, at forty-one storeys, and which will realise an additional 1,300 residential units on site, including over 600 on-site units for University of Salford students), Participant E says that people are at the heart of Salford's plans for Media City's future progress: "*Too many smart schemes operate on analogue and metrics. We want to start with our people in Salford and ask two simple questions as the basis for long-term 'evaluation': what does the smart city need from our people and what do our people need from the smart city? If we can achieve both, we'll know we are on the right track"* (Participant E interview, 4th January 2017).

Figure 4.10: Media City UK – Aerial View (Source mediacityuk.co.uk)

Alongside this aspiration for local impact and legacy, there is a strong focus on inward investment attraction. "*What we've been able to do here*", says Participant E2, a senior leader at Media City (interview 15th February 2017), "*is to offer the world-class quality, networks and location that you would expect in London, in Singapore or anywhere in the world, but to offer*

it at a fraction of the price and a quarter of the overhead costs. Isn't that the trick that all 'innovation districts' want to pull off?" (Participant E2 interview, 15th February 2017).

Participant E3, an elected leader in Salford, notes the importance of the public/private partnership behind Media City's development and, in particular, the resulting "*ability to be fleet of foot in planning decisions and to slice through the usual red-tape and bureaucracy to just secure the deal*" (Participant E3, interview 20th February 2017). Participant E3 adds that, although Manchester has an established reputation for collaborative delivery (through 'The Manchester Model'), "*collaboration is nothing without your neighbours. Manchester likes to say they do things differently and that it has all the cultural heritage and creative capital, but let's not forget that Lowry, and The Smiths and Joy Division actually came from Salford*". (Participant E3 interview 20th February 2017).

In 2021, the BBC announced its intention to double its footprint at the Media City UK site, with the planned relocation of its BBC News production team and its 400 staff members (BBC News, February 2021).

4.2.1.1.3 The Sharp Project

The Sharp Project, on the eastern fringes of central Manchester, is another example of a 're-imagined urban area' typology and shares a similarly post-industrial heritage. Its capital development also took place between 2007 and 2011, noted as a 'boom' period for the digital and creative industries (New Economy, 2014). In a competitive environment for related assets and capacity, The Sharp Project was developed as what one civic leader from Salford described (off-record) as '*Manchester's answer to Media City'*.

Based at the former SHARP distribution warehouse site on Oldham Road, East Manchester, The Sharp Project is a 200,000 sq. ft office, co-working and TV and film production studios, with a specific focus on digital and media content. Home to over 60 businesses, and generating an estimated £21m in business revenue, the project's continued success is attributed by Participant F to adhering to a strict tenant admission policy (Interview, 12th January 2017): '*These days most people are 'digital' even if you're a stonemason or a pig-farmer or something, so really our question is 'Will you add to the ecology of the site?',* and to maintaining its strong links to the SHARP heritage brand, and the local community: '*This is not a public building, but it is engrained into the fabric of the locale – many of our business owners, members and*

apprentices live locally which gives us roots. Maintaining those links as part of the brand integrity has been important. It keeps us real'.

Figure 4.11: The Sharp Project interior (featuring shipping container workspaces) (Source: The Sharp Project)

The Sharp Project offers a range of memberships from freelance day passes to large-scale office rentals. The building houses a shared café and meeting space area ('The Campus'), studio spaces, office spaces, and individual workspace facilities which are hosted in repurposed shipping containers, which Participant F2 (Interview 14th January 2017) notes "*might be pretty ubiquitous now, but then it was new and a bit edgy to be offering that kind of high-grade space on low rents and flexible terms. Mixing small start-ups and independents in those containers with big guns in like Bet Fred, Ward Hadaway, Eon Reality makes for a Northern Quarter vibe, in a strictly business infrastructure. It's become a business community – you get a strong sense of community, but an even stronger sense that everyone mean business*". (Participant F2 interview, 14th January 2017)

The Sharp Project has gone on to launch two sister-sites, The Enigma Project (a coding skills and training facility at neighbouring One Central Park) and Space Studios (a film and production studios in the Gorton suburb of Manchester, located to the south-east of the city centre). "*Manchester has become a natural destination for global digital and creative media talent and The Sharp Project has not only become our flagship in that but is helping us to grow our own talent too. Skills development is the key legacy for everyone involved. Enigma will be hosting a software computing and coding school, and we are offering apprenticeships through Sharp Futures and Space Futures programmes. There are plans in the pipeline for training facilities with Oldham College and other partners along the corridor too"* (Participant F3 interview, 4th January 2017).

Development of The Sharp Project and One Central Park sites has spurred further investment in the area and catalysed the emergence of a new 'innovation corridor', extending north-eastward from the centre of Manchester toward the boroughs of Oldham and Rochdale. Backed through a public/private partnership between Oldham MBC and global telecommunications company Telefonica and working with local digital start-up 'Hack Oldham', the Oldham Wayra incubator space was launched in October 2017. Telefonica's investment in Oldham has seen a former Wetherspoons public house transformed into a cutting edge co-working space, hosting a globally connected ideas accelerator programme for GM-based digital start-ups whose work is focussed on tackling economic and social inequalities. Describing Oldham as having the potential to become "*the Shoreditch of the North*", Participant F4 describes how Wayra is *"committed to making a difference and to applying big thinking and big doing to big challenges. This incubator is looking at the poverty premium, basically the fact that it costs you more to live every day if you are poor, and the poorer you are the more it costs, so you might not have enough to do a 'big shop' once a week, for example, and in the end, you end up paying £1 for beans when you could get a multipack for £1.50. This extends to every area of life – shopping, transport, rent, energy costs – you name it. So, we are here to help with that. There would be no point us setting up shop in the business district to explore these issues. We have to keep it real*." (Participant F4 interview, 3rd February 2017).

4.2.1.1.4 NOMA

Figure 4.12: NOMA, Manchester - skyline render (Source: arup.com)

The NOMA (North Manchester) development is anchored by the Co-op's Angel Square

headquarters, a £105m landmark building, which was opened in February 2013. NOMA is a 20-acre mixed-use redevelopment scheme which centres on commercial office space for digital and creative industries, alongside retail and cultural spaces. In December 2015, Sadler's Yard was opened at the heart of the NOMA development; the first public square to be developed in central Manchester since Exchange Square in 1996. Sadler's Yard is home to The Pilcrow Pub, which was self-built by members of the local community and which continues to operate as a co-operatively owned enterprise. Public consultation around the Sadler's Yard development was supported by Standard Practice, a social enterprise start-up specialising in urban design and place-making who are now based at Sadler's Yard 'Plant NOMA' makerspace and who lead on citizen participation for the NOMA development partnership. Participant G describes Standard Practice's role in the NOMA development as "*presenting threads to pull on in the fabric of the city that prove that your individualism can affect change. Places work best when everybody is involved with building them. So, our key challenge is how can we provoke participation in place? How do we help people to feel like protagonists instead of passengers*?" (Participant G interview, 15th February 2017).

Figure 4.13: Federation House, Manchester (Source: Author's own)

‘The Federation’, launched by the Co-op Digital as anchor space in the NOMA ecosystem in January 2017, is home to thirty small and medium-sized digital businesses, including Northcoders coding skills and training facility and the UK base for global software consultancy, Thoughtworks. The Federation is based at the formerly disused (and Grade 2 listed) Federation House, one of a suite of Edwardian baroque buildings in the area with strong heritage links to the beginnings of the Co-operative movement. ‘The Federation’ is spaced across the building’s eight floors, including a co-working floor which houses over 250 freelancers, microbusiness and small business members. Membership of The Federation is governed by a code of ethics and strictly limited to tech companies who are working to advance social progress. Participant H explains that: “*The building is just a skeleton, it’s not the fixtures and fittings that will bring this place alive; it’s the people. There’s a great quote from Vivek Wadhwa about it not being academia, industry or military research that created Silicon Valley, but the people. Our people and the richness and connectivity of our relationship networks will ultimately determine Federation’s success, so we are filling this building based on shared values of cooperation. Innovation is not about what you make, it’s about how you make it”.* (Participant H interview, 15th February 2017).

4.2.2 NSI in the USA: Boston/Cambridge and the Techno-Economy

Figure 4.14: Sign in a Boston shopping mall, July 2016 (Source: Author’s own)

The Greater Boston metropolitan area is home to 4.9 million people (City of Boston, 2020). Greater Boston is on the Northeast coast of North America and is a huge megalopolis, which not only includes the City of Boston and its neighbouring city of Cambridge, but the counties of Suffolk and Middlesex and several municipalities of significant size and population such as Massachusetts, Manchester, Providence and Rhode Island.

Figure 4.15: The Greater Boston City-region (Source: Britannica.com)

The city of Boston – colloquially known as 'Beantown' - is home to approximately 690,000 residents, making it the 21st largest city in the country by population (City of Boston, 2020). Data from the annual American Community Survey (ACS) shows that Boston is a relatively young city, with a median age of 32.1 (ACS, 2018). 39% of the Boston population is between the ages of 20 and 34 years old (ACS, 2018). The City of Boston has a mixed demographic in terms of racial and ethnic backgrounds, with 44% identifying as White, 23% as Black or African American ethnicity, 10% as Asian and 8% as Hispanic (City of Boston, 2020).

Figure 4.16: Boston Harbour, July 2016 (Source: Author's own)

Boston and Cambridge form the epicentre of Suffolk County and of the Greater Boston metropolitan area. Boston accounts for over 657,000 jobs, equivalent to 96% of total jobs in Suffolk County. Over 71% of Boston's population are employed in 'white collar' jobs and over 50% have a college degree (City of Boston, 2020). 77.4 % of the Cambridge population have either a four-year bachelor's degree or a graduate degree by the age of 25. The education sector is a prominent player in the Boston/Cambridge area, accounting for 24.3% of total employment. Boston and Cambridge host over one-hundred public and private universities and higher education colleges, including Harvard, MIT (Massachusetts Institute of Technology), Boston University and North Eastern University.

Figure 4.17: Downtown Boston, July 2016 (Source: Author's own)

Boston was first incorporated as a town in 1630 and then as a city in 1822, making it one of the oldest cities in the United States and a recognised centre of 'traditional' US cultural heritage. It has a well-established municipal arts and cultural offer, anchored by the Museum of Fine Arts (established in 1870) and the Institute for Contemporary Art (founded in 1936). In 2014, under the auspices of Mayor Marty Walsh, the City of Boston undertook a year-long public co-production process to develop the 10-year 'Boston Creates' cultural strategy. The process included artist-led 'community conversation' events, focus groups, public meetings and online surveys, and evidenced engagement of over 5,000 Boston residents. At a cost of $1.4m, funded through foundation grants, both the nature and extent of engagement, and the resulting strategy have proven contentious (with 'The Boston' magazine referring to the process as "a series of kumbaya sessions and generic platitudes" – The Boston, 2016), but Participant I credits the initiative with democratising the city's cultural identity, previously '*dominated by the Freedom*

Trail and a colonial vision; very much the Boston of yesterday', and moving its municipal artistic profile away from 'overly dominant institutions' to a "*21st century, millennial mind-set, which is not about who has got the most money, but who has got the most innovative ideas*". (Participant I interview, 8th July 2016).

Interestingly, and to some extent as a result, a number of innovation initiatives are hosted within the Mayor's Office Arts and Cultural portfolio, such as the municipal programme of micro-grants for 'citizen innovation', conceived and administered, since 2016, through the 'Boston Creates' network. "*Innovation happens when culture and the economy clash together*", says Participant I. "*We have innovation here because we have artists here and we have strong cultural identities here. That's the creativity, that's the spark. By supporting citizen creativity through our new programme of micro-grants, we're investing in an organic innovation infrastructure. We are just watering the seedlings".* (Participant I interview, 8th July 2016).

Figure 4.18: Public Art along the Greenway, July 2016 (Source: Author's own)

4.2.2.1 Boston/Cambridge Innovation Districts

Anchored in particular by the presence of Harvard and MIT and supported by an intensive programme of public and private investment in education, financial services, life sciences and technology as key sectors, the Boston/Cambridge area is widely acknowledged as a global innovation 'hot-spot'. The area has twice beaten San Francisco Bay/Silicon Valley to the US

Chamber of Commerce Foundation's 'Innovation that Matters' number one ranking (in 2016 and 2017), with the associated reports noting 'connectedness and access to human capital' as key strengths, along with the symbiosis of the Boston/Cambridge relationship and their combined ability to "attract talent, increase investments, develop specializations, create density, connect the community and build a culture of innovation".

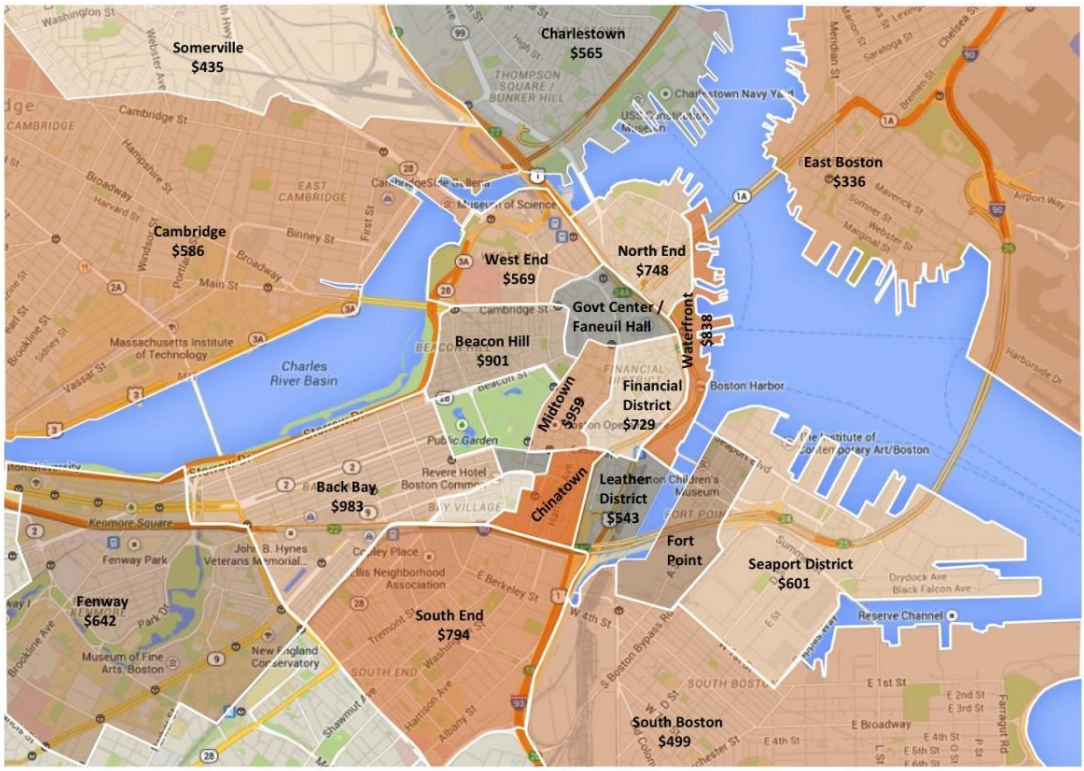

Figure 4.19: Boston Zoning Map (Source: BRA)

The civic leadership of Boston has been instrumental in driving forward 'civic innovation' programmes. In 2010, the Mayor's Office (under the Menino administration) launched the 'New Urban Mechanics' programme (MONUM; see Rissola et al, 2019). MONUM operates as a 'civic innovation space', hosting an open call to citizens to submit and brainstorm 'innovative ideas' with the city's research and design team and underpinned by a programme of civic research ('The City University'). Its programmes include support for more diverse housing options, road safety initiatives and an investment programme in 'Third Spaces', described as community spaces that sit between 'work' and 'home'. The Menino administration was also a key instigator of the 'MassChallenge' programme, a start-up accelerator initiative launched in 2010 which has since accelerated more than 1,900 start-ups (globally), raising more

than $4.3 billion in funding and generating $2.5 billion in revenue (MassChallenge, 2019). Operating as a 'not for profit' MassChallenge is primarily funded through corporate donations, with key partners including Facebook, Microsoft and Vertex.

The presence and programmes of the not-for-profit initiative Venture Café New England have also been pivotal in creating the noted connectivity which characterises the Boston/Cambridge innovation ecosystem. Venture Café started in 2010 as an informal weekly Thursday 'meet up' for innovators and entrepreneurs held at Kendall Square's Cambridge Innovation Centre (CIC). The CIC's 'Thursday Gathering' events continue over ten years on, during which time Venture Café has added a number of innovation spaces across the city to its management portfolio, including District Hall in the Seaport District in 2013 and Roxbury Innovation Centre in 2015. In 2019, Venture Café expanded its operational footprint outside of the city, launching Venture Café Providence and District Hall Providence. In late 2020, under the leadership of a newly appointed president Daniel Vidana (formerly manager of the District Hall space) and with a new mission to 'significantly enhance the diversity of the Boston innovation community', the Venture Café initiative changed its trading name to Innovation Studios.

4.2.2.1.1 Kendall Square

Figure 4.20: Kendall Square 'T', August 2016 (Source: Author's own)

Kendall Square, described by Katz and Wagner (2014) as 'the iconic innovation district' is anchored by the Massachusetts Institute of Technology (MIT), and home to over 80

international corporates, including Microsoft and Google. The Cambridge Innovation Centre (CIC) opened in 1999 and houses 170 small and medium-sized digital and tech companies, alongside a co-working and incubation space for start-ups and entrepreneurs. In a neighbourhood dominated by large, privately owned and security-conscious corporates and companies, the CIC sits at the heart of the 'innovation scene' in Kendall Square, hosting a range of events for its members (including salsa classes, quiz nights and yoga and meditation sessions) and weekly networking sessions, which are open to all.

Participant J, a senior executive at the Cambridge Regeneration Authority, describes Kendall Square as "*something of a happy accident of an innovation district. In contrast to Boston's attempts to say, 'We're going to build an innovation district and label it'* (referring to Seaport, see section 4.2.2.1.2), *Kendall has earned that reputation without asking for it. It wasn't the original economic policy goal of the city for the area by any means. It's not easily duplicated. When we give tours to people around the world who say 'So how do we make a Kendall Square happen at home?', our response has to be, well, first you need MIT next door*. *What helps too is that we have the T right here* (the Boston tram system) *which goes straight to downtown Boston, the financial centre for New England, so suddenly you're bringing science and money together as an incredibly rich environment for the biotech world*" (Participant J interview, 9th July 2016).

Figure 4.21: Venture Café event at the CIC, Kendall Square (Source: CIC)

Space is at a premium here and while public space is at a minimum, there are several quasi-public squares, courtyards and greenspaces in and around the Kendall Square area, primarily owned and operated by MIT. Much of the surrounding residential build serves as accommodation for MIT students which, as Participant J2 (an executive from MIT's Property Development Team) describes, '*is designed for optimal individual living within a communal environment*' (Participant J2, 16th July 2016) referring to the emerging trend in its student accommodation to feature markedly compact personal living and sleeping quarters alongside larger, shared spaces for communal study, food preparation and leisure. With the median cost of a single-family home in Cambridge standing at $1.5m in 2017, there is a growing problem with retaining graduate students as they move toward family life and attracting new talent who already have young families to the area (Cambridge Community Foundation, 2017).

The need for an improved mix of housing options including family housing and a marked lack of 'affordable' and social housing, was acknowledged by Participant K in a 2016 interview (Participant K, 16th July 2016), who reported that plans were in place to build mixed-tenure residential property on a former substation site which sits to the north of Kendall Square, (now named the MXD development and in the later stages of the planning application process). In 2017, the Cambridge Regeneration Authority committed to 20% affordable tenure in the development of housing, set at 25% below median market rate, and in 2018 extended it from housing to include commercial spaces. *"There are displacement issues from the housing side, but also from the commercial side*", says Participant K (interview, 16th July 2016). "*Lately, we have been working on how we can densify the area, because we are running out of space. The problem, commercially speaking, is that the Googles and the IBMs can afford much more per square foot then any start-ups or scale-ups".*

Ironically, Participant K2 points to the early days of 'innovation' in Kendall Square as a result of "*space around here being so cheap. The whole area had been cleared out as a service space for NASA, who had a base here for a while, but moved out in the late 60s, so we were left with all this large-scale office and industrial space and it was in plentiful supply, and it was very, very cheap. Once industry had left, and partly it had left because we were getting ready for NASA, it left all these warehouses and big spaces where creatives and innovators could just go and test out robots or rockets or whatever. We offered them space to experiment, and some of those experiments paid off*" (Participant K2 interview, 11th July 2016)

Participant K3, an executive at the Cambridge Regeneration Authority, also notes a reputation for welcoming experimentation and also points to Cambridge being "*the first city in the US to actually write rules about labs into its land use codes. There were protests at City Hall because people thought there would be all sorts of underhand things going on and animal experimentation and immoral practices, but in the end, it went through and it means that if anyone opens a lab here, at least they know the rules. That is – seriously - not the case everywhere*". (Participant K3 interview, 9th July 2016).

Figure 4.22: Kendall Square toward Boston - Aerial Shot 2017 (Source: CRA)

4.2.2.1.2 Seaport

Figure 4.23: Scale Model of the City of Boston - viewed at the Boston Redevelopment Agency, 23rd July 2016 (Source: Author's own)

Boston's Seaport (labelled as 'Boston's Innovation District' by the city's Merino mayoral administration in the mid-1990s) occupies a 1000-acre section of the South Boston waterfront. Originally reclaimed from the sea in the 19th century for shipping and dock warehouses and later used as a naval base until its decommissioning in 1974, the southern section of the waterfront site subsequently proved problematic in terms of development thanks to its inaccessibility from the downtown core. Results of various attempts since the mid-seventies to redevelop the site are still evident with buildings of significantly mixed use, design and tenure, including a market, aquarium, an enterprise centre, rental office-space, a fish processing plant and a cruise ship terminal.

From 1991-2006, the city, via the Boston Redevelopment Agency and working in partnership with local transport agency MassPort, invested $14.6bn in the 'Big Dig', a fifteen-year programme of engineering works designed to better connect the Seaport District to the downtown Boston area, the city's established business district and Logan International Airport by removing the city's 'Central Artery' elevated highway. The scheme resulted in the Rose Fitzgerald Kennedy Greenway, a 17-acre linear park running North to South through the downtown core along with an intricate network of newly constructed underground tunnels. The tunnels are served by a pioneering 'bus rapid transit' hybrid service, which connects directly into the city's subway system and major train stations.

Figure 4.24: The Rose Fitzgerald Kennedy Greenway, Boston, July 2016
(Source: Author's own)

Described as a former "*development wasteland; a no-man's land*" by Participant L (Interview, 23rd July 2016), integration of this formerly isolated and neglected area into the city's transport and business networks, running along a high-profile series of public consultations regarding the planning and zoning of the future site during the 'Big Dig' civic engineering works meant that the district made swift progress in its subsequent re-development, starting with a significant programme of infrastructural and cultural investment, including the opening of the Institute for Contemporary Art in 2006.

Participant L, a senior executive at the Boston Regeneration Authority (BRA), notes that this was not the only difficulty in developing the Seaport as an 'innovation district. "*When we first started masterplanning Seaport, we found out that we weren't allowed research and development labs in the area because of the land use controls that were in place*", adds Participant L (interview, 23rd July 2016). "*We were able to introduce new measures on the back of securing Vertex, but then we found that all the ceiling heights had to be modified in order to meet global standards for labs"* (Participant L, interview 23rd July 2016).

Participant L2, a BRA colleague, describes art and artists as central to the Seaport concept. model and development programme: "*The largest artist community in New England is located here (at the former Boston Wharf Company building). The 'live, work, play' programme for the Seaport is kind of modelled on our arts community. Artists don't necessarily work '9 to 5', they might be up in the middle of the night. They need unique living and working spaces. And there's a lot of networking. They bounce off each other for ideas and inspiration and share materials. And they need amenities. Everything closes in Boston after 1am, so we have made sure we have 24-hour access markets, diners and drugstores*" (Participant L2 interview, 23rd July 2016).

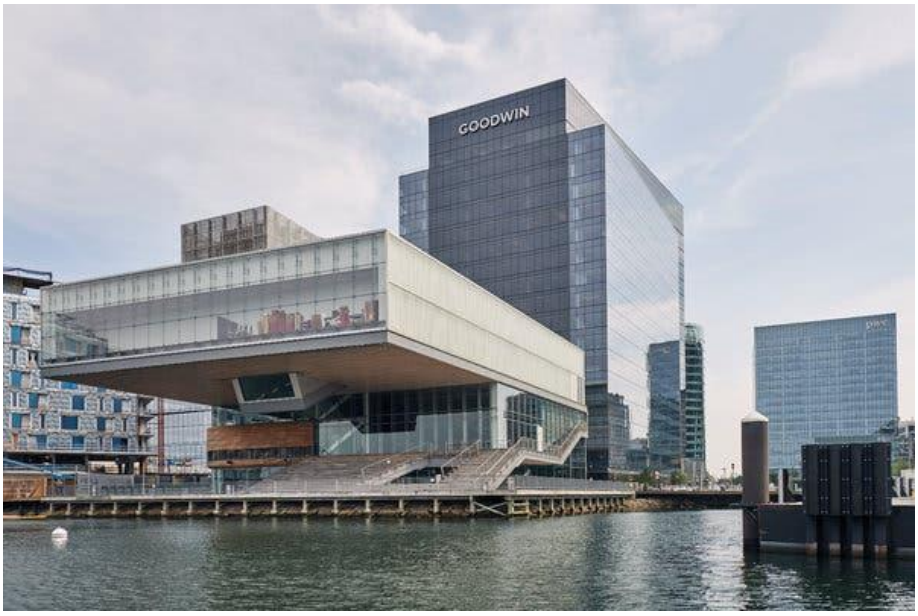

Figure 4.25: Institute for Contemporary Art, Seaport District, Boston
(Source: New York Times)

In 2010, start-up accelerator programme MassChallenge relocated to the area (from the Cambridge Innovation Centre) and in 2011, Vertex Pharmaceuticals became the district's first large-company anchor tenant. Vertex was followed by General Electric and AutoDesk in 2012 and by the opening of the area's civic innovation space, District Hall, in 2013. The District Hall space is a centrepiece in the Seaport Innovation District, offering 12,000 feet of open and publicly accessible space for informal meetings, workspace and events. Profits generated from commercial hire of the space for private events and from its on-site café are reinvested into the Seaport start-up community. As Participant L3 notes, "*The Seaport is the perfect neighbourhood for start-ups because of its density and connectivity and networks"* (Participant L3 interview, 8th July 2016).

Participant L4, a senior executive at the BRA, describes how the initial thinking in terms of housing offer for the Seaport was "*luxury and high-end condos*", but how the masterplan was modified instead to appeal to young people, creatives and the start-up market. "*You might have just graduated and be looking to start-up your own business, and we want you to do it here. But you're broke. You're broke but you're brilliant. We want you to stay here. So, after the crash in 2008, we purpose built 'Factory 63' as a low-rent, shared living facility housing 'micro-units' to accommodate the specific needs of people in that situation. Now, we ask that*

15% of all developments include a co-housing offer at this affordable level" (Participant L4, interview, 14th July 2016).

Figure 4.26: Welcome board at District Hall, July 2016 (Source: Author's own)

Despite the vision and stated intentions of the BRA to develop Seaport as an accessible home for artists and start-ups, the area's extraordinarily high land and property prices mean that the reality is that much of the district is occupied and/or owned by large corporates (see Rissola et al, 2019). In 2019, Amazon was announced as the anchor tenant for a new-build office tower in the district (taking 430,000 sq. ft of space) and in 2020, the company announced that it would also be leasing an additional 630,000 sq. ft space in an existing building (Bloomberg, 2020). In January 2021, it was announced that restaurant and leisure developers Cronin Group had been selected to deliver a $81m refurbishment of a five-storey tower building in the south of the Seaport district. As part of the deal, Cronin Group has agreed to subsidise a free and frequent shuttle bus service between the Seaport District and Nubian Square, Roxbury (Boston Globe, 2021).

4.2.2.1.3 Roxbury

Roxbury is a culturally rich and ethnically diverse district in the south of Boston, which lies five miles (twenty-four kilometres) out of the city-centre. The district has a deep and multi-faceted heritage and history having been home to a significant Irish immigrant population in the late 18th century, a growing Jewish population from the mid-19th century and now widely regarded as the centre of African American culture in Boston and New England.

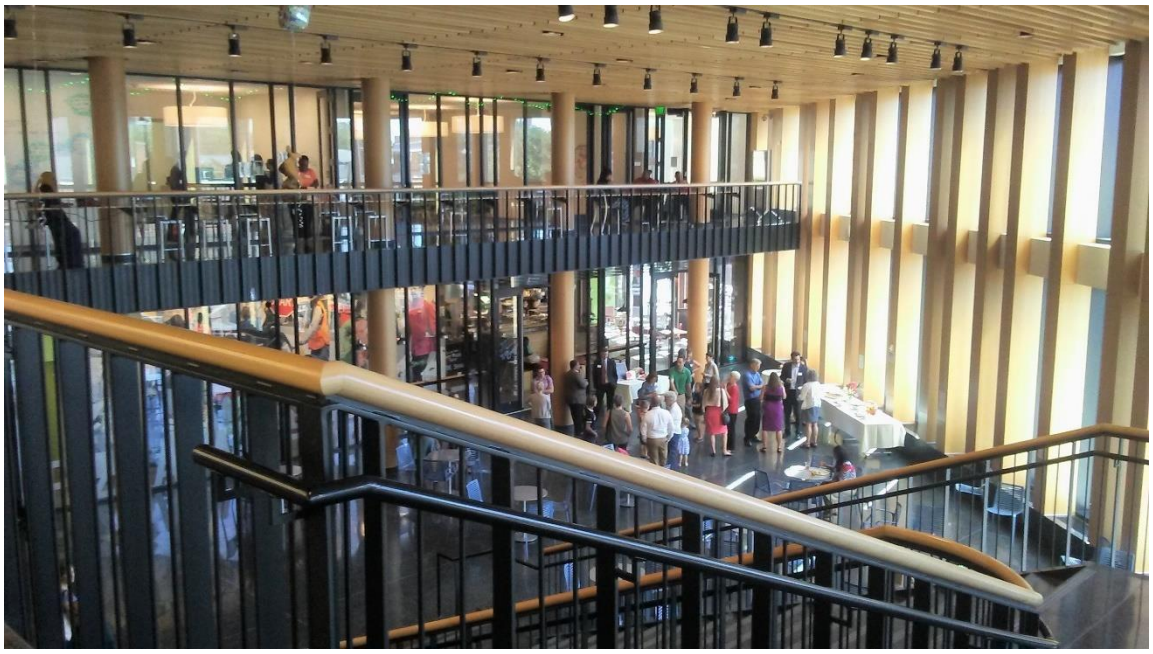

Figure 4.27: The Roxbury Innovation Centre (RIC), July 2016 (Source: Author's own)

The Roxbury Innovation Centre (RIC) was opened in 2015 as a flagship project within the City of Boston's 'Neighbourhood Innovation District' programme (launched by Mayor Walsh in 2014; see Monardo, 2018; Monardo & Massari, 2019). The RIC is hosted at the Bruce C. Boling Building in Nubian Square (formerly Dudley Square), a vibrant and dynamic public square at the heart of the Roxbury neighbourhood. Nubian Square (renamed in 2019) also hosts a major bus terminus for both MBTA local bus routes and Silver Line national routes and for Logan International Airport. The RIC is a non-profit civic innovation centre managed by Innovation Studios (formerly Venture Café New England) and offers 3,350 sq. ft of open access meeting, workspace and event space. On-site facilities include a 'Fab Lab', offering access to and use of cutting-edge digital fabrication equipment. In addition to Innovation Studio's standard programme of meet ups, workshops, Café nights and networking events, the RIC offers start-up accelerator support delivered through the 'Smarter in the City' programme.

'Smarter in the City' offers dedicated mentoring and coaching, strategy, marketing and PR, legal and office-space support for ten locally founded start-ups per year. Participant M describes the RIC as a '*truly open innovation centre where anyone with a good idea can come along and find the support that they need to bring that idea to life'*. (Interview, 26th July 2016). Participant M regards the 'Smarter in the City' support as pivotal in crafting the right approach to meet the needs of innovators and entrepreneurs in Roxbury. *"More often than not, (Venture Café) has to create a community and facilitate connections between people with ideas. Here we have the strongest community and connections in the city, so our resource is better spent on targeted support for individuals*" (Interview, 26th July 2016).

Figure 4.28: 'Learn Lab @', Roxbury Innovation Centre, July 2016
(Source: Author's own)

The Roxbury district, and Nubian Square as its centrepiece, has seen significant cultural and infrastructural investment over the last five years. In 2017, the local public library reopened after a $17.2m renovation programme and, following the closure of 'A Nubian Notion', a large afro-centric retail outlet that had served the Roxbury community for over five decades, local residents Kai and Christopher Grant launched Black Market, a 17,000 sq ft space on Nubian Square hosting a fortnightly pop-up market featuring black led retailers, artists, creatives, makers and independents.

Figure 4.29: Black Market, Nubian Square, Roxbury (Source: Black Market)

In 2018, Roxbury was recognised by the Massachusetts Cultural Council as one of three state Designated Cultural Districts in Boston (along with the Fenway District and the Latin Quarter). In 2019, following a successful campaign to adopt Nubian Square as a new name for Dudley Square, Black Market (supported by the City of Boston Arts and Cultural Fund) launched the Nubian Square Public Arts Initiative. The first commissioned piece was a mural celebrating the Black Lives Matter movement, created by Roxbury-born artist Lee Beard and installed in 2020.

Figure 4.30: Public Art at Nubian Square, Roxbury (Source: Black Market)

There is a large-scale and ongoing programme of public realm development in the area, including streetscaping, new crossings, intersections and bike lanes and significant planned developments for the MBTA bus terminus and nearby Ruggles commuter train station (which also serves as the stop for Boston North Eastern University). There are also a number of private residential and leisure development proposals for the area currently under planning consideration, including a twenty-five-storey tower of mixed use residential, retail and leisure development, named 'The Rio Grande'. If realised, it will be Roxbury's tallest ever building.

Figure 4.31: Rio Grande, Roxbury render – toward Back Bay, Boston
(Source: bostonherald.com)

4.2.3 The Quadruple Helix: Engaging the citizenry in Seattle/King County

Nicknamed 'the Emerald City' thanks to the lush forestation of its mountainous geographical surrounds, Seattle is located on the North West coast of the US. It is the largest city in King County, accounting for just over 747,000 of the county's 2.1m people, making it the 18th largest city in the United States and the city that has experienced the highest population growth in the US between 2014 and 2019 (City of Seattle, 2019). Seattle has a young population, with over 75% of its residents between the ages of 18 and 64, and 23% of residents in the 25-34 years age bracket (City of Seattle, 2019). The city-region is home to four universities, including the prestigious University of Washington.

Figure 4.32: Map of Seattle and King County (Source KingCounty.gov)

Home to the largest Amazon campus in the US, to Starbucks, to Boeing until 2011 and to both the founder of Amazon (Jeff Bezos) and the founders of Microsoft (Bill Gates and Paul Allen), Seattle has topped Forbes' list as the 'Best US City for Business and Careers' for three straight years (Forbes, 2020). Seattle's economy is dominated by professional services, including strong technology and communications sectors, life sciences and healthcare, clean tech and, thanks in no small part to its expansive shoreline and coastal position on the Puget Sound Pacific inlet, port and maritime industries (City of Seattle, 2019). Seattle's port is one of the largest freight-handling ports in the US in terms of volume of container traffic (Forbes, 2020) and maritime accounted for almost 40% of tax revenues for the city in 2019, returning almost $75 million (City of Seattle, 2019).

Figure 4.33: Seattle Harbour, August 2016. (Source: Author's own)

One in nine people in Seattle live in poverty (University of Washington, 2019). Poverty is strongly concentrated in the areas to the immediate south of the city-centre, principally the International District/Chinatown and Rainier Vista districts (University of Washington, 2019). Rents in the city-centre rose by 57% between 2014 and 2020 (City of Seattle, 2020). Homelessness was declared a state of emergency by the then Mayor of Seattle, Ed Murray, in 2016. In 2017, the city ran a lottery programme to offer help with rental and housing costs in response to the crisis, receiving 21,500 applications for a scheme with 3,500 places. Of the 21,500 applications received, more than 35% came from people of colour. African American citizens make up just 6% of Seattle's population, but account for 29% of its citizens experiencing homelessness (City of Seattle, 2019).

4.2.3.1 Seattle/King County Innovation Districts

Seattle's innovation profile is dominated by the South Lake Union area which has seen significant investment since 2000 from Vulcan Real Estate, owned by Microsoft co-founder Paul Allen, and which hosts Amazon's global headquarters, the largest Amazon campus in the US. Katz and Wagner (2014) highlight South Lake Union as an exemplar of the 'revitalised

urban area' typology, describing the "rapid revitalisation" of the area as "one of the most dramatic urban transformations in the United States".

Figure 4.34: Seattle Skyline. (Source: Author's own)

In 2016, Mayor Ed Murray established the Mayor's Office of Policy and Innovation (MoPI) with a specific remit of exploring how the city's innovation strengths could be better applied to its social and economic challenges. The MoPI team works across the city's key strategic portfolios, including health and social care (specifically mental health), housing and homelessness, and skills and education. Since its establishment, MoPI has worked to identify and provide targeted strategic and funding support for areas in the city with 'potential for emergent innovation', establishing a three-year programme of support for the Pioneer Square area in downtown Seattle in 2017. In 2020, the Rainer Valley area was announced as the next area for support, focussing on its identified strengths in food production. Alongside trialling new approaches to strategic development, including citizens' juries and co-production of area plans, MoPI has also piloted new ways to measure and evaluate impact, focussing on qualitative wellbeing metrics.

"*We are not the solutions guys*', explains Participant N, "*Citizens already have the solutions. The role of government is to empower people on the ground so that those solutions, which have been lying dormant, can be brought to life. The same goes for what success looks like, and how you measure it. You have to work with your end user to understand what they value, what life is like for them. Constantly justifying work in a quantitative way doesn't get to the heart of that work. Data driven measurement leaves a lot of tacit knowledge off the table".* (Participant N interview, 10th August 2016)

Participant N describes how in one project working with a group of young men of African American ethnicity, participants were engaged in co-creating metrics for success. The main factor that emerged from the session was 'hope', specifically belief from other people in the young men's ability to vision and realise a positive future. As a result, the primary evaluation question for that programme was 'Is there someone who believes in you?'. '*With that simple question',* says Participant N, *'we're measuring quality of experience, impact on the self and, critically, the relational impact with other people. That's our measure of success".* (Participant N interview, 10th August 2016)

4.2.3.1.1 South Lake Union

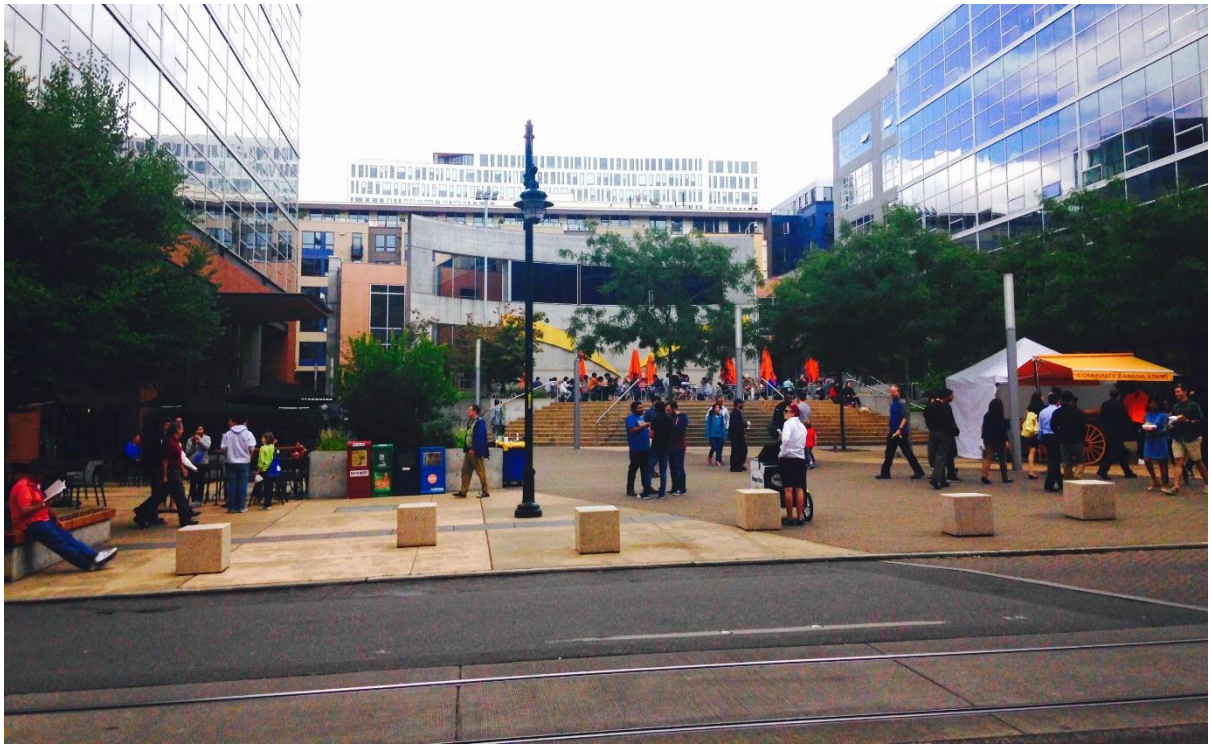

Figure 4.35: South Lake Union Amazon Campus, August 2016 (Source: Author's own)

The South Lake Union area, described by Katz and Wagner (2014) as 'one of the most dramatic urban transformations in the United States' is a former brownfield, post-industrial site which has been developed by private sector investment from Vulcan Real Estate, owned by co-founder of Microsoft, Paul Allen. Despite a public referendum in 1999 which supported development of the area as a public park, the site was sold to Vulcan in 2000 and has since seen the company invest $5.7bn in its redevelopment. The University of Washington's Department of Medicine, which relocated to the area in 2000, has acted as an anchor and catalyst for a globally significant life sciences cluster in the area, which now includes the Allen Institute for Brain Science, Fred Hutchinson Cancer Research Centre, Zymogenetics, Battelle, the Bezos Center for Innovation and the Seattle Biomedical Research Institute.

Figure 4.36: The Bezos Center for Innovation, South Lake Union, Seattle
(Source: Author's own)

Amazon established its global headquarters in the South Lake Union area of the city in 2007, earning the area a local nickname: 'Amazonia'. What started then as an 11-office site employing less than 5,000 people has in just over ten years become a 40-office site employing over 40,000 people. The campus occupies an 8.1 million sq. ft site, with planned construction

to reach a 12 million sq. ft footprint by 2025. Amazon has opened a new office building once every two months in the area, on average, since 2010 (Seattle Times, 2017).

Figure 4.37: The Amazon South Lake Union Campus and Footprint (Source: Seattle Times)

Participant O, an executive working downtown at the King County Mayor's Office for Arts and Culture, describes how, following the arrival of Amazon, "*you could feel a shift in the whole focus of the city. From being a downtown where people commuted in to work, suddenly we were seeing a lot of people commuting out to South Lake".* (Participant O interview, 17th August 2016)

Figure 4.38: South Lake Union boating lake (Source: Author's own)

Neighbouring complexes for both Facebook and Google were announced in 2019 (both over 600,000 sq. ft) and Apple announced in January 2021 that it would be expanding its presence in the area with a second office-space and engineering centre, due to open by 2022. Participant P, a representative of Vulcan Real Estate, attributes the area's continued success to "*dynamic investment in both people and place. We ask each new commercial development partner to allow for a percentage investment in the area's mixed-use retail and residential offer and to make a 0.5 to 1% investment in public realm works, leisure spaces and public art*" (Participant P interview, 25th August 2016). Vulcan's investment in the area includes a number of quasi-public squares, three cinemas (one outdoor), a boating lake and 'cultural complex', which houses four museums, including the 'Museum of Innovation' (part of the Bezos Center for Innovation). Participant Q, a local CIC director, describes South Lake Union as having:

"*…its own uniquely bleached subculture. It's like the Truman Show up there. It's a world away from the cultural grit you get downtown. I can say categorically that I've never walked though Pioneer Square park and experienced someone handing me Haagen Dazs through the bushes. Innovation is not thirty-thousand people burrowed away in their little boxes thinking how to*

make online purchasing easier and place-making is not a group of guys sitting around and thinking 'Hey, how do we make a place?' Oh, I know – ice cream. Placemaking is about coming together as people to think about what our place needs from us and what we need from it. Innovation is answering those questions with creativity" (Participant Q interview, 1st September 2016).

Figure 4.39: South Lake Union, Seattle, August 2016

(Source: Author's own)

4.2.3.1.2 Pioneer Square

Seattle's Pioneer Square, 'the original heart of the city', is an important, iconic area in terms of the city's culture, heritage and arts scene, and, following a targeted programme of city support, has since 2016 become a widely acknowledged as the city's focal point for tech start-ups and grassroots innovation. Participant R describes the role of the several co-working, accelerator and support spaces emerging in the area as "*a catalytic convenor between the place and the people*" and "*the City with a big C's role*" as "*empowering people on the ground so*

that those solutions that citizens already have, which have been lying dormant, can be brought to life" (Participant R interview, 4th September 2016).

Figure 4.40: Occidental Square, the Pioneer Square district, Seattle, September 2016 (Source: Author's own)

The Pioneer Square area is acknowledged as an area of stark contrasts. Alongside its numerous co-working spaces, art galleries, independent retailers and cafes, it also includes the city's highest concentration of homelessness shelters, mental health facilities and city missions. The Alliance for Pioneer Square, which formed in August 2015 as a campaign to support development of the public square at the centre of the district (and which has since led development of the square as a successful multi-use civic space), acts as a collaborative platform through which public, private, third sector and civic stakeholders come together to generate and action solutions to the area's challenges.

"*Our work with the square as a physical space scans straight across to our current collaborative community work,"* says Participant R*, "At the core of it is connecting people. Whether you're talking physical space, community space or economic space, the most important things are firstly that everyone is welcome, secondly, that there's equality of access, based on empathy with other people's needs – to which point, when we co-developed the square, we took city planners on a tour in wheelchairs; and thirdly, that everyone is equally*

valued in the space. Everyone is welcome here, but don't devalue other people" (Participant R interview, 4th September 2016).

Figure 4.41: Union Gospel City Mission Homelessness Shelter, Pioneer Square, Seattle (Source: Author's own)

Across 2015/6, the Alliance for Pioneer Square, working with key local stakeholders including Seattle Impact Hall, the Pioneer Square Business Improvement District (BID) and the Seattle Design Festival, initiated the 'Mapping the Square' project. Based at local arts organisation A-Gallery and working through temporary pop-up kiosks located around Occidental Square (the main square at the centre of the Pioneer Square district), the project garnered public opinion on development options for the square's facilities, public realm and built environment, using a system of coloured tags to represent options. The results were integrated into a co-created strategic planning document for the square ('Your Pioneer Square', 2016-20), formally adopted by the City of Seattle in April, 2016.

Figure 4.42: The Pioneer Collective Co-working space, Pioneer Square, Seattle (Source: Author's own)

The area has since seen significant public funding in its public realm and infrastructure and vast levels of private sector investment over the last five years. Global tech companies including HTC and Intel have relocated their US headquarters to the area and in 2017, leading forestry and timber giant Weyerhaeuser announced it would be locating its global headquarters to Occidental Square, realising a 200,000 sq. ft new-build office facility in 2018 on the site of a former car park. At the same time, the area's tech start-up ecosystem has boomed. Pioneer Square Labs, which was founded as a start-up studio space in the area in 2015 has since secured over $27.5 million investment in its validation and accelerator platform and raised over $80 million for its start-up venture capital fund, spinning out 25 new companies (Geekwire, 2021).

Figure 4.43: Impact Hub Global Conference at Impact Hub Seattle, August 2016 (Source: Author's own)

4.2.4 Innovation from the Grassroots: The Liverpool City-Region

Liverpool is a city of 489,000 people (ONS, 2018) located on the Northwest coast of England. Globally renowned for its links to music, sport and culture, principally through The Beatles, Liverpool and Everton football clubs and its status as a former European Capital of Culture (2008), the city has a strong cultural footprint and a unique cultural identity and linguistic dialect known colloquially as 'Scouse'. The wider Liverpool City-region, which includes the neighbouring boroughs of Wirral, Sefton, Knowsley, St. Helens and Halton, has a population of approximately 1.5million people (LCR, 2019).

Figure 4.44: Liverpool's position on the Northwest coast of England

Liverpool has a markedly young population, with over 75% of people being in the 18-24 age range (LCR, 2019). The Liverpool city centre population doubled between the years 2006 and 2016, and the Liverpool City-region had the highest population growth of any Combined Authority area in England over 2017/8, a 3.3% growth, compared to England's overall growth rate of 2.0% (LCR, 2019). In practice, and as noted in a 2011 scoping report by Lord Heseltine the city of Liverpool acts as the metropolitan centre for a much wider footprint and is at the centre of "an urban region that spreads from Wrexham and Flintshire to Chester, Warrington, West Lancashire and across to Southport" (UK Government, 2011), representing an extended population of almost 2.3m (LCR, 2019).

Figure 4.45: Map of the Liverpool City-Region (Source: LCR Metro Mayor)

Historically, Liverpool is a city whose economic fortunes have risen and fell, primarily in line with the (literal and figurative) tides of its port and maritime industries. The city's port was at the centre of the cotton trade in the late eighteenth and early nineteenth century. Much of its shipping wealth and built heritage has historical links to colonialism and to the slave trade. Moving into the 20th century, the port remained a significant economic, social and cultural driver throughout the 1900s until the 1950s when a decline in manufacturing and post-war trade slump led to an increasing decline in port business, culminating in the de-industrialisation policies of the UK's Thatcher Government from 1979 onward. The policy sparked a crippling economic downturn for the city, marked by riots, strikes and a peak unemployment rate of 20% (Belchem, 2006), at which point Prime Minister Thatcher's home secretary Lord Howe suggested that the Government adopt a policy of 'managed decline' for the city (Belchem, 2006). Despite a significant upturn in the city's economic fortunes from the mid-1990s onwards, supported by £1.6 billion of EU Objective One funding from 1994 to 2007 and including the £920 million redevelopment of its central shopping district (as 'Liverpool One') from 2004-8, with a particular renaissance in its cultural and tourism sectors marked by its UNESCO World Heritage Site award in 2004, its tenure as European Capital of Culture 2008

and its UNESCO City of Music Award in 2015, there remains stark and significant levels of poverty and inequality across the city and the wider city-region.

Figure 4.46: The Liverpool waterfront and River Mersey (Source: Author's own)

Liverpool is the 4th most economically deprived local authority area in England (IMD, 2019). 49% (145 out of 298) of districts across Liverpool are in the most deprived 10% in England. 31 of those districts are in the most deprived 1% nationally and one – Anfield – is in the top 10 most deprived districts in the country (IMD, 2019). There are seven times as many job seekers in Liverpool as jobs currently available (LCR Child Poverty Strategy, 2020). An average of one in three children in Liverpool lives in poverty, and it is as high as two in three in some areas (LCR Child Poverty Strategy, 2020). An average of 18.6% of households in Liverpool are 'workless', compared with a Great Britain average of 13.9% (ONS, 2019), and 9.8% of adults in the Liverpool City-region have no formal qualifications (ONS, 2019).

Although the Port of Liverpool remains one of the busiest ports in Europe (LCR. 2019), in 2020 'Maritime and Logistics' was dropped as a key focal sector for the first time since a sectoral focus was for the city-region was developed (as part of the Objective One programme) in 2002. Liverpool City Region LEP's 2020 refresh of key sectors has instead shifted the focus to Clean Growth, Advanced Manufacturing, Built Environment, Health & Life Sciences, Professional & Business Service, Visitor Economy and – stated as a sector in its own right – Innovation (LCR LEP, 2020). An audit of the city-region's science and innovation assets – the Science and Innovation Audit (SIA) – was undertaken in 2017, backed by BEIS (the UK Government Department for Business, Energy and Industrial Strategy) and delivered as part of the Liverpool City-region's devolution deal which saw Mayor Steve Rotheram elected in 2017.

The audit revealed strengths in three areas: Infection, Materials Chemistry, and High-Performance & Cognitive Computing, supported by the Liverpool School of Tropical Medicine's Centre of Excellence for Infectious Disease Research (CEIDR), the Materials Innovation Factory (an £18m facility sponsored by Unilever), both of which are based in the University of Liverpool's 'Knowledge Quarter', and the Hartree Deep Change project (for HP&CC), based at SciTech, Daresbury. The audit describes these three thematic areas as 'smart specialisms', and states what it calls "a 4th ambition: For the LCR to be a national exemplar of place-based and innovation-driven economic growth that supports the UK Industrial Strategy" (LCR SIA, 2017).

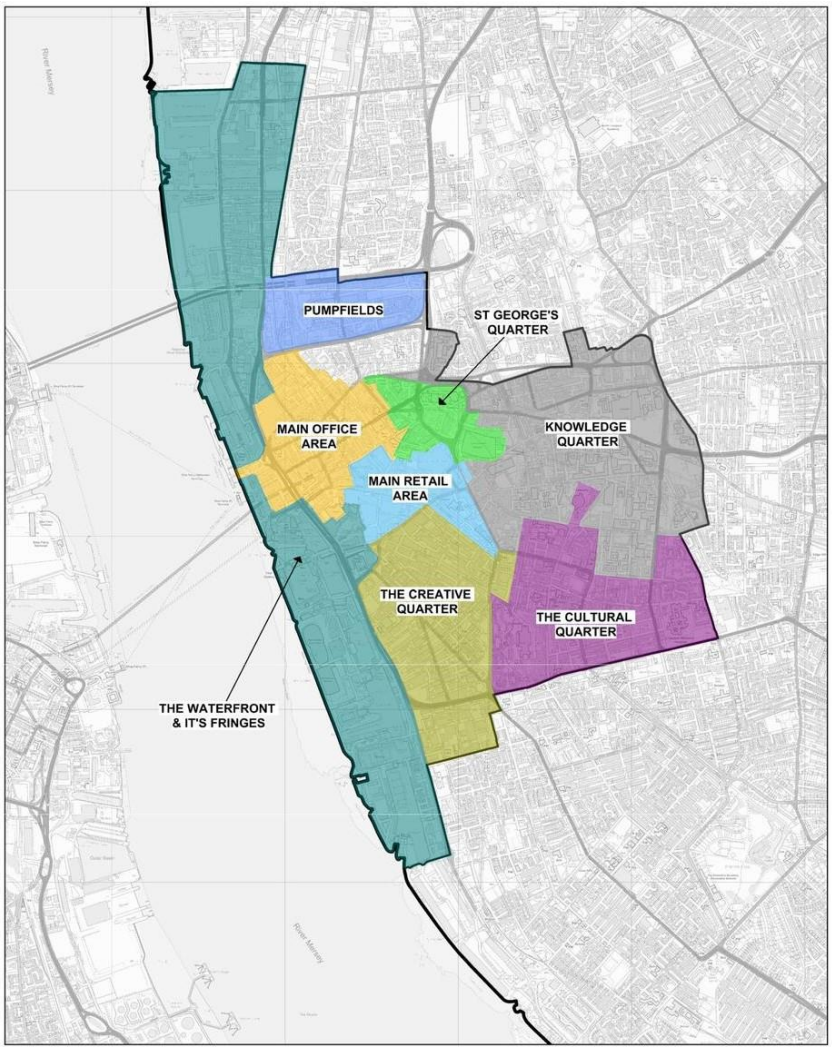

Figure 4.47: Liverpool City Centre Masterplan Zoning (Source: LCC)

Alongside these commercially and academically 'anchored' innovation districts, which correlate with the 'anchor plus' innovation district identified by Katz and Wagner (2014) and which are presented in this case study as examples of 'place-based' innovation, two further

levels of the emerging place taxonomy identified through the research (and presented in Section 4.5) are evident in Liverpool. There is a 'place-grounded' expression of innovation, correlating with the 'Reimagined Urban Areas' typology of innovation district identified by Katz and Wagner (2014) characterised by a spatial reimagination (often supported by public sector investment) and strong third sector and social enterprise presence, manifest in Liverpool in areas such as the Baltic Triangle, The Fabric District and the 'Ten Streets' area. There is also a rapidly emergent, and even more so in the wake of the COVID-19 pandemic, model of innovation which correlates with the proposed 'fourth level' of innovation in the new place taxonomy, driven by collectives of people and communities of place, and explored in this case study as 'place-driven' innovation, using examples from the districts of Kensington/Wavertree (the Holt Road CICs and Love Wavertree CIC), Toxteth/Granby (Granby 4 Streets Community Land Trust, Kuumba Imani Centre and L8 Better Place) and Anfield (Homebaked CIC and Community Land Trust).

4.2.4.1 Liverpool City-region Innovation Districts

4.2.4.1.1 Sci-Tech Daresbury

Sci-Tech Daresbury is a National Science and Innovation Campus which sits within the Halton borough of the Liverpool City-region, at a well-connected motorway intersection between the regional metropolitan centres of Liverpool and Manchester. Established in 2006, the campus was recognised as a national enterprise zone in 2012. Sci-Tech's development has been led by a public/private joint venture partnership consisting of the national Science and Technology Facilities Council (STFC), Halton Borough Council and private developer Langtree. The campus is home to The Cockcroft Institute, an international centre for Accelerator Science and Technology (AST) co-hosted by the universities of Liverpool, Lancaster and Manchester, and the Hartree Centre, a leading industrial research and development centre for big data systems and data-intensive sciences, which houses the most powerful supercomputer in the UK. The Hartree Centre is also home to IBM Research and its £200m 'Watson' cognitive computing platform, through which it is leading work with Liverpool's Alder Hey Children's Hospital to implement smart technologies within its site as the UK's first 'living hospital'. In addition to IBM, Sci-Tech Daresbury houses research centres for global corporates and companies including Unilever, Bentley Motors, BAe Systems, Atos and Livful Biotech. One in six of the larger corporates at the campus are head-quartered outside of the UK and cite Sci-Tech

Daresbury as their UK base (Sci-Tech Daresbury, 2020). Participant C1, a senior executive at Sci-Tech, reports that the site has "*seen a significant uplift in enquiries post-Brexit from international businesses looking to secure a UK base. We offer them a ready-made platform for collaboration and partnership which means they can land and go. We have US businesses based with us who tell us that what we are doing here is like Silicon Valley, but better".* (Zoom interview, 2nd October 2020).

Sci-Tech Daresbury operates as an 'open innovation' centre, in that alongside major multi-national corporates and large-scale companies, the campus is also home to 150 SMEs, microbusinesses and start-ups who specialise in advanced engineering and digital, biomedical, energy and environmental technologies, with over 1,300 people employed in the office, laboratory and technical space offered on site. In 2020, £8.4m funding was secured from the Liverpool City-region LEP to support 'Project Violet', a 42,000 sq. ft expansion of the site to create a facility of 'mixed use' space aimed at smaller businesses (Sci-Tech Daresbury, 2020). "*Our aim is to create a world-class shared space that can accommodate for all the office, lab and tech needs of small and microbusinesses, cutting costs for the businesses and encouraging new and productive partnerships and collaborations"* (Participant C1, Zoom interview, 2nd October 2020).

4.2.4.1.2 Knowledge Quarter Liverpool

Driven by the Knowledge Quarter Liverpool Development Company (KQ Liverpool), a special-purpose vehicle set up in 2018 and bringing together partners from Liverpool City Council, the University of Liverpool and Liverpool John Moores University (LJMU), the Knowledge Quarter refers to a strategically designated area which sits to the immediate east of Liverpool City-centre. The Knowledge Quarter area houses a number of the city's key knowledge-based institutions and assets alongside several of its iconic civic, religious and cultural spaces. These include (but is not limited to) the Royal Liverpool University Hospital, the Liverpool School of Tropical Medicine (LSTM), the Liverpool Institute of Performing Arts (LIPA), The LJMU Art and Design Academy, Liverpool Cathedral, Liverpool Metropolitan Cathedral, the Liverpool Philharmonic Hall, the World Museum and Liverpool Central Library. Since the early 2000s, the area has seen significant investment and re-development, including the £451m new-build Royal Liverpool University Hospital (still in progress, and delayed following the collapse of development company Carillion), and a large-scale transformation and pedestrianisation of the area around Lime Street Station as the key transport node for the

area (and the city). The Knowledge Quarter generates £1bn in income per year, 15% of the city's GVA, supports 14,000 full-time jobs and hosts over 60,000 students (KQ Liverpool, 2018).

KQ Liverpool has a three-tiered strategic vision for the area: Making the Place, Improving Connectivity and Attracting Investment (KQ Liverpool, 2018). Site specific assets and developments include Liverpool Science Park, a grade-A office and co-working facility housing over sixty STEM (Science, Technology, Engineering and Maths) SMEs, start-ups and microbusinesses, Sensor City, a dedicated research centre and lab space for sensor research and the 'Internet of Things' (IoT) and the £1bn expansion of the Paddington Village site to over 30 acres, envisaged as an 'eastern gateway' to the Knowledge Quarter and a hub for healthcare technologies. "*We want to offer our community partners world-class space for world-class R&D facilities with the distinctive culture and community feel that you get in the likes of Greenwich Village"* says Participant D1(Zoom interview, 10th October 2020).

Figure 4.48: 'The Spine' building and Knowledge Quarter, Liverpool
(Source: KQ Liverpool)

'The Spine' is the flagship development in Paddington Village, a 14-storey BREEAM Excellent rated building with a biophilic curtain wall system and ceramic frit façade. The façade incorporates 23 million unique voronoi polygons that mimic human skin, wrapping around the building and reacting to the light and sound of the local environment to reduce glare and noise. The Spine's 16,000 sq. ft of office space will house the Northern Centre of Excellence of the Royal Society of Physicians, neighboured by the £35m Rutherford Cancer Centre, which will include a UK-leading proton beam therapy cancer treatment facility. The Knowledge Quarter is also home to Accelerator, a £25m collaboration between the Royal Liverpool and Broadgreen University Hospital Trust and the Liverpool School of Tropical

Medicine which houses 30,000 sq. ft of laboratory space, insectaries and shared working space, the £81m Materials Innovation Factory (MIF), a 12,000 sq. ft lab space focussed on materials functionality at the atomic scale and driven by a public/private partnership between the University of Liverpool, Unilever and the UKRI (UK Research and Innovation).

4.2.4.1.3 Liverpool Innovation Park/ Wavertree Technology Park

Two miles further east of the Knowledge Quarter, the Liverpool Innovation Park borders Edge Lane, the main arterial route linking Liverpool City-Centre to the M62 motorway and national road network. Launched in 2003, the Innovation Park comprises of 300,000 sq. ft campus offering mixed-use office space (Liverpool Innovation Park, 2020). Its largest building and feature space is Baird House, a 200,000 sq. ft building which formerly housed the UK headquarters of global telecommunications Marconi (until Marconi's collapse and wholesale acquisition by Ericsson in 2006). The Innovation Park is home to over forty start-ups and SMEs working in digital technology and data sciences, with a noted specialism in e-health. The University of Liverpool-led spin-off company AIMES and its ultra-secure data storage facility (which serves as a data storage centre for confidential health records) is based on site and Baird House is anchored by the assured tenancy covenants of the Liverpool Community NHS Trust and Merseycare NHS Trust. The Innovation Park was also home to Liverpool John Moores University's International Centre for Digital Content (ICDC) from 2003-2012, a flagship tenant for the site.

The Innovation Park neighbours Edge Lane Retail Park to the east, which was re-developed as Liverpool's largest shopping park in 2017 (Liverpool City Council SRF, 2017) and Wavertree Technology Park to the south, an industrial park which was established in the 1990s and hosts large-scale 'pavilion style' office units, primarily for call centres, telecommunications companies and telemarketing services. Barclays Bank and The Royal Bank of Scotland have long-established call centre operations on the Technology Park. Following its takeover of Liverpool games development company Psygnosis, the site became home to the UK headquarters of Sony Computer Entertainment in 1995, until Sony closed the site in 2012. The Technology Park saw a 'boom' in the 2000s, in line with the launch of the ICDC centre at the Innovation Park in 2003, and was home to a number of locally founded, 'up and coming' digital and tech start-ups and SMEs such as Mando Group (now located in the City Centre).

The Innovation Park also neighbours the former Littlewoods Pools building, an art-deco structure which was completed in 1938. The building has stood empty since 2003 but is currently the subject of a large-scale development led by developers Capital and Centric which will see it transformed into a film and TV studio complex. Anchor tenants confirmed for the site include Twickenham Studios, Liverpool Film Office and Liverpool John Moores University's Screen School (ran in partnership with Hugh Baird College). The remaining site campus will accommodate offices and co-working space for start-ups and SMEs in the film and television sectors, a public events space and a 150-seat screening room.

Figure 4.49: Littlewoods Film Studios render (Source: Capital and Centric)

4.2.4.2 Creating Places for Innovation

4.2.4.2.1 The Baltic Triangle

Figure 4.50: The Baltic Triangle, Liverpool (Source: Baltic Triangle CIC)

Designated as Liverpool's Creative and Digital Quarter in the city's 2017 Spatial Regeneration Framework (Liverpool City Council, 2017), The Baltic Triangle lies on the hinterland of the River Mersey, bordered by Liverpool city-centre to the North, Wapping and Queens Docks to the West and the Dingle/L8 district of Liverpool to the immediate south. The area has a rich maritime and industrial heritage, drawing its name from historical trade links to the Baltic countries (evidence of which survives in a number of the area's numerous 18th and 19th century warehouses and listed buildings, including the Baltic Fleet pub, Heaps Rice Mill, Greenland Street warehouse and the Swedish Seaman's Church, which are all Grade 2 listed). The area was bombed heavily during the Second World War, leaving widespread dereliction and malaise over the three decades which followed. By the 1980s the area, and particularly its main thoroughfare Jamaica Street, had become recognised as the City's 'red light district' (an area of concentrated prostitution).

From 2005 onward, and especially in the run up to Liverpool's tenure as European Capital of Culture 2008, the area developed a reputation among artists and creatives as offering affordable and abundant space in close proximity to the city centre. This interest was catalysed further with the launch of arts venue A Foundation, followed by Elevator creative and music studios, both in 2006. Early pioneers into the area, including Elevator and A Foundation, formed Baltic Creative CIC (Community Interest Company) in 2009. The CIC was supported by Liverpool City Council to take long term leases on eighteen former warehouses and industrial premises across the four main blocks at the centre of the Baltic Triangle area. Baltic Creative CIC is

committed exclusively to the creative and digital industries and since its launch has overseen the redevelopment of the buildings and premises in its ownership as offices, studio units and co-working spaces which have been rented out to digital and creative SMEs, social enterprises and start-ups. In addition to its first and signature space which was developed as 'Baltic Creative', a large industrial unit which houses a number of sheds within its walls as independent workspaces, the CIC has developed the Norfolk Street Digital Tech Hub, the 'Northern Lights' artists and creative industries hub, 12 Jordan Street, which provides large-scale maker space, 'The Studio', a creative and digital accredited training facility for young people aged 14-19 and 'Hub Squared', a mixed-use development housing co-working spaces and micro-apartments.

Between 2017 and 2020, Baltic Creative CIC tripled the footprint of properties in its ownership to 120,000sqft. Tenant businesses contribute £16.6m in GVA to the city's economy, £7m of which is current asset value in ownership of the CIC (Baltic Creative, 2020). Participant E1, a CIC Director says that "*The Baltic difference is that the space has been created by people with purpose not property developers and the built assets are owned by the community, for the community, in perpetuity. We reinvest circa £500,000 a year back into the area and into our community's local, irrepressible, creative exuberance".* One aspect of the Baltic's business model which Participant E1 notes as "*game-changing*" has been the CIC's commitment to a gender balanced representation on its board of Directors. "*We have fiercely maintained a 50% female board from the outset and the collaborative style that this has supported has been critical to the areas collective success",* says Participant E1, adding that *"33% of our tech ventures are led by women compared to a 22% sector average*". (Zoom interview, 16th October 2020)

4.2.4.2.2 Ten Streets

Figure 4.51: The ‘Ten Streets’ area (delineated in red) (Source: Liverpool City Council)

The ‘Ten Streets’ project focusses on an area of ten streets which sits to the immediate north of Liverpool city-centre and which, like the Baltic Triangle district, occupies a historic former dockland. Like the Baltic Triangle, the ‘Ten Streets’ area displays a built fabric which is steeped in maritime and industrial history and which includes a number of heritage dock buildings and warehouses, notably the Grade 2 listed Stanley Dock and various warehouses along Great Howard Street, colloquially known as ‘The Dock Road’. Unlike the Baltic Triangle, the area is still home to a number of active manufacturing firms, steelworks, haulage and heavy industry. Liverpool City Council designated the Ten Streets area as a ‘Cultural Enterprise and Industry Hub’ in its 2018 Spatial Regeneration Framework review (Liverpool Council SRF, 2018) and has undertaken a £110m in a programme of infrastructure improvements in the area, including The North Liverpool Key Corridor scheme which has seen cycling lanes installed along the main arterial route to the north from the city centre (along “The Dock Road”) and the installation of a ‘City Bike’ bike hire station outside the Titanic Hotel. Participant F1, a company Director with interests in both the Baltic and Ten Streets areas, explains how the Ten Streets area differs to the Baltic Triangle in both the availability of large-scale space and in its industrial focus: “*The Baltic Triangle is home to one of the fastest-growing digital and creative clusters in the country. Ten Streets is about making and craft and skilled work. The key*

difference between this area and others in the city is the sheer scale of space that's available. This is the kind of space that makers need". (Zoom interview, 6th November 2020).

Figure 4.52: Ten Streets Market, Liverpool (Source: Ten Streets Market)

Since its official designation as a priority investment district for the Council in 2018, the area has become home to a number of events, concerts and entertainment spaces, including The Invisible Wind Factory and Sound City. Early tenants in the area include the Ten Streets Market, a market space housed in a former industrial warehouse and selling locally made artisan crafts, artworks and furniture, creative studios including Pirate Music Studios and Vessel Film and Photography Studios and co-working spaces including Make Liverpool CIC and We are Nova, both of whom have expanded into the area from their original homes in the Baltic Triangle. "*The area is very urban and industrial*", says Participant G1. "*It's still a working area as well as being creative so there's a nice energy. Some of the pubs and cafes are quite old school and there's industrial businesses who have been here for years. There's businesses making canal boats and wooden pallets, but then there's also a wave of new creative businesses who are starting to pop up and are mixing in with the manufacturing industry that's always been here*" (Zoom interview, 24th October 2020).

The Ten Streets project sits between the site of the £5.5bn Liverpool Waters Scheme, led by large-scale landowners and developers Peel Holdings Ltd and Stanley Dock, home to the 5-star Titanic Hotel and the Tobacco Warehouse, a £130m development of high-spec residential apartments (Liverpool City Council SRF, 2019). In early 2021, planning was approved for Everton Football Club's new stadium at Bramley Moore Dock, which sits at the river-side end of the 'Ten Streets'. A number of related planning applications are also under consideration related to the stadium and provision for sports tourism, including three new hotels.

4.2.4.2.3 The Fabric District

The Fabric District centres on a linear area of land bordering New Islington, a main multi-carriage access route connecting Liverpool city-centre to the national motorway network. Islington, stretching east out of the city-centre and toward the districts of Everton and Kensington, touches on the Knowledge Quarter and the roads surrounding the Royal Liverpool University Hospital. Historically, the area was recognised as the centre of the city's textiles and 'rag trade', a spin-off industry emerging in the late 18th and early 19th centuries from the Port of Liverpool's relationship with the Lancashire textile mills at the boom of the cotton trade. Those traditions have continued, and a number of long-standing fabrics and textiles businesses, many 'family owned', still operate in the area, notably Abakhan fabric haberdashery and sewing supplies, Try and Lilly hatmakers and Thelma Madine, a dressmaker's studio made famous by the Channel 4 television show 'My Big Fat Gypsy Wedding'.

Figure 4.53: The Tapestry building & Arts Festival, 2019 (Source: The Fabric District)

A Community Interest Company (Fabric District CIC) was established in 2018 to represent the area's interests and to oversee its planning and development, with a Board of Directors that consists of local property and business owners, academic partners, local artists, housing associations and private sector developers. The flagship space in the district is 'The Tapestry' a privately-owned 25,000 sq. ft building which hosts dance studio MD Productions, the DoES Liverpool co-working and maker space, Melodic Distraction, an independent internet radio station and Parr Street recording studios, alongside a large multi-purpose events space and 'The Fashion Hub' incubator, featuring fifty workshop and studio spaces for independent makers and fashion businesses (The Fabric District CIC, 2020). Participant H1, a Director with the CIC, says "*The district has such a rich history and has been at the heart of the city's textile*

trade for centuries. This is where scousers come to get their wedding dress made, to get fabrics to do their new home up and to get themselves a new hat made for Aintree. It couldn't be better in terms of location, you're near Lime Street, the universities, the Knowledge Quarter and with all that investment so close by, it's an area ripe for resurgence." (Zoom interview, 11th November 2020)

Figure 4.54: London Road, Liverpool & TJ Hughes buildings (Source: Liverpool Echo)

The Fabric District is bordered to the South by London Road, another main thoroughfare into the city-centre which has gained notoriety in recent years as an area of marked dereliction and decline, street crime, anti-social behaviour and street-drinking. Running adjacent to the city's main train station, Lime Street Station, London Road is home to a number of hostels and to centres catering for people experiencing homelessness and addiction issues. Once a famed shopping street, London Road's retail offer was anchored by TJ Hughes, a well-known discount department store which opened its flagship store in the city in 1925. Although the main TJ Hughes store remains in operation, planning has been granted for an ancillary building (which was added as an extension to the main TJ Hughes building in the 1960s) to be demolished and replaced with a mixed-use development featuring residential units on the upper floors and independent retail units at ground level. Participant H1 says "*It is great to see there is an active retail frontage planned for the former TJ Hughes annexe. London Road could become a high*

street again with independent shops, cafes and restaurants. We want the streets to be animated and to have some nice streetscaping, prominent signage and greening". (Zoom interview, 11th November 2020).

Figure 4.55: The Fabric Village render. Source: Fabric District CIC

Developments in progress in the district include 'The Fabric Village' number of student housing developments and a £50m three-block housing complex aimed at 'young professionals', which will realise a mix of one and two-bed apartments. The Fabric District visioning document and development plan includes a 'colour palette' advisory guide for developments which recommends a muted, 'urban' colour scheme and exposed brickwork which, says Participant H1 "*favours an industrial feel. We want to avoid everything getting covered in brightly coloured cladding*." (Zoom interview, 11th November 2020). The area has hosted a number of arts festivals since 2018 including the Contrast Mural festival and, in the second UK national COVID-19 pandemic lockdown, during which a number of the city's arts and cultural spaces were required to close, exhibited artworks from local artist John Hyatt on the exterior walls of buildings around the district as an 'outdoor gallery space'.

4.2.4.3 Community-led Innovation

4.2.4.3.1 Kensington, Picton and Wavertree

The Kensington area of Liverpool sits at the eastern end of the New Islington dual-carriageway and the Fabric District, and immediately adjacent to the Knowledge Quarter (Section 4.10.1.2). The Royal Liverpool University Hospital building sits at the city-end of Kensington, the main thoroughfare which runs through the district and which shares its name. Thanks to its proximity to the Knowledge Quarter and to the city's main university campuses, the Kensington area is a popular residential choice for students, offering lower rents and costs of living than city-centre accommodation. The Kensington area is one of the most economically deprived areas in the country. 98.2% of Kensington's residents (approximately 14,000 people) are amongst the top 5% most economically deprived in England and 39% of its children live in poverty (IMD, 2019). 33% of the area's population have a registered long-term health condition or disability, and life expectancy at birth is 70.6 for males and 73.8 for females (IMD, 2019). Sheil Road, a main road bordering the district's main green space Newsham Park, has become an area marked by concentrated levels of prostitution and the recognised 'red light district' in the city (following the gentrification of Jamaica Street and the Baltic Triangle, as described in Section 4.10.2.1). There are high levels of street crime and anti-social behaviour in the area (Merseyside Police, 2020). Of 1281 incidents of crime in the Kensington and Fairfield district recorded by Merseyside Police in 2020, 354 were incidences of violent crime. The area exhibits a marked deterioration and decay in its physical fabric, with a number of vacant and derelict units along the main Kensington thoroughfare and a high proportion of its Victorian terraces now converted to houses of multiple occupation and 'student lets' (Liverpool Echo, 2017).

Moving eastward, the Kensington district neighbours Picton ward, where 2019 figures show 49.9% of children living in poverty (IMD, 2019) and where an estimated 80% of terraced housing has been converted into houses of multiple occupation, primarily as student accommodation (Liverpool Echo, 2020). Picton Road, the district's main thoroughfare becomes Wavertree High Street at the junction with Rathbone Road, marking the start of the Wavertree ward area. Although the Wavertree ward exhibits similar top-line deprivation levels to Kensington and Picton, with the local 'Imagine If' food bank serving over 10,000 local residents in the 2019/20 year (Imagine If, 2020), the district includes pockets of marked wealth (notably Sandown Road and Wavertree Garden Suburb) and as such performs marginally better in statistical averages. All three districts border the Liverpool Innovation Park, and the Wavertree ward is home to Wavertree Technology Park (see section 4.10.1.3).

Figure 4.56: Aerial shot of HMR demolition in Kensington, Liverpool, 2002
(Source: Kensington NDC)

The Kensington area was a focal point for both the New Deal for Communities programme (launched in 1998) and the Housing Market Renewal (HMR) Pathfinder initiative (launched in 2002), two nation-wide flagship 'regeneration' schemes delivered under the auspices of the Blair government (1996-2007). A combined £92m was invested in the Kensington area through these schemes over a period of ten years (Kensington NDC, 2010). The HMR Pathfinder programme focussed primarily on demolition of Victorian housing stock, for planned replacement with a new-build mix of private sector and social tenure housing. The HMR Kensington Pathfinder programme was the largest in England and the Edge Lane Project at its centre, a £20m scheme which sought to demolish housing in order to widen the Edge Lane roadway, became subject to a number of legal challenges from residents and community groups, resulting in 2006 in a successful High Court challenge to quash the compulsory purchase order issued by Liverpool City Council. The High Court's decision was later revoked in 2008 and the Edge Lane Project later went ahead as planned (Kensington NDC, 2010).

Figure 4.57: Holt Road Kensington, Community-owned CICs (Source: Google Maps)

Despite these large-scale attempts at government intervention, the district's socio-economic challenges and what Participant I1 calls "*the bad teeth*" (Zoom interview, 20th November 2020) in its physical fabric persist. In 2014, members of the Kensington Community, many of whom had previously been active in campaigns relating to the HMR Pathfinder and Edge Lane Project, founded a community radio station, LCR Community Radio. Members of the LCR Community Radio project negotiated a peppercorn rent with a local landlord to secure a property on Holt Road, which runs off the main Kensington thoroughfare, as a home for the project, launching as a CIC in 2016. The community group extended its operations to the adjoining property in 2017, opening the Kensington Bread Company as a bakery and CIC, and again in 2018 to launch On Yer Bike CIC, a community-owned bike shop and repairs centre. The latest additions to the portfolio are the Nexus community hub space for skills development and learning, launched in 2020, and The Croissant of Equality, launched as a café in 2020 and incorporated as a CIC in 2021. The group now manages a whole block of units fronting on to Holt Road, with four CICs in operation. According to Participant I1, a local resident and acknowledged community leader, "*The secret has been to keep ourselves one-hundred percent independent and free from external agendas. We have actually had to refuse monies from*

several organisations to do that and have even returned a cheque to a local housing association when it tried, and failed, to influence the headline in our community newsletter. All of our operations are owned and run by local residents. Residents can attend our learning programmes at Nexus where we do arts and music classes and or are free to come in for a cuppa at The Croissant if they just want a chat. We offer training in bike maintenance at On Yer Bike and in media skills and communications through the radio station and actively recruit people for The Croissant who are living with mental health problems and who may have struggled to find employment. We have a number of young people working with us who live with full-time carers and our set up means those residents can experience a bit of independence while their carers get some respite time too. We are a community within a community" (Zoom interview, 20th November 2020).

In Wavertree, the community has taken a similar independent approach, establishing Love Wavertree CIC in 2020 and raising funds through an online 'crowdfunding' campaign to take over the lease of a long-established charity shop fronting on to the district's main high street. Operating as 'ReLoved', the former charity shop maintains its trade in second-hand goods in the front shop space, with the addition of locally made artisan products, but has seen its rooms to the rear transformed into a community space for social gatherings, workshops and 'for hire' events. Participant J1 describes how "*the community came together in the summer of 2019 in response to some really negative local and national press articles which slated the area and just didn't feel like the Wavertree we know and love. The articles were written around the same time as we welcomed Vitality Homes to the area, who support people in abstinence-based recovery, which was a concern for some residents. We held a series of community conversation events and community litter-picks over that summer and in September 2019 hosted Liverpool's first Car Free Day celebration, welcoming over five thousand people to a huge street party festival on our High Street. With the support of the community, and particularly the residents at Vitality Homes who have been an incredible in helping to get the shop and hub decorated and ready for action, we have opened ReLoved as a much-needed community space at the heart of our area".*

Figure 4.58: Love Wavertree's 'ReLoved' Community Shop (Source: Love Wavertree CIC)

Participant J1 notes that the initiative launched at "*just the right time*" in terms of the COVID-19 pandemic and lockdowns as it was able to support vulnerable and shielding residents with support packages and to "*fill in for the local library when that shut down for the lockdown. So many of our community rely on the library for the internet and for reading material, not to mention warmth and company, so we were happy to be able to help out with our wi-fi and our 'Borrow-a-Book' club initiative*" (Zoom interview, 9th December 2020).

Figure 4.59: Liverpool 'Car Free Day' 2019, Wavertree High Street
(Source: Love Wavertree CIC)

The CIC's reinvestment of profits into the local area has included a range of community events and workshops and local artist Ali Harwood's 'Dream Tree' mural on the exterior wall of the ReLoved premises, described by Participant J1 as "*the first cultural investment in Wavertree in at least 30 years*" (Zoom interview, 9th December 2020). Wavertree CIC has led an online petition to save the nearby Abbey Cinema, a 24,000 sq ft Art Deco cinema building, dating from 1939 which is under threat of demolition from new owners Lidl GB Ltd. and which, due to its historic links with The Beatles, is currently subject to a listing application with Historic England. The petition has attracted over 5,000 signatures to date, along with national and international media attention. "*We have so much built heritage in Wavertree*", says Participant J1, "*with Picton Clock and our sixteenth century lock-up and the Town Hall all still standing alongside The Abbey, but our richest heritage is in the strength of our community spirit. We don't take things lying down*" (Zoom interview, 9th December 2020). In 2020, a 'spin-out' group emerged from the Love Wavertree initiative, focussed on the Lawrence Road/Tabley Street area in Picton ward and its high concentration of housing of multiple occupation (HMO) development. Initially operating as 'Team Tabley', the group re-branded as the 'Lawrence Residents Action Group' (Lawrence RAG) and is leading a high-profile campaign against further HMO development in the area, under the strapline 'Stand Up for Picton'.

Figure 4.60: Artist Ali Harwood's 'Dream Tree' mural at ReLoved
(Source: Love Wavertree)

4.2.4.2.2 Granby/Toxteth (L8)

The Granby/Toxteth area of Liverpool (within the postcode area of L8) lies immediately to the south of the city centre, bordering the Knowledge Quarter, the main University of Liverpool campus and Liverpool Cathedral. Granby/Toxteth is a culturally rich area, with a long history of inward immigration and particularly so from the West Indies during and after the Second World War. Over half of its population are from black and minority ethnic backgrounds (Liverpool City Council Ward Profiles, 2018). The area has been impacted by long-term underinvestment and, historically, by systemic discrimination, marked by severe inequalities and racial tensions which culminated in the 'race riots' of the 1980s. Socio-economic inequalities persist. 81.5% of the residents of the Princes Park ward (in which Granby and Toxteth sit) claim welfare and 31.3% of its residents have a long-term health condition or disability (Liverpool City Council Ward Profiles, 2018). In 2020, two out of three children in the Toxteth area were living in poverty (UK Gov Department for Work and Pensions, 2020).
Like Kensington, Toxteth was a focal point area for the Blair Government's Housing Market Renewal (HMR) Pathfinder Programme between 2002 and 2010, leading to widespread demolition of its Victorian terraces and, like Kensington, to community protests and High Court battles around compulsory purchase orders. 'The Welsh Streets', a collection of fifteen terraces at the heart of the area, built in the 1850s and named after Welsh landmarks by the Welsh builders who had made Liverpool their home, has been subject to particularly contentious, difficult and ongoing negotiations between local residents, Liverpool City Council, registered social landlords (notably Plus Dane Housing) and private developers. The Cameron government's abrupt cessation of the HMR scheme in 2010 left a number of streets in states of 'half-demolition', along with a number of grassed 'void' areas left between demolition and rebuilding. The scheme proposed by Plus Dane Housing and others for further development of the Welsh Streets area, after the cessation of HMR, was 'called in' for a public enquiry, and halted by the government following an appeal by the local community, supported by national heritage organisation Save Britain's Heritage. A new scheme of refurbishment, led by private developer Place First, began in 2018 and is still in progress.

Figure 4.61: The Welsh Streets housing refurbishment programme, L8 (Source: WSHG)

In 2011, in the wake of the HMR programme, residents in the Granby area formed the Granby Four Streets Community Land Trust (CLT). Directed by a trustee board of local residents and supported by a mix of charitable funding and philanthropic social investment, the CLT took on ownership of a number of houses and shops in the area, working with Liverpool City Council in the years 2011-15 on innovative programmes like the 'Homes for £1' homesteading programme, which saw a number of derelict properties sold to local individuals and families for one pound, in exchange for redevelopment and a commitment to being resident in the home for five-years plus. The CLT established a popular and vibrant market in the area, which has run monthly since 2015 and the Granby Winter Garden, an indoor garden and community space, was launched in 2019.

Figure 4.62: Granby Four Streets market, L8 (Source: Granby Four Streets CLT)

In 2015, the prestigious and globally recognised Turner Prize was co-awarded to Granby Four Streets CLT and its partners London-based architects Assemble, who had been working with the local community to co-create design elements within the homesteading programme since 2012. Toxteth TV, which launched in 2003 as a television and film studios space on Windsor Street at the heart of Toxteth with the support of FACT new media arts centre, based in Liverpool City Centre and the International Centre for Digital Content (ICDC), then based at Liverpool Innovation Park, is still operating as a thriving hub for creative and cultural production. A number of Toxteth's heritage buildings have been transformed into community hub spaces including The Florrie, a former recreational centre for boys built in 1889 and restored with support from the Heritage Lottery Fund (HLF) in 2012 and Toxteth Town Hall, built in 1865 and restored, again with HLF support, in 2004. In 2016, the Grade 2 listed Toxteth Reservoir site, which neighbours the town hall, was used as the host space for 'AURORA', a multi-media experiential artwork which was the centre piece of the 2016 Liverpool Biennial arts festival. "*Our community has art at its heart*", says Participant K1, "*and art has been at the heart of what we have been doing here since the 1980s. Some of it has been radical, protest art, some of it has been painful, some of it has been uncomfortable, but all of it has been real. Art has marked our defeats and our victories. There has been blood on the walls and art on the walls, but the walls are still here. We are still here.*" (Zoom interview, 2nd December 2020).

Figure 4.63: The Florrie Community Centre, L8, Liverpool (Source: The Florrie CIC)

The Kuumba Imani Centre stands on Princes Avenue, one of the main thoroughfares through the Toxteth district. Opened in 2000, the centre combines independent business, conferencing, community and co-working spaces and was realised through the long-term work of The Black Sisters, an activist group for black women, based in the L8 area which from the 1970s onwards led high-profile campaigns for black women's rights, raising awareness of black women's mental health issues, supported women with childcare needs and campaigned in support of individual black women threatened with deportation. The Centre hosts the 'L8 Better Place' project, a community activism support programme which is backed by National Lottery funding and co-ordinated by Theresa MacDermott, one of the founders of Granby Four Streets CLT. Working alongside charity Mandela 8, who are leading development of 'Wayward', a permanent public artwork to be installed in nearby Princes Park as a commemoration to the life and work of Nelson Mandela, the L8 Better Place project has led community consultation around a £4m transformation programme for Princes Avenue and the boulevard which runs down its centre. The Boulevard scheme includes new public realm works, crossings, paving and footpaths and new and restored works of public art which celebrate the area's history, engaging over 150 local schoolchildren in designing wayfinding and interpretation plaques to celebrate the area's culture and pride in its heritage and community. The scheme was officially opened in September 2020. "*The Boulevard is an amazing new space for our community and*

a very public statement that L8 is moving from surviving to thriving", says Participant L1,a local community leader and business owner "*Our work here is built on the shoulders of many others who have gone before us and who have fought before us. L8 A Better Place aims to engage and foster our young people as community activists of the future and to instil them with belief, confidence and pride in this community, and in themselves".* (Zoom interview, 17th December 2020)

Figure 4.64: Princes Boulevard, L8 – new public realm works, 2020
(Source: Liverpool Echo)

4.2.4.2.3 Anfield

The Anfield area of North Liverpool is recognised globally as the home of Liverpool Football Club (LFC). The Anfield football stadium has three tiers to its Main Stand and looms large in the area (and on the Liverpool skyline). In 2019, LFC announced a record turnover of £533million and in December 2020 announced further expansion plans for the stadium to reach a capacity of 60,000 by 2023, at an estimated cost of £60million.

The Breck Road area of Anfield is the tenth most deprived area in the country (IMD, 2019). 36.6% of children in Anfield live in poverty (IMD, 2019). 36% of adults over 18 living in Anfield have no formal qualifications (Liverpool City Council Ward Profile, 2018). 34.2% of Anfield's total population has a disability or long-term health issue and the average life expectancy for males in the area is 71 (Liverpool City Council Ward Profile, 2018).

Figure 4.65: HMR programme demolition in Anfield, Liverpool, 2002
(Source: Mark Loudon, Homebaked)

Like Kensington and Granby/Toxteth, the Anfield area was the focus of a Housing Market Renewal (HMR) Pathfinder programme from 2002 to 2010. The area was particularly impacted by the abrupt cessation of the HMR programme in 2010, which saw over 600 properties that had been marked for demolition in the later phases of the programme either left occupied but in poor condition, left vacant or left derelict (Liverpool Echo, 2012). In 2012, Liverpool City Council announced a £250m regeneration scheme for Anfield, in partnership with Liverpool Football Club and Your Housing, a prominent registered social landlord in the area, realising a new-build housing estate (the Park Estate) and supporting the renovation and refurbishment of a number of the area's Victorian and Edwardian terraced properties, including 348 properties previously marked for demolition.

Figure 4.66: Homebaked, Anfield, Liverpool (Source: Homebaked CIC)

The Homebaked project was also launched in 2012. Its initial focus was a community campaign to save the building that had formerly housed the community's long-established and family-owned local bakery - Mitchell's - from demolition. Mitchell's bakery opened in 1903 and was renowned for baking pies on match days for football fans to eat on their journeys to and from Anfield stadium. The family closed its business in 2010 and handed the remaining lease tenure over to arts collective '2Up2Down' as a workshop space for the 2010 Liverpool Biennial arts festival, who in turn worked with architect firm URBED to host a series of creative workshops for young people from local schools and colleges to collectively reimagine the space. Participant M1, an arts professional, describes how "*during those sessions, people from the neighbourhood saw the shop open and they kept coming in and asking for fresh-baked bread. Clearly there was huge demand"* (Zoom interview, 15th December 2020).

Figure 4.67: Homebaked community design sessions, Liverpool Biennial 2012 (Source: Homebaked)

During the Liverpool Biennial of 2012, led again by the artists from 2Up2Down, the bakery was temporarily opened, selling bread and pies in an arts-led commentary on the destructive nature of the HMR programme and its impact on communities and communal spaces. In 2013, supported by 2Up2Down and URBED, local residents came together to form a social enterprise which would not only seek to reopen and manage the bakery, but to take ownership of local properties as community-owned homes. Homebaked Community Land Trust CIC was established in 2013 as the vehicle for fundraising. Its first task was restoring the former Mitchell's property as a working bakery, primarily through crowdfunding and charitable donations. "*We struggled to get any public grant funding"*, says Participant M1, *"because the building was always at that threat of demolition, but after the end of the HMR programme and by being able to prove the community value of the bakery, we were able to negotiate and secure transfer of the building from the Council as a community asset, for the princely sum of £1".* (Zoom interview, 15th December 2020). The bakery opened for business in 2013 and has become established as a firm favourite and match-day staple for LFC fans, along with a popular online offer (established during the COVID-19 lockdown) and a stall at the monthly Granby 4 Streets Market (Section 4.10.3.2).

Backed by £215,000 funding from national grant funder Power to Change, Homebaked CIC opened its first residential property, the flat above the bakery in 2013. By 2017, the bakery was turning over £250,000 and the CLT was able to secure ownership of the neighbouring block of terraced houses, Oakfield Terrace. Once again, the design process for the terrace has been led by arts collective 2Up2Down and URBED, whose 'Build Your Own High Street' consultation has engaged almost 1000 people through workshops, drop-in events and surveys. The process has included commissioning artist Jayne Lawless, whose 'Dead Pigeon Gallery' had previously been housed in the Tapestry Building at the Fabric District (Section 4.10.2.3), to transform one of the vacant houses on Oakfield Terrace into a working gallery and events space, operating as Dead Pigeon Gallery over 2019/20. In 2019, the group's plans for mixed-use development of the terrace, which will include two 3-bed homes and a number of 2 and 1 bed apartments, including an accessible apartment with space for carer accommodation, two office and events spaces, the 'Homegrown' micro-brewery and dedicated spaces for pop-up retail, were approved by Liverpool City Council. "*Our aim is to put the buzz back into the streets and people of Anfield*", says Participant M1, "W*e want our terrace to stand as an example of what a community can do when they are literally handed over the keys. We are almost ten-years into the process, and it has at times been a long and difficult road, but 100% fun and 100% worth it. Our mantra is and has always been brick by brick, loaf by loaf*" (Zoom interview, 15th December 2020).

Figure 4.68: Homebaked CLT Oakfield Terrace render (Source: Homebaked)

4.2.5 Case Study Interviews - Coding Results

Case study interviews were analysed using NVivo software (exported to Microsoft Excel) to support coding and word frequency content analysis. As a first stage of analysis, fifteen key words relating to the core research questions, further informed by the pilot phase of research, were selected within eight thematic nodes (Table 4.1). The frequency analysis was undertaken with a parameter set to words of a four-letter minimum and with the exclusion of articles, prepositions, pronouns and conjunctions. Weighted percentage results from the word frequency analysis are shown in Table 4.1.

KEY WORD	CASE STUDIES	BOSTON	SEATTLE	GM	LCR
INNOVATION	0.357	0.089	0.077	0.192	0.097
PLACE	0.232	0.008	0.008	0.073	0.074
EMBEDDED	0.010	0.002	0.002	0.006	0.003
SUSTAINABLE	0.211	0.010	0.015	0.052	0.071
CULTURE	0.086	0.004	0.008	0.017	0.091
HERITAGE	0.067	0.006	0.004	0.011	0.083
HISTORY	0.086	0.008	0.006	0.011	0.016
ART	0.096	0.006	0.008	0.017	0.068
SPACE	0.278	0.019	0.017	0.040	0.080
SOCIAL	0.287	0.015	0.027	0.046	0.071
NETWORK	0.354	0.054	0.036	0.051	0.025
ECONOMY	0.220	0.015	0.017	0.046	0.073
COMMUNITY	0.153	0.010	0.011	0.029	0.087
HOUSING	0.134	0.016	0.010	0.034	0.079
DIVERSITY	0.124	0.008	0.016	0.034	0.074

Table 4.1: Case Study Coding Results – Key Word Frequency (weighted %)

Two further analyses were carried out in terms of word frequency. Firstly, a word frequency search was undertaken to identify the ‘top 5’ words occurring overall across the case studies, including the selected key word search terms. The ‘top 5’ words occurring overall, in order of weighted percentage frequency and (including the selected key word search terms) were ‘business’, ‘tech’, ‘open’, ‘innovation’ and ‘network’ (see Table 4.2).

Secondly, a word frequency search was undertaken to identify the ‘top 5’ words occurring in each case study area with the selected key word search terms excluded from the search. The ‘top 5’ terms occurring in Boston/Cambridge in order of weighted percentage frequency were ‘company’, ‘graduate’, ‘global’, ‘capital’ and ‘land’, in Seattle/King County were ‘data’,

‘people’, ‘invest’, ‘square’ and ‘welfare’ and in Greater Manchester were ‘city’, ‘university’, ‘sector’, ‘problem’ and ‘partnership’, and in Liverpool were ‘making’, ‘young’, ‘street’, ‘council’ and ‘area’. (Table 4.2)

OVERALL	BOSTON	SEATTLE	GM	LCR
BUSINESS	COMPANY	DATA	CITY	MAKING
TECH	GRADUATE	PEOPLE	UNIVERSITY	YOUNG
OPEN	GLOBAL	INVEST	SECTOR	STREET
INNOVATION	CAPITAL	SQUARE	PROBLEM	COUNCIL
NETWORK	LAND	WELFARE	PARTNERSHIP	AREA

Table 4.2: ‘Top 5’ Word Frequency Use – Overall and by Case Study

4.2.6 Survey Results

Survey results from both Impact Hub Seattle and The Federation, Greater Manchester were collected through the ‘SurveyMonkey’ online platform and exported to a single Microsoft Excel spreadsheet for ease of reference and comparator analysis. Results of note in terms of particularly strong or weak percentage results or particular relevance to the research questions are presented in the following sub-sections. Full survey results can be found in Appendix iii.

4.2.6.1 Survey Respondent Profiles

At Impact Hub Seattle, 40% of survey respondents self-described as start-ups, 30% as not for profits, 20% established companies, and 10% as SMEs. 50% of respondents worked in the IT sector. The strongest response in terms of target reach was city-wide with 38% followed by global, with 30%. 50% of respondents identified as Founders and 30% as CEO/Directors. Profiling results for Impact Hub Seattle are summarised in Figure 4.69.

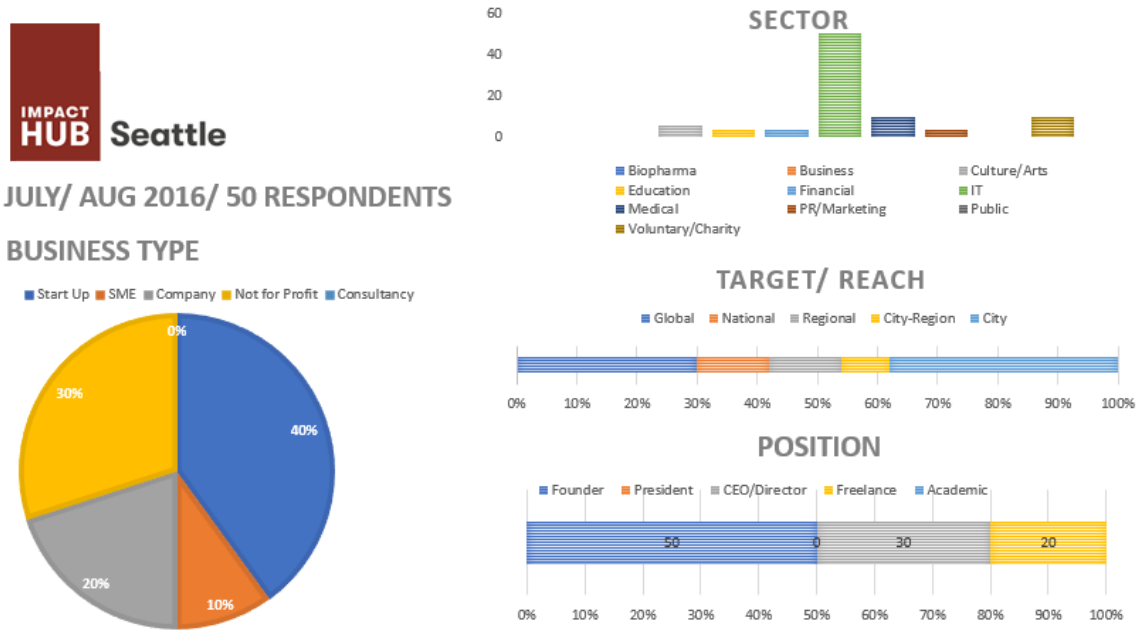

Figure 4.69: Profile section survey results for Impact Hub Seattle

At The Federation, 36% of survey respondents self-described as start-ups, 33% as not for profits, 18% as SMEs, 9% as established companies and 4% as consultancies. 35% of respondents worked in the IT sector and 26% in Public Relations/Marketing. The strongest response in terms of target reach was city-regional with 38% followed by global, with 71%. 44% of respondents identified as CEO/Directors, 30% as Founders and 26% as Freelancers. Profiling results for The Federation, are summarised in Figure 4.70.

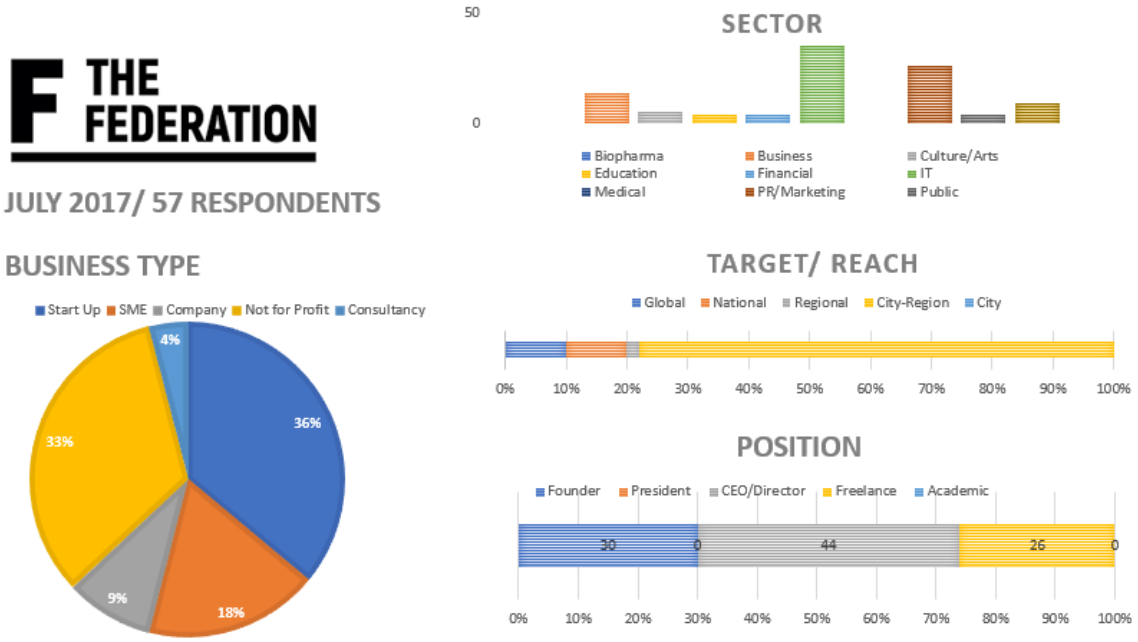

Figure 4.70: Profile section survey results for The Federation, GM

4.2.6.2 The Innovation District

Responses from both Impact Hub Seattle and The Federation, GM highlighted the presence of start-ups (23% and 32%, respectively) and networks (27% and 28%) as strong factors in each area's recognised identity as an innovation district (Figure 4.71). Respondents in both areas noted the 'Start Up Scene' (21% and 26%, respectively) and 'Networking' (28% and 25%) as key to how the area's identity is manifest. Respondents in Seattle noted 'Education' (27%) and 'Transport/Transit' (23%) as key reasons for locating in the area, while respondents at The Federation noted the strength of the local cultural offer (29%). 29% of respondents in both cases noted 'Collaboration' as the strongest way in which their company contributed to the area's social and cultural experience.

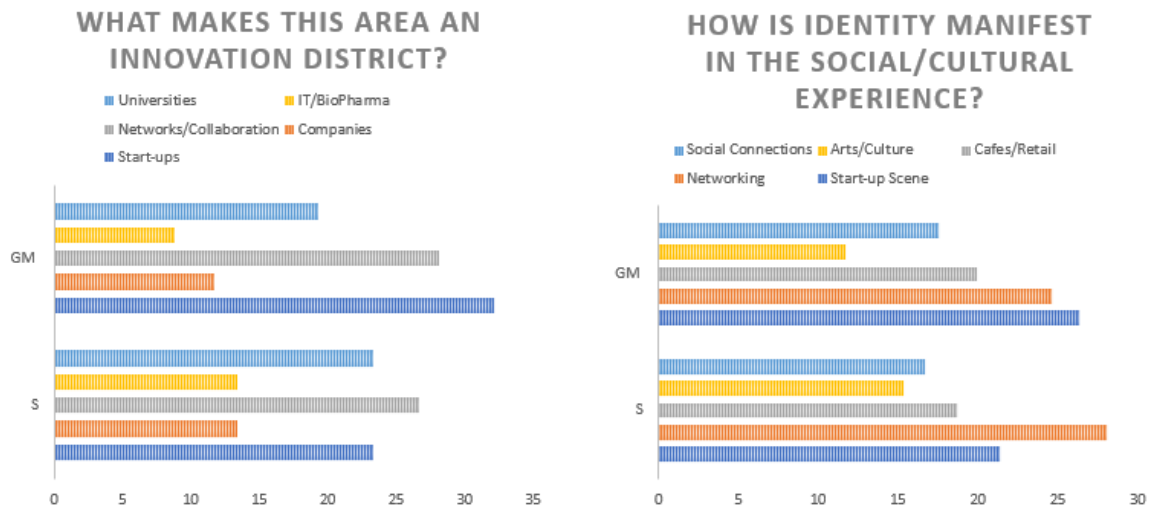

Fig 4.71: Survey responses regarding area identity as an innovation district

4.2.6.3 Innovation – Production, Use and Measurement

32% of respondents at Impact Hub Seattle and 26% of respondents at The Federation highlighted a business need for an innovation process as a key reason for locating in the area. Innovation processes featured strongly too in responses to survey questions around the production, use and measurement of innovation. 27% of respondents at Impact Hub Seattle and 26% of respondents at The Federation highlighted their production and use of innovation as a process. The strongest response in terms of measuring impact of innovation production and use was through effects on profits, supported by 27% of respondents at Impact Hub Seattle and 29% of respondents at The Federation (Figure 4.72).

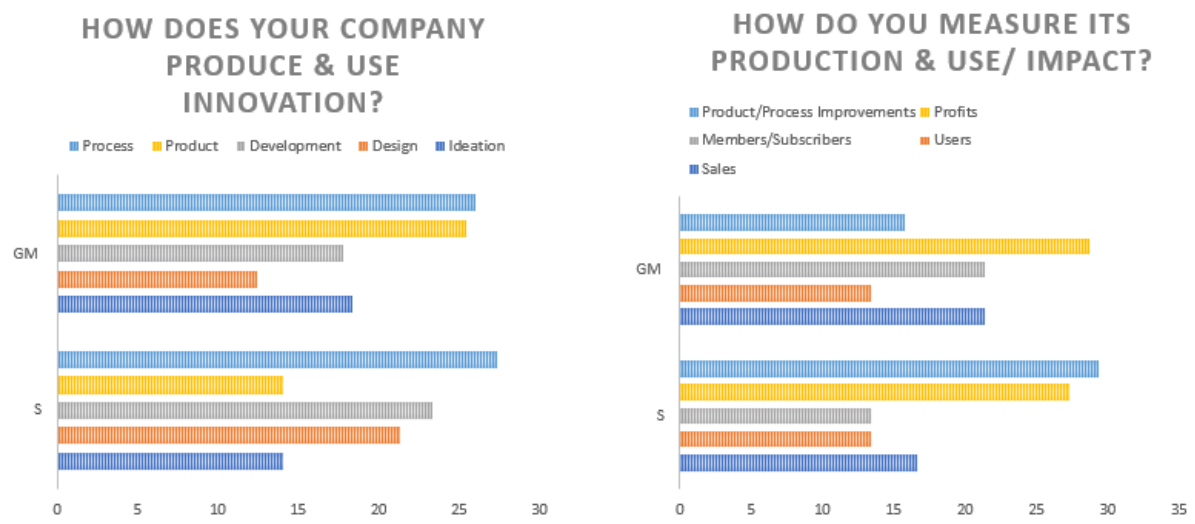

Figure 4.72: Survey responses regarding innovation (production, use and measurement)

4.2.6.4 Connectivity and Interaction

Infrastructural and environmental connectivity was adjudged as 'Important' as a support for innovation by respondents from both Impact Hub Seattle (44%) and The Federation (47%). There was little evidence of companies being engaged in decision making around infrastructural and environmental development, with 42% at Impact Hub Seattle and 40% at the Federation reporting "Moderate" engagement and 44% at Impact Hub Seattle and 39% at The Federation reporting engagement "To Some Extent" (Figure 4.73).

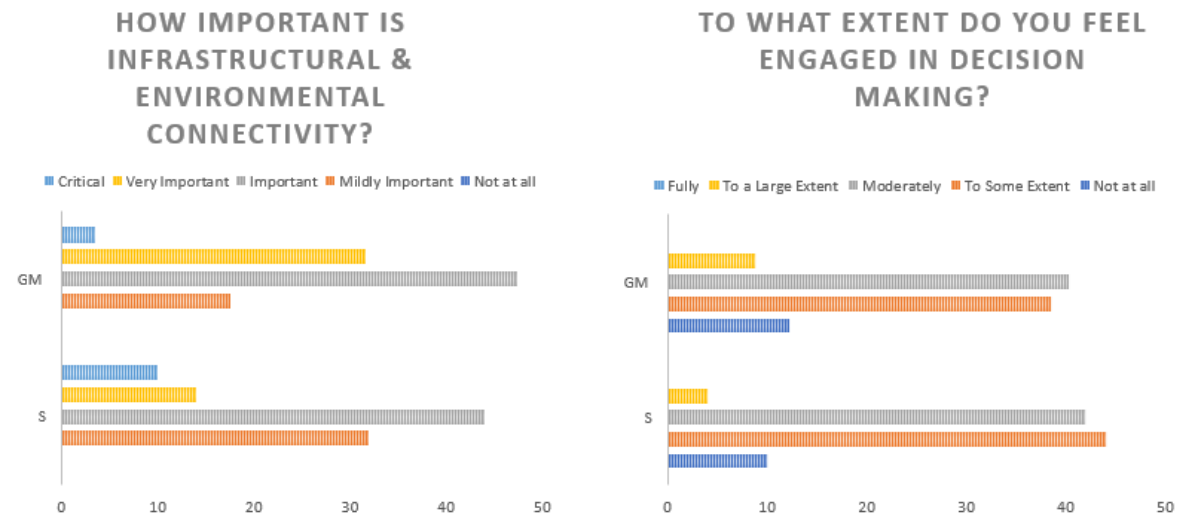

Figure 4.73: Survey responses regarding infrastructural and environmental connectivity

There was strong evidence of interaction with other companies in the area, with 80% of respondents at Impact Hub Seattle and 65% of respondents at The Federation reporting the level of interaction as “Often”. There was less evidence of contribution to social inclusion and equality, with 44% at The Federation and 40% at Impact Hub Seattle reporting contribution “To Some Extent” (Figure 4.74).

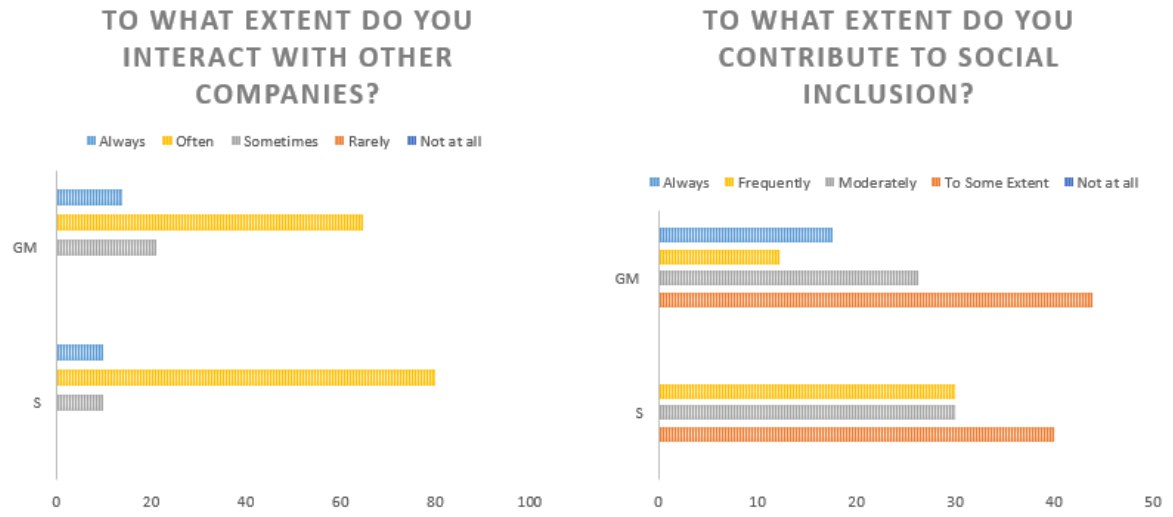

Figure 4.74: Survey responses regarding interaction and inclusion

4.2.6.5 Gaps and Challenges

Unaffordability of housing was highlighted by both respondents at Impact Hub Seattle and The Federation as a potential area of threat or challenge, highlighted by 29% of respondents in Seattle and 30% of respondents in GM. A lack of green/public space was also highlighted by 26% of respondents at The Federation and 21% of respondents at Impact Hub Seattle (Figure 4.75).

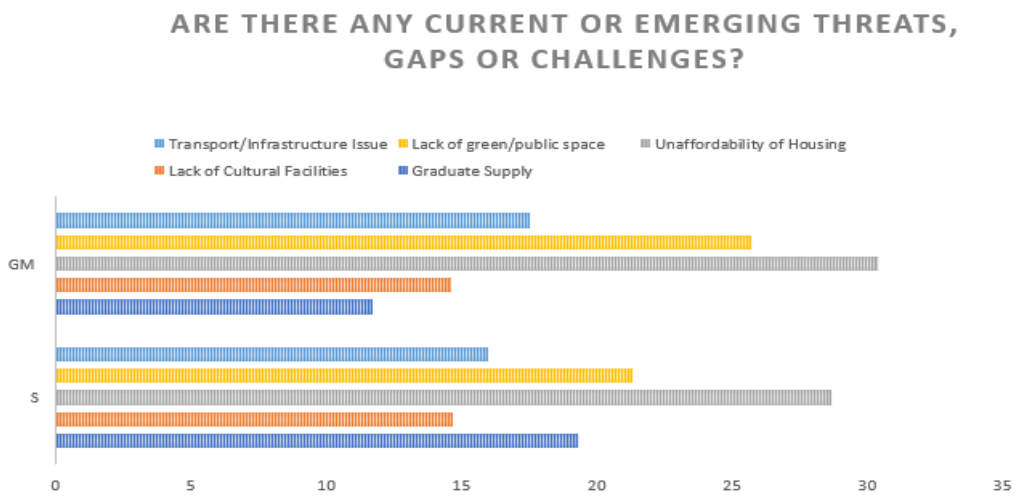

Figure 4.75: Survey responses regarding threats, gaps and challenges

4.2.7 Case Studies - Results Summary

Results from the case studies offer a number of insights into how Katz and Wagner's three typologies of 'innovation district': "anchor hub", "reimagined urban area" and "urbanized science park" (Katz & Wagner, 2014) operate in practice. All three economies explored exhibit strong resonance with the corresponding designated typology (Boston/Cambridge's Kendal Square as "anchor hub", Seattle's South Lake Union as "reimagined urban area" and Greater Manchester's Oxford Road Corridor as an "urbanized science park") and exhibited particular characteristics evident, for example, in the results of one of the word frequency content analysis exercises, which the returned 'top 5' terms in Boston/Cambridge as 'company', 'graduate', 'global', 'capital' and 'land', in Seattle/King County as 'data', 'people', 'invest', 'square' and 'welfare' and in Greater Manchester as 'city', 'university', 'sector', 'problem' and 'partnership'. Content analysis from the Liverpool City-region, explored as a case study example of a 'place-driven' innovation economy typology emerging trough the research, returned 'making', 'young', 'street', 'council' and 'area' as its 'top 5', indicating a very different set of characteristics.

There is strong qualitative evidence emerging from semi-structured interviews in all four city-regions to suggest the emergence of innovation communities outside of the parameters of these 'traditional' centres and, in both qualitative and quantitative results, there is evidence of a strong start-up presence. Environmental and infrastructural connectivity and networks are highlighted as critical to the 'culture' of innovation districts, manifest in widespread

collaboration and interaction with other companies. Quantitative and qualitative results across all four city-regions highlight a lack of diversity and unaffordability and/or unavailability of housing as two particular gaps and challenges, and there is also evidence to suggest efforts are being made in all four city-regions to address these challenges.

4.3 The Sustainable Innovation Wheel

Responding to results and feedback from case study and survey, "The Sustainable Innovation Wheel" (the SI wheel) (Figure 4.76) has been designed and developed as a prototype tool for the evaluation of innovation economies (focussing in the first instance on the evaluation of economies employing Smart Specialisation or 'S3' strategies).

In this novel evaluation model, each axis represents a quality emerging as inherent to innovation districts and economies. The first axis – the *where* – represents spatial factors, including proximity, infrastructural and built environment considerations; the second axis – the *who* – represents social factors, incorporating collaboration, interaction and social connectivity, and the third axis, completing the spokes in the wheel, represents the 'culture' of innovation – the *what* – the connections, networks, processes and innovation described through interviews and survey responses. The fourth aspect, representing the *how*, the identified "energy" of innovation is captured by the dynamic motion of the wheel.

Proposals around the 'SI Wheel' in terms of its application in practice envisage collection of qualitative feedback from citizens with lived experience of the place in relation to their individual experience of its spatial, social and cultural aspects, to be scored quantitively with a simple 'mark out of ten'.

The 'SI Wheel' has been developed and is proposed in response to the stated research objective to formulate of a novel method for evaluating the success of European S3 strategies (as the University of Salford's specialist research area within the MAPS-LED partnership), and the correlated research aims of developing and testing a workable methodology and prototype tool for evaluating and monitoring innovation strategies (including S3) and economies.

Results from the case study areas indicate that most actors within 'innovation districts' produce and use innovation as a 'process' (see, for example, survey results presented in 4.2.6.3). In terms of measurement, however, the focus remains on 'profits' and 'sales', with over 50% of survey respondents in both Seattle and GM measuring their production/use of innovation and

its impact in this way (also section 4.2.6.3). Arguably, the profit/sales approach to measurement focusses on innovation as a commercial *product* and is limited in its application to innovation as a dynamic *process.* Instead, the 'SI Wheel' seeks to capture and reflect the dynamism of networks, collaborations and interactions which characterise innovation as a process, and the related process of 'entrepreneurial discovery' (see Section 2.5.1).

Qualitative feedback gathered from interviews suggests that too often, the perception – and reality – of strategies relating to innovation sees an overly-dominant focus only on the strengths of a particular place. Feedback from both interviews and survey results suggest that this tends to come at the expense of the application of innovation capacity in addressing place-based weaknesses, gaps, challenges, social demands and needs (such as unaffordability of housing and lack of diversity).

Considering Faisandier's assertion that real (lived and relating to context) and specific 'stakeholder needs' should be prioritised in construction of the artefact (as part of the 'Design Requirements' stage of the Design Science model, see Section 3.3.2.2.2) and further that these needs should be translated into 'stakeholder requirements' *of* the artefact, synthesised with systemic requirements, the 'SI Wheel' has been designed to meet the real/lived requirement of a tool for measuring dynamic innovation processes (relating to the context of the innovation district), the perceived need/requirements (threats, challenges) of being able to measure progress towards addressing gaps such as diversity and housing needs, synthesised with the systemic requirements of measuring discrete social, spatial and cultural indicators as well as "whole place" performance.

The 'SI wheel' is envisaged as incorporating all aspects of place that make each economy – and innovation district – unique, including perceived weaknesses and challenges. The dynamic nature of the wheel allows for and predicts innovation economies which not only respond to, but feed off, all aspects of a place and the entire spectrum of place-related indicators as a 'place-driven' innovation economy and which, importantly, is able to measure progress towards addressing shared challenges and achieving shared goals

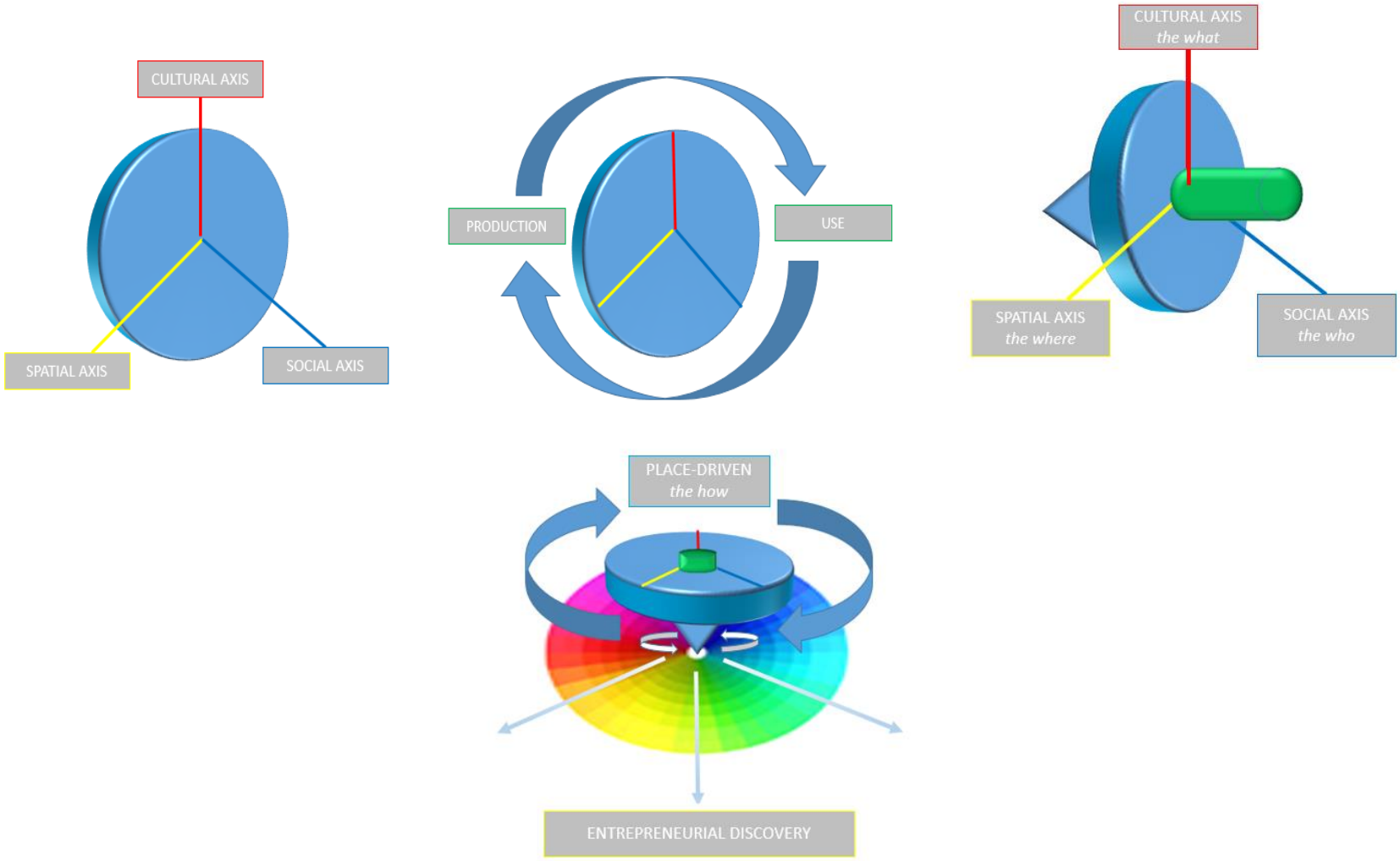

Figure 4.76: The Sustainable Innovation Wheel

4.4 Expert Testing - Exploring the 'How'

4.4.1 Introduction

A series of ten semi-structured interviews was undertaken with selected experts working internationally on projects and programmes identified as employing innovative approaches to development, targeting particular places, projects and programmes with a stated cultural heritage focus, employing open and 'civic' innovation models and/or exploring new evaluation methods. The purpose of these interviews was to test the results and findings emerging from the case studies, specifically testing in different and multiple places, and with a particular focus on the emerging place taxonomy and 'place-driven' approach to innovation. Semi-structured interviews were once again supported by use of the questionnaire (Appendix ii). Additionally (and as part of 'Stage 3' of the design science method: Design and Develop Artefact – see Section 3.3.3.2.3), experts engaged at this stage of the research were asked to respond to the 'Sustainable Innovation Wheel' prototype, to give a preliminary assessment as to its viability as a workable tool, to assist in identifying practical and design issues and, based on their experience and knowledge to make suggestions for improvements, including proposals for appropriate and measurable indicators or metrics related to the identified axes of the wheel.

4.4.2 Leeds - Leeds 'GovJam'

Leeds City Council is the first in the UK to formally adopt the 'GovJam' model as the driver for its Policy Development Unit. Leeds 'GovJam' is part of the global 'ServiceJam' movement, which is built around a forty-eight-hour rapid prototyping model, in which teams are brought together to collaborate in co-creating, designing and testing service and policy solutions in response to a selected theme. The Leeds 'GovJam' team runs an event every six months, in partnership with the Policy Development Unit, which is then challenged to respond and report back to the next event. Participant S, a senior executive in the Leeds 'GovJam' team, explains that '*Jams are open to everyone. For the next Leeds GovJam, members of Leeds Poverty Truth Commission have been invited to bring a more diverse experience into the room. The nature of civic innovation is that it's better served by diversity'*, and adds that the prototyping process is by no means exclusively based on technology: '*Emerging software makes prototyping in code so much easier and there are one or two people who prefer to prototype digitally',* Participant S says, *'but there can be a difficulty in that - if one person is at the computer he or she is in effect driving the process. It creates much more of an open forum when people are building*

with paper, cardboard or Lego'. (Zoom interview, 9th November 2016) The Leeds GovJam model has been running since 2015, with successes including the introduction of a city-wide community owned energy scheme, although Participant S adds that '*the experience is less about the output and more about the journey'.* In 2017, the Leeds GovJam team led a multi-city, UK-wide young person's GovJam initiative with the Department of Work and Pensions' Digital Academy.

Figure 4.77: Leeds City Council GovJam prototyping event, 2016 (Source: Leeds GovJam)

4.4.3 Barcelona - Citizen Assemblies & Superblocks

Innovation in policy design is also being trialled in Barcelona by the incumbent political leadership Barcelona en Comú (BeC). BeC was founded in 2014 as a grassroots coalition, growing out of the '15M' mass-mobilised civic action movement in response to the austerity agenda and economic crisis, and was elected to power in 2015 under the leadership of Ada Colau, the city's first female Mayor. Its electoral manifesto and policies were crowdsourced through a network of open 'citizen assemblies', held in both real and virtual spaces. Three-hundred people attended an open working weekend to co-produce its code of ethics in October 2014, which was also live-streamed to an online audience of thousands. Since its election, BeC has implemented that co-produced code of ethics as its constitution and has set about a large-

scale transformation of the city's civil service, transparency, data and communications infrastructure in support of its delivery programme, including establishing a formal framework and code of governance for a new network of district-based citizen's assemblies. Participant T, a senior executive at the city's planning directorate, explains how '*policies are democratically shaped by themed citizen assemblies, who vote on key elements for inclusion. Our main challenge is not lack of participation, but quite the opposite, the need to reconcile individual and community priorities across the city's ten districts and seventy-three neighbourhoods*' (Participant T interview, 17th November 2016).

Figure 4.78: 22@ Barcelona (Source: 22hq.es)

Innovative policies developed through the assembly-led co-design process include the 2017 creation of a city-wide solar energy co-operative and the 'Superblocks' initiative, launched in December 2016 and designed to minimise traffic-flow through the city and to re-designate sixteen blocks of the city's streets as public spaces for citizen-led activity. The first four areas to trial the Superblocks initiative were Gracia, Born, the San Antoni market and Pobleneu, home to 22@, widely acknowledged as a pioneering innovation and technology district. The 'Superblocks' in Pobleneu have heralded a refreshed development plan for the area, marking

twenty years since its initial development. The plan has five key strategic development objectives, the fourth of which is a commitment to 'Renewed attention to Poblenou's identity, culture and heritage' (Ajuntament de Barcelona, 2020). In 2020, a major expansion of the 'Superblocks' programme was announced which will see the whole grid of the city's central Eixample district, a 16-acre space covering 21 streets and over 500 blocks, made 'car free' and pedestrian-friendly over the next decade. A public design competition is scheduled to launch in May 2021 for the €38 million 'Let's Fill the Streets with Life' scheme, with works due to start in 2022 (Ajuntament de Barcelona, 2020)

Figure 4.79: Barcelona 'Superblock', 2017 (Source: publicspace.org)

4.4.4 Detroit – Future City & Reimagining the Civic Commons

Detroit's 'Future City' consultation launched in 2010 and focussed on harnessing the resource and capacity of its citizenship in addressing the city's significant problem with vacant lots which numbered over 150,000 vacant lots and around 100,000 vacant housing units (Detroit Future City, 2010). Hundreds of 'roaming tables' installed across the city as outdoor 'office spaces' for local communities to meet and design approaches to vacant spaces in their neighbourhoods, engaging over 6000 residents. The city also developed an online gaming site 'Detroit 24/7' which featured a virtual city-building platform, and which generated 8000 responses. The initial project saw a local volunteer force of thousands engaged in painting bike lanes, installing community gardens and bringing vacant homes back to life, and has since developed into the formal Future City programme, launched in 2013. The Detroit Future City programme leads on open space and land use strategy for the city, founded on a fifty-year plan with the dual objective of reducing vacant residential lots and ensuring a new, innovative and sustainable land use portfolio (See Figures 4.80a and 4.80b).

The latest figures, from 2017, report a reduction of vacant lots by 50,000 to just under 100,000 and a reduction in vacant housing units by 20,000, to just under 80,000 (Detroit Future City, 2017).

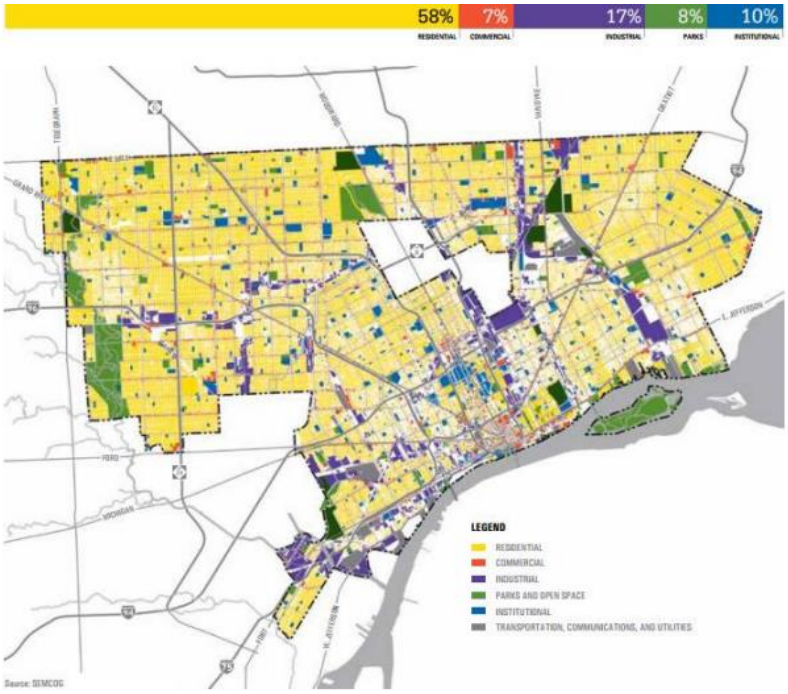

Figure 4.80a: Map showing dominance of residential land use across Detroit (Source: Detroit Future City, 2017)

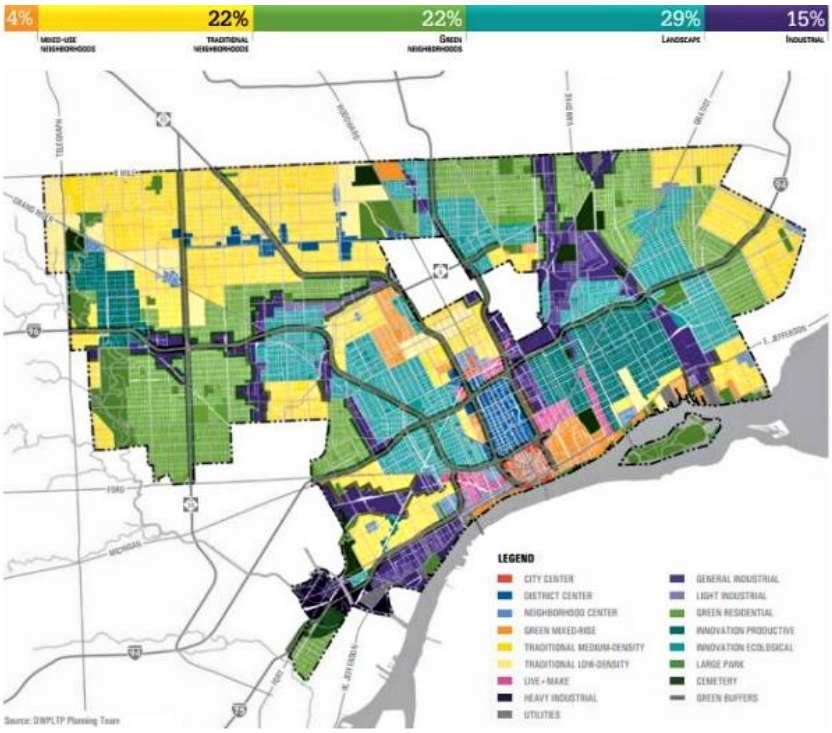

Figure 4.80b: Diversified Land Use Proposals for Detroit
(Source: Detroit Future City, 2017)

Spinning out of the Future City programme, Detroit is also at the forefront of the US-wide 'Reimagining the Civic Commons' initiative which seeks to elevate public spaces and their civic meaning as 'commons' in order to re-define the relationship between places and their 'anchor institutions', particularly universities. Participant U, a senior executive with the project, describes how '*for too long these large parks and open spaces have served to keep communities away from the hallowed turf of our universities, they are no man's lands that people shouldn't dare to dream to cross'*. Participant U says the city '*hopes to rekindle the sense of pride current residents should have living in a neighbourhood adjacent to our wonderful institutions of higher learning'* (Participant U interview, 14th October 2016). Working with the local community in the Fitzgerald district of the city and with neighbouring Detroit Mercy University, the programme's flagship development for Detroit has seen 25 acres of vacant land transformed into the Ella Fitzgerald Park, launched in 2018 as a 'green corridor' between Fitzgerald and Mercy and delivery of the 'Working with Lots' programme, a large-scale trade, skills and enterprise training for people living locally, including offering space for new businesses in formerly vacant units brought back into use on the communities newly-pedestrianised Main Street and training in green-space management and sustainability. "*Investment in space is one thing*", says Participant U, "*but it is the investment in our people, our human capital, that brings this place to life*" (Participant U interview, 14th October 2016).

4.4.5 Helsinki – Innovative Cities/ Helsinki Lab

Helsinki – a relatively small city by global standards – has three-times been identified by the CITIE Index (CITIE 2015, 2016 and 2019) as the third most innovative city in the world, behind only New York City and London. The 'Innovative Cities' programme, launched in 2015, focussed on smart navigation and digitalised services in the public spaces and squares in Helsinki's Kalasamata district, with the strategic vision of creating 'One more hour a day' for Kalasamata residents.

Figure 4.81: 'One more hour a day' – The Stategic Vision for Kalasamata, Helsinki (Source: myhelsinki.fi)

Supported through the Innovative Cities programme, the 'Helsinki Lab' project, launched in April 2016, focussed on what Participant V, a senior executive with the project, describes as "*making time for people to think better and act smarter*" with features including the creation of digitalised 'slow spaces', public spaces featuring augmented reality interventions, designed to facilitate slow movement in order to increase real and virtual interaction. "*The idea is that we save time for people so that they have time to make better choices for their health and family and the environment. The time we can save by simply alerting someone as to when transport is two minutes away instead of waiting at the stop cumulatively becomes time that they could be using for something else*", says Participant V, "*We like slow living and fast thinking*" (Zoom interview, 2nd December 2016).

In 2019/20, the Helsinki Lab delivered a year-long programme of ideas acceleration, where people working in the public sector and civil service were invited to take a 'year out' of their careers to work as experience leads with the Helsinki Lab team in developing artificial intelligence (AI) solutions to identified issues and problems in their area of expertise. The accelerator programme realised seven AI initiatives, including roll-out of AI-led fire inspections, proposed by and developed alongside an inspector from the Helsinki Rescue Department, and 'Löytö', an intelligent platform for culture and tourism recommendations.

4.4.6 Rio –Hacker Lab Rio

Brazil is a global centre for internet and online commerce, ranking fourth in the world in terms of online purchases, with fifty-nine percent of transactions made by card (JP Morgan, 2019). It is also acknowledged as a country that is both susceptible to cybercrime and as a global centre for 'hackers', accounting for 5% of global hacking crimes in 2017 (Kshetri, 2018). "*The hacking movement in Brazil grew out of the 'Programa Cultura Viva' which saw over three-thousand cultural projects supported across the country, many of which emphasised collaborative production and alternative licences for technology platforms, taking from the Brazilian traditions of 'mutirão', small collectives of working collaborating on a shared task, and 'gambiarra', doing the best with the tools you have at hand*" says Participant W, "*The hacker movement is a cultural movement, with Brazilian culture at its heart.*" (Zoom interview, 9th December 2016).

Hacker Lab Rio is a permanent physical and virtual e-democracy space attached to the Brazilian House of Representatives. Launched in 2015, the physical space is an open forum for all citizens, described in the associated parliamentary resolution as "open for access and use by any citizen, especially programmers and software developers, members of parliament and other public workers, where they can utilize public data in a collaborative fashion for actions that enhance citizenship" (Brazil Chamber of Deputies, 2014).

The virtual space replicates City Hall in digital form and is linked to the 'Hacker Lab' application, which allows citizens to virtually interact with the space, to vote on proposed bills of legislature, to track the activities of elected representatives (including analysing speeches and monitoring expenses), to volunteer for community projects and to interact with other users. Voluntary contribution is logged, and users accumulate points. Participant W describes the approach as "*having the freedom to play. Politics is a game, and you can see that in the City Hall space – both virtual and real. We are freeing the imagination of the city and exposing what is lacking from democratic platforms in 'real life'. There are still huge areas of our city's governance that are unmapped, data that remains closed, 'no go' zones. In the relative safety of the virtual world, we have been able to open those doors, even just a little"* (Zoom interview, 9th December 2016).

4.4.7 Dumfries – Midsteeple Quarter

Figure 4.82: Midsteeple Quarter and proposed render (Source: Midsteeple Quarter Project)

The Midsteeple Quarter Project is a community-led development campaign in Dumfries, Scotland. The project is focussed on a section of the historic Dumfries High Street which surrounds the Category A listed Midsteeple building, known colloquially as 'The Midsteeple Quarter'. Like many high streets across the UK, Dumfries High Street has been subject to a significantly declining footfall and cumulative disuse and disrepair over the last twenty years, marked physically by a number of derelict buildings and vacant units. In 2017, The Stove Network, a local arts and artists network which manages 'The Stove' building, a popular public arts, events, café and social enterprise space that fronts onto the High Street, led the local community in the foundation of Dumfries High Street Limited (DHSL). DHSL is a community-led and membership-owned benefit society which trades as Midsteeple Quarter and oversees the Midsteeple Quarter development project. Participant X describes The Stove Network's role as initiators of the project as "*just one example of community-led placemaking in our region where creative and cultural practitioners have taken a leading role. Without a dedicated enterprise agency for the South of Scotland with a cultural and social remit like Highlands and Islands Enterprise in the North, grassroots placemaking activity in the South has had no option but to be enterprising, opportunistic and creative. What has sprung up is nothing short of a Darwinian evolution, with small pockets of enterprise, engagement and innovation that are uniquely adapted to local conditions and run on a bewildering mix of financial support, often*

stretching the boundaries of funders' remits to bring precious resources direct to where it is most needed and best used - the grassroots of our communities" (Participant X interview, 10th January 2017).

Figure 4.83: 'The Stove' café, Dumfries (Source: Author's own)

The Midsteeple Quarter site is located in Dumfries Central, which is one of the top 10% most deprived areas in Scotland (IMD, 2016). Dumfries also has one of the lowest levels of residential living of any city centre in Scotland (DHSL, 2019). The Midsteeple Quarter project seeks to bring a total of ten buildings in the area back into use, proposing residential uses for the upper floors and a mix of established retailers, independent ventures, social enterprises, third sector and community use spaces at ground level. Participant X says community ownership sits at the heart of the Midsteeple Quarter vision: "*For too long, Dumfries has suffered from the impacts of fragmented property ownership, greed and short-termism, where developers have focussed only on immediate and short-term investment outcomes with little regard for the wider impacts for Dumfries or for the people of Dumfries. Our work starts with Dumfries, and we are the people of Dumfries. As well as bringing properties into community*

ownership, we are keen to work with current owners to explore options to pool assets, which as well as pooling risks brings the potential for pooling benefits, particularly in terms of advocacy and much-needed interventions to the public realm. What benefits one of us benefits all of us". (Participant X interview, 10th January 2017).

In 2018, Dumfries and Galloway Council transferred ownership of 'The Bakers Oven' building to Midsteeple Quarter via Community Asset Transfer and in 2019, two further buildings – 'The Smithy' and 'The Press' were secured with support from South of Scotland Enterprise, the newly established economic development agency for the South of Scotland.

4.4.8 Barking and Dagenham – Everyone, Every Day (Participatory City)

'Everyone, Everyday' is a project exploring similar models of community asset ownership, led by parent-charity Participatory City and based in Barking and Dagenham. Launched in 2016 and supported by £3.95m in funding, principally through the Big Lottery Fund, the project is a collaborative initiative with Barking and Dagenham Council and operates as an open access and participatory 'ecosystem' platform for neighbourhood development. Participant Y describes the project as '*bringing ideas together in a space made for hope, optimism, wellbeing and prosperity'*. Barking and Dagenham, Participant Y says, is '*the perfect place for this to happen, a close and pro-active collective of communities, with a shared heritage steeped in industry, creativity and energy'*. The Everyone, Everyday project operates across five neighbourhood spaces, four high street (former retail) units and The Warehouse, a 3,300 sq meter open access-maker space, launched in 2017 and the largest space of its kind in the UK.

Figure 4.84: The Warehouse, Barking & Dagenham (Source: Participatory City)

The project is supported through parent-charity Participatory City, which has led a ten-year programme of global research and development in participatory development and systems change. Its projects include the 'Here and Now' school for systems change and the 'Transdisciplinary Research Project', supporting transdisciplinary research in place-based contexts. According to Participant Y, the 'Everyone, Everyday' project has been a large-scale "*action research*" project which has brought "*ten years of research to life*" and which has realised The Warehouse as "*a large-scale prototype*". Participatory City's R&D support for both projects is focussed, says Participant Y, on ways to capture the value in "*a quantifiable way that speaks to investors. How do we measure the difference we are making to individuals,*

neighbourhoods, communities and the borough as a whole in a way that can be articulated as a viable investment proposition?" (Participant Y interview, 18th January 2017).

In December 2020, it was announced that The Warehouse will support a post-COVID response for Braking and Dagenham as the host space for 'Essential Works', a new programme of learning, making and upcycling focussing on essential items for sustainable living.

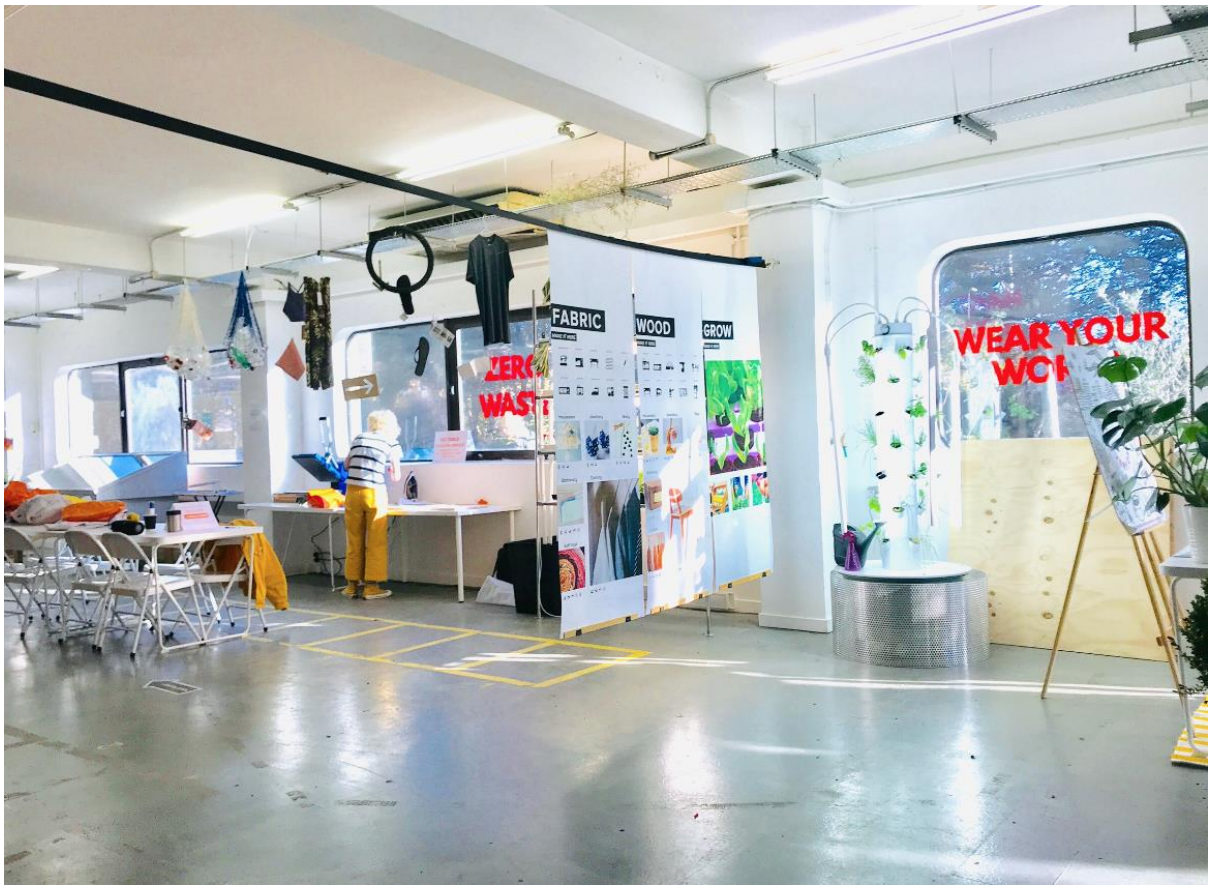

Figure 4.85: The Warehouse interior, Barking & Dagenham (Source: Participatory City)

4.4.9 Mexico City – Conecta Cultura

Cultural heritage is the key driver for Mexico City's *Conecta Cultura* initiative and a flagship programme in the city's attempts to re-assert identity and heritage in a cultural offer which has previously been instrumentalised for the benefit of the tourism economy. The programme creates and supports social innovation programmes that foster and facilitate cultural connectivity. Participant Y shares as an example how the initiative is bringing together young founders from the city's burgeoning tech start-up scene with groups of women from Mexico City's indigenous populations, who face increasing disenfranchisement with the continued

digitalisation of the city's civic platforms. The women and founders work together to share skills, in an exchange programme based on similarities between weaving patterns and coding patterns. "*These women are the keepers of our cultural heritage, but they are retreating, and with them our heritage, because they speak, but aren't understood. Conecta Cultura has worked with groups of women in Oaxaca, Chiapas and Veracruz communities over two or three years, building trust and understanding, and over the last two years has brought them together with young digital entrepreneurs in these beautiful moments of intergenerational exchange, swapping wi-fi for weaving"* (Zoom interview, 3rd February 2017).

Conecta Cultura acts as an advocate to government for disenfranchised individuals and groups, using informal sessions as routes for feedback. The feedback loop works, says Participant Z, by "*creating spaces in which people feel welcome, confident and at ease. We are taking part in activities that they recognise and are skilled in, using language they understand, and showing respect. We are there to learn from them.*" (Zoom interview, 3rd February 2017).

A co-produced event sharing results from the work was held in September 2018 (Figure 4.55).

Figure 4.86: Conecta Cultura event prospectus, September 2018

4.4.10 St. Helens – Heart of Glass

The town of St. Helens in the North West of England is pursuing a similarly 'culturally led' development strategy, but from a dramatically different starting point. St. Helens faces significant socio-economic challenges. In 2016, 2,305 foodbank vouchers were claimed in St Helens, and the proportion of children living in poverty was 26.3%. 10% of its population within the borough is unemployed (St Helens MBC, 2016). In 2013, Arts Council England's 'Active People' survey (ACE, 2013) ranked St. Helens as fourth lowest in the country, with just 31.7% of adults regularly engaging with the arts (where 'regularly' is defined as three engagements per year). The Heart of Glass initiative, developed in response to that lack of cultural engagement, was launched in 2014 as the Arts Council's flagship centre for collaborative arts practice, working together with the communities of St. Helens in co-producing ambitious and contemporary art. By 2016, supported by the three-year Creative People and Places (CPP) programme, Heart of Glass had had a project reach of more than 101,000 engagements, with 92% of that audience being resident in St Helens, and 74% from lower and medium engagement audience spectrum segments (ACE, 2016). Heart of Glass' success has been reflected in St Helens Council's positioning of arts and culture as the central tenet in its overarching development strategy and the borough's adoption of the branding strapline 'St Helens: Culturally Centred'. Participant Z1, a senior executive with the project, describes the organisation's inclusion in the CPP programme as a '*catalyst, which has brought about a transformational step-change in the pace, direction and resonance of the programme, making something which was so far removed it may as well have been in the sky, entirely accessible ad understandable to the people on the street'* (Participant Z1 interview, 8th March 2017).

For Participant Z1, Heart of Glass and the town and people of St. Helens are intertwined: '*Heart of Glass is made with, of and for St Helens. People, both individually and within those communities, are central to both thinking and practice'.* The Heart of Glass programme has included co-production of a number of artworks, interactions and experiences in the city centre and civic spaces, exploring 'The Town as a Gallery'. Interventions include the 'Bliss' skate-park, developed through a facilitation programme working with members of the skateboarding community and older people's groups, which incorporates a number of co-designed, and skateable, public art sculptures within an intergenerational public park space, built on the site of a former disused car park. *"These projects are creating an invaluable space for dialogue, research and experimentation in which the inter-relationship between people and place can*

collectively be explored', says Participant Z1, *'This is the space where innovation happens".* (Participant Z1 interview, 8th March 2017).

4.4.11 Wigan – The Deal/ The Fire Within

The borough of Wigan, which lies in the city-region of Greater Manchester and just over twenty-miles to the north west of central Manchester, has seen over 40% of its budget cut over the last ten years as part of the Government's austerity agenda. It is one of only seven council areas in England to have seen cuts of over 40% and has been ranked as the third worst-hit area in the country (Wigan MBC, 2016). 13% of its districts fall within the top 10% most deprived wards in England (IMD, 2016) and 11.5% of residents claim out of work benefits (Wigan MBC, 2016). In 2014, Wigan Council launched 'The Deal', a borough-wide strategy co-produced with residents and communities which set out a shared mission of improvement for the borough over ten co-created priorities and, importantly, set out clear roles for the council and clear roles for the people of Wigan (as 'The Deal' of the title). Unlike several councils faced with austerity measures, and in direct response to the community priorities put forward in 'The Deal', Wigan MBC has protected frontline services including libraries, invested £7.5m in community groups over the past 5 years and introduced a new programme of 'Start Well' family and children's centres. The result of embracing community participation and shared priorities has been overwhelmingly positive with, for example, a rise of 80% in domestic recycling rates between 2014 and 2017, saving Wigan MBC more than £1 million per year. Despite losing £160million from its core budget, Wigan is one of only two councils in the country to have frozen council tax rates over 2019 and 2020.

Figure 4.87: The Fire Within, Wigan Prospectus (Source: The Fire Within)

In 2019, Wigan Council launched Stage 2 of 'The Deal' based on feedback from 'The Big Listening' programme, which was held over the course of 2018 and which again saw mass community participation (with over 6,000 engagements) in setting out shared priorities for the borough to 2030. Digital and culture were identified as key priorities, resulting in the Digital First strategy, tackling digital exclusion rates, and digitalising a range of services including investment in digital platforms to support adult social care and independent living, and the development of a new ten-year cultural manifesto for the borough, 'The Fire Within'. Co-developed with international artists Al and Al, The Fire Within sets out an ambitious cultural vision for the borough and has already seen the upper floors of the former leading shopping centre in central Wigan, The Galleries, transformed into an interactive and open access arts and cultural space, displaying internationally significant works from leading artists, several of whom have links to the borough. Participant A1, a senior executive with the Local Authority, describes 'The Fire Within' as the centrepiece in the Deal 2030: "*Throughout the Big Listening project we kept hearing that people didn't want to have to go to Liverpool or Manchester to experience arts and culture, they want to experience it here on their home soil. People are rightly proud of our cultural heritage and have asked us for space to celebrate that. Our response has been to give this huge part of the town centre back to the people. The Galleries not only hosts our Fire Within exhibition space, but also our community makerspace, pop up creative studios and artist development programme. We are committed to celebrating our shared cultural heritage and to lighting the creative spark for our young people and future*

artists". Participant B1, an artist, describes 'The Fire Within' as *"a homecoming. I am a Wiganer, through and through, and this town and its people means something to me, as all our roots do. The place where we are born inspires us, shapes us, and should be fought for. It should be the place we dream it to be, because if not, then what is stopping that from happening? We hope 'The Fire Within' will spark the next generation to search for the creative dreams in their hearts. We are all the imagineers of our future*". (Participant A1 and B1 Interview, 15th March 2017).

Figure 4.88: 'The Fire Within' Gallery Space, The Galleries Shopping Centre, Wigan (Source: The Fire Within)

4.4.12 Expert Testing Interviews - Coding Results

The deductive coding strategy used in analysis of case studies was repeated as the basis for word frequency analysis of expert interviews, performing a word frequency search in relation to fifteen selected key words. The results of the search are shown in Table 4.3. The 'top 5' words used in ten expert interviews from within the key word terms in order of weighted percentage, were 'community', 'culture', 'innovation', 'place' and 'social'.

KEY WORD	EXPERTS 1
INNOVATION	0.064
PLACE	0.051
EMBEDDED	0.001
SUSTAINABLE	0.019
CULTURE	0.070
HERITAGE	0.020
HISTORY	0.006
ART	0.032
SPACE	0.023
SOCIAL	0.043
NETWORK	0.010
ECONOMY	0.031
COMMUNITY	0.086
HOUSING	0.033
DIVERSITY	0.037

Table 4.3: Expert Testing – Key Word Frequency Results (weighted %)

A secondary (inductive) word frequency analysis was performed to establish the 'top 5' words used in expert interviews from outside of the selected key word search terms. The 'top 5' words used, in order of weighted percentage frequency, were 'creative', 'virtual', 'energy', 'participation' and 'funding'.

4.4.13 Expert Feedback on the artefact - the 'SI Wheel'

Relating to the 'Evaluation' stage of the 'Design Science Method' (see Section 3.3.3) and building on March and Smith's framework (March & Smith, 1995) for artefact evaluation in Design Science research (see Section 3.3.3.2.5), the ten experts engaged at this stage of the research were asked as part of the semi-structured interview process to provide informal qualitative commentary and feedback on the 'Sustainable Innovation Wheel' prototype tool (SI Wheel, section 4.3). Experts were presented, for reference, with March and Smith's fourteen key criteria (see Figure 3.14) and asked to provide informal feedback on the basis of those considerations in relation to the prototype 'SI Wheel'. The fourteen key criteria identified by March & Smith (1995) and used at this stage of the research are: completeness, ease of use,

effectiveness, efficiency, fidelity with real world phenomena, generality, user and economic impact, internal consistency, level of detail, operationality, robustness, simplicity, understandability (March & Smith, 1995). Feedback included the following comments:

"*Looks simple enough to use, but is there enough detail? Will it tell us what we need to know*?" (Participant A1 interview, 15th March 2017)

"*Simple and elegant. As easy as driving a car!"* (Participant W interview, 9th December 2016).

"*easier to understand than the S3 self-assessment matrix*." (Participant V, 2nd December 2016

"*Where is the economy? Where is wellbeing*?" (Participant X, interview 10th January 2017)

"*It makes some pretty big assumptions around an understanding of what 'spatial', 'social' and 'environmental' mean. Can metrics and measurables be added for each section*?" (Participant S, interview 9th November 2016)

Several experts referred to the 'understandability' of the wheel as an everyday concept and as having demonstrable 'fidelity with real world phenomena', including one observation that a number of existing models representing economic systems utilise a circular shape. One expert was keen to understand 'how a circle becomes a wheel', and asked "*How can the dynamism of the proposed model be captured when it is printed on paper or shown in a word document*?" (Participant S, interview 9th December 2016). Another expert asked: "*What is it that makes the wheel turn? We need to know how it turns and why it turns. How fast does it go? Where is it going*?" (Participant Y, interview 18th January 2017).

One expert focussed on the relationship between the SI Wheel (as artefact) and the spectrum of place (as context), saying: "*I think understanding what makes up the colours of the spectrum is just as – or even more – important than understanding the wheel*." (Participant Z1, interview 8th March 2017).

Participant Y captured the essence of a number of comments by asking: "Can it operate at any scale?" (Participant Y, interview 18th January 2017). There was an interest from the experts to explore the prototype's utility as a tool not just for measuring performance of a particular place, but also for exploring relationships and connections and for assessing comparative performance with other places. A number of experts expressed a preference for a flexible and broad scope tool, able to measure the performance of 'place' across different levels and scale (local, regional, national and global).

4.5 An Emerging Place Taxonomy

Building on expert feedback and commentary on the prototype artefact, and in particular the call for further exploration of the conceptual definitions of and relationships between the *where, what, who* and *how* of the "Sustainable Innovation Wheel', and considering also their individual and collective application to both the place paradigm and to the three (spatial) typologies of innovation district proposed by Katz and Wagner (2014), a new hierarchy of 'place' has been identified as emergent through the research and has been developed as a new proposition of emerging taxonomy. It is presented here as new knowledge.

As shown in Table 4.4, relating the four concepts (*where, what, who* and *how*) to the four layers of an emerging place paradigm (place-blind, place-based, place-grounded and place-driven) can be extended to map across to the three identified innovation district typologies, and further applied to related tripartite sectoral groupings and ideological constructs, as the pre-cursor to a proposed 'fourth' layer in each case. The fourth layer foregrounds *how* innovation is produced and used, envisaging and articulating a holistic and mission-led model of 'grassroots', place-driven innovation. The taxonomy proposed here is the basis for a proposition for a new economic paradigm emerging from the research characterised – given the foregrounding of the fourth layer of activity – as 'A Fourth Way'.

INNOVATION SPACE	SECTOR	CONSTRUCT	CONCEPT	PLACE
Science Parks	Private	Spatial	Where	Place-blind
Anchor Plus	Public/Academic	Institutional	What	Place-based
Reimagined Urban Areas	Social/3rd	Cultural	Who	Place-grounded
Grassroots	Holistic/4th	Mission-led	How	Place-driven

Table 4.4: An emerging 'place' taxonomy

The particular characteristics of each typology of 'place' (Column 5) and the subtle, but cumulatively significant, differences between 'place-blind', 'place-based', 'place-grounded' and 'place-driven' approaches is explored further in Section 5.2.

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4.6 Action Research – M4

Figure 4.89: M4 Project logo (Source: manchester4.uk)

The M4 project was initiated in February 2017, initially by 'seeding' the idea of a 'civic innovation' space with a group of ten core stakeholders. As an action research project, M4 was designed to test results and assumptions around the emerging place taxonomy, 'A Fourth Way' and the related 'fourth' typology of innovation district, that is place-driven, citizen-led and related to the community, the civic sector and the conceptual '*how*' space. Three open co-design events were held between February and April 2017, focussing respectively on vision, mission and values, and the project was launched formally in May 2017.

Figure 4.90: M4 co-design session materials, February 2017 (Source: Author's own)

The M4 model (Figure 4.91) was co-designed and co-produced during those sessions and is based on the triangulation of three key concepts – 'thinking', 'doing' and 'feeling'. Each concept corresponds to a particular action – research, production and capacity building, respectively – and is represented by a particular initiative: Citizen-i, a co-operative and citizen-led think tank (thinking), Impact Hub Manchester, a co-working and social impact incubation space linked to the global Impact Hub network (doing), and 'Our GM', a GM-wide citizen consultation platform affiliated to the GM Mayor's office (feeling). The M4 project, named to reflect the emerging ideological 'fourth' space, and fittingly appropriate to the M4 postcode of the NOMA Innovation District (see section 4.2.1.1.4) and 'The Federation' co-working space, where the project was physically based, envisaged and occupied a conceptual fourth 'space' which exists between the three fixed points of 'thinking', 'doing' and 'feeling'.

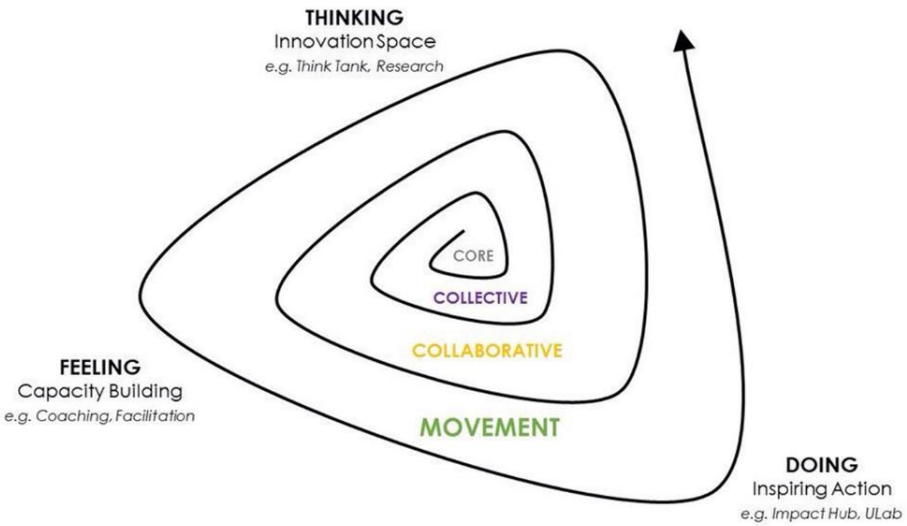
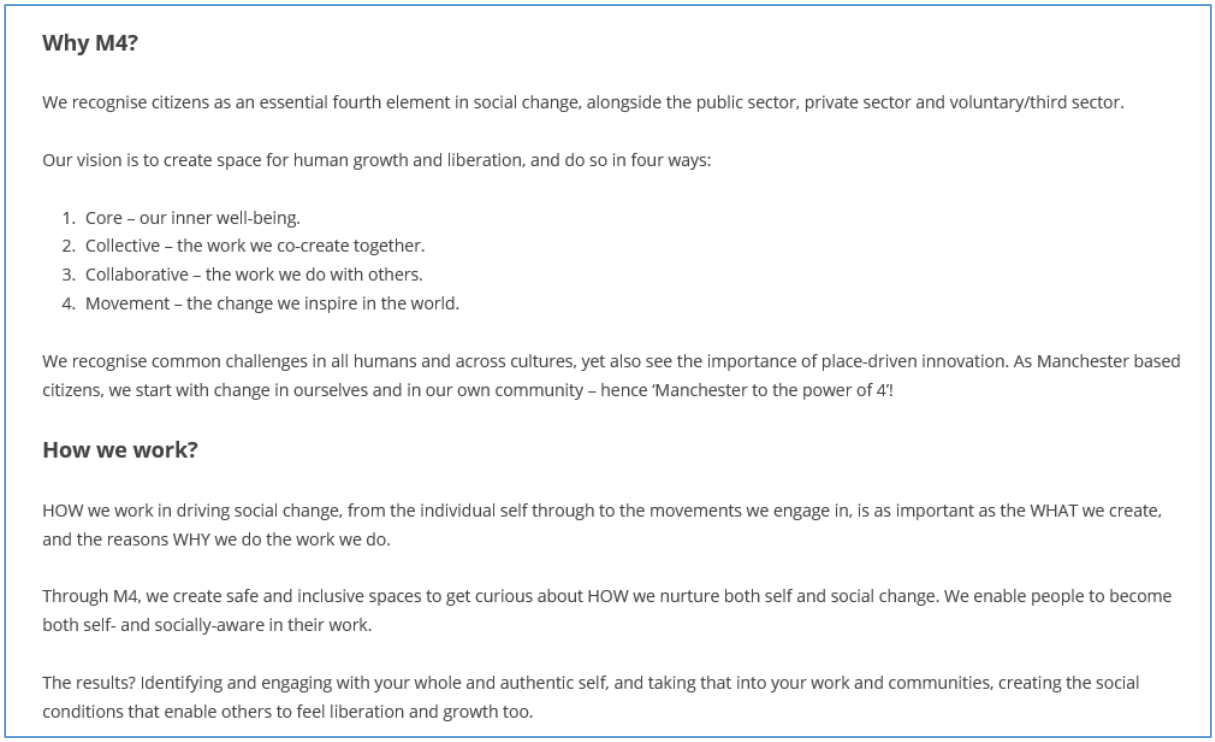


Figure 4.91: The M4 model

M4 activity, as also shown in Figure 4.91, was envisaged as operating across four levels – 'core', focussed on the individual; 'collective' – focussed on work under the M4 banner, 'collaborative' – focussed on work with other partners and projects, and 'movement' focussed on outward looking, communication and campaigning activity. The four layers also correspond to focal points for individual contribution – to the self, to others, to the city, and to the city-region (of Greater Manchester).

Figure 4.92: M4 project – manchester4.uk website home page (Source: manchester4.uk)



Why M4?

We recognise citizens as an essential fourth element in social change, alongside the public sector, private sector and voluntary/third sector.

Our vision is to create space for human growth and liberation, and do so in four ways:

1. Core – our inner well-being.
2. Collective – the work we co-create together.
3. Collaborative – the work we do with others.
4. Movement – the change we inspire in the world.

We recognise common challenges in all humans and across cultures, yet also see the importance of place-driven innovation. As Manchester based citizens, we start with change in ourselves and in our own community – hence 'Manchester to the power of 4'!

How we work?

HOW we work in driving social change, from the individual self through to the movements we engage in, is as important as the WHAT we create, and the reasons WHY we do the work we do.

Through M4, we create safe and inclusive spaces to get curious about HOW we nurture both self and social change. We enable people to become both self- and socially-aware in their work.

The results? Identifying and engaging with your whole and authentic self, and taking that into your work and communities, creating the social conditions that enable others to feel liberation and growth too.

Figure 4.93: M4 co-created vision and values (manchester4.uk)

The primary focus of the M4 programme was to engage citizens from across GM, some experiencing significant levels of marginalisation and/or disenfranchisement, as contributors to the civic consciousness and in civic initiatives, working through M4 as an organic and distinctly citizen-led 'civic innovation' space. M4 activity included the 'Whole Self City' initiative, exploring and establishing routes for individuals to contribute to the GM Mayoral agenda, resulting in the '#4thingsforGM' campaign (Figure 4.63).

Figure 4.94: M4 #4thingsforGM Campaign

The M4 platform also included an interconnected capacity building, research and impact evaluation programme working with three selected citizen communities of interest and experience, namely GM's skateboarding community (through skateboarding group Projekts Mcr), the 'DivaManc' women's representation initiative (a campaign established during the 2017 GM Mayoral election to address the disenfranchisement of women in devolution agenda, affiliated to the 'Our GM' consultation platform) and GM citizens with current or former 'lived experience' of homelessness (through leading homelessness charity, Street Support). Working alongside these citizen groups, three projects were supported through the M4 platform, broadly correlated to the three axes of the 'Sustainable Innovation Wheel' (spatial, cultural and social) and under the overarching theme of 'The Streets':

- A group of ten young people (18-24) from Projekts Mcr carried out topographical research in the city centre of Manchester using GPS (Global Positioning System)

markers and bodycam footage to explore ‘The Streets’ from a skateboarder’s perspective.

- Ten members of ‘DivaManc’ women’s representation initiative were engaged in a one-day exploration of Manchester involving a number of facilitated street-based investigatory exercises, reporting qualitative feedback as a subjective, gendered experience of the city.
- Ten citizens with current and former lived experience of homelessness were engaged in M4 through the Street Support initiative a leading GM anti-homelessness campaign and the GM Homelessness Action Network. Participants collected audio recordings of their experiences under the banner of ‘The Sounds of the Streets’. Material generated through this part of the M4 programme went on to feature in the ‘International Arts and Homelessness Festival’ exhibition in November 2018, the International Sonic Arts Forum 2019 and the Liverpool Light Night Festival 2020 (hosted online due to COVID restrictions)

Figure 4.95: M4 Planning Sessions for ‘The Sounds of the Streets’ project (Source: manchester4.uk)

4.6.1 – M4 ‘The Streets’ Project Evaluation – ‘SI Wheel’ Scoring

The thirty participants engaged in the ‘The Streets’ suite of projects, drawn from communities of interest outlined above and taking part in the projects as part of the M4 action research programme, were asked to give a score out of ten to indicate their subjective ‘wellbeing’ and a further score out of ten relating to a particular aspect of their personal ‘lived’ experience of

Greater Manchester as a place. Participants from Projekts Mcr were asked to attribute a score out of ten in regard to 'spatial' experience. Participants from DivaManc were asked to attribute a score out of ten in regard to 'social' experience. Participants from 'The Sounds of the Streets' project were asked to attribute a score out of ten in regard to 'cultural' experience. The exercise was carried out at the commencement and end of each project in turn, to allow for comparative results.

The average wellbeing score from across the three communities of interest was added to the attributed scores in terms of 'social', 'cultural' experience to give a total 'SI Wheel' score. Results are shown in Table 4.5.

In each case, and across all scores, scores given after engagement in the project showed a marked improvement on scores given before engagement in the project. The total score pre-engagement in the project was 49.75 and the total score post-engagement was 80 (which can also be expressed as a percentage).

PRE/POST PROJECT:	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	TOTALS	
PARTICIPANT:	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	PRE	POST
PROJEKTS MCR																						
WELLBEING	6	8	4	6	6	8	5	8	4	6	3	7	7	9	3	7	4	8	5	9	47	76
SPATIAL	7	9	6	8	5	8	6	9	5	7	4	8	5	8	4	8	5	9	5	9	52	83
DIVAMANC																						
WELLBEING	6	9	7	9	6	8	6	9	4	7	5	8	5	8	4	9	7	9	6	9	56	85
SOCIAL	5	7	4	8	5	8	6	8	4	9	6	8	4	9	5	9	6	9	3	5	48	80
SOUNDS of the STREETS																						
WELLBEING	4	6	5	7	4	6	5	5	6	8	7	9	3	6	2	8	4	7	4	9	44	71
CULTURAL	5	8	6	9	5	8	6	8	7	9	5	8	3	8	3	8	5	9	5	8	50	83
			PRE	POST																		
Average Wellbeing Score:			49	77																		
Total Spatial/Social/Cultural Scores:			150	243																		
Total Score:			199	320	out of	400																
SI WHEEL SCORE			49.75%	80%																		

Table 4.5: M4 'The Streets' Project – 'SI Wheel' Scoring

4.6.2 M4 – Delphi results

A Delphi exercise was undertaken featuring ten anonymous panellists, including one panellist each (totalling three) representing the three citizen groups of interest (Projekts Mcr, DivaManc and Street Support) engaged in 'The Streets' projects. Seven panellists were engaged from the core M4 stakeholder group. Questionnaires were completed during one-to-one semi structured

interviews. Two rounds of questionnaires were undertaken, with a feedback session held in between each round. Questionnaires for the first round were completed on 1st and 15th May 2017, with a feedback session hosted on 8th May 2017. Questionnaires for the second round were completed on 7th and 21st May 2018, with a feedback session hosted on 14th May 2018. Results were collected by hand on hard copy of the questionnaire, then transcribed into a single Microsoft Excel spreadsheet for ease of cross-referencing and comparator analysis. Results of note in terms of particularly strong or weak results or particular relevance to the research questions are presented in the following sub-sections. Full Delphi results can be found in Appendix iv (raw data, mean figures and percentages).

4.6.2.1 M4 Delphi - Respondent Profiles

Five of the Delphi panellists (50%) identified as Founders/Directors, three (30%) as Other and two (20%) as Freelancers. 30% of panellists self-described as representing start-ups, 30% as not for profits, 20% as SMEs and 10% each for company and consultancy. 30% of panellists worked in the IT sector and 20% in Culture/Arts. The strongest response in terms of target reach was city-region with 40%, followed by city-wide with 30%. Profiling results are summarised in Figure 4.96.

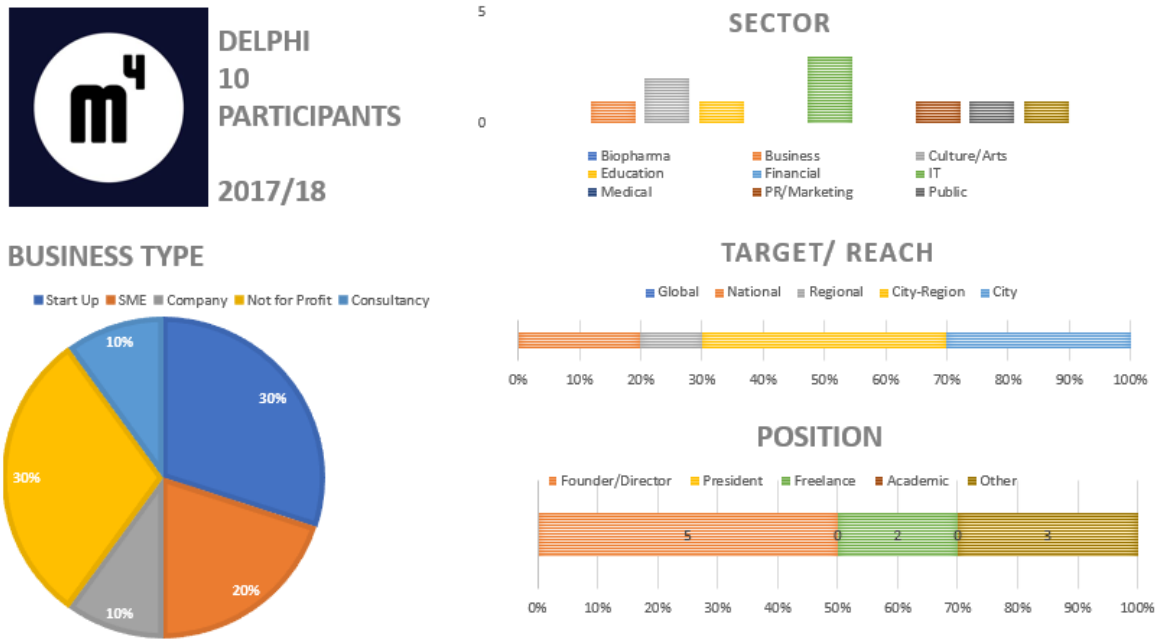


Figure 4.96: Profile information of Delphi panellists

4.6.2.2 The Innovation District

Start-ups and networks/collaboration were identified by panellists in both rounds of Delphi (May 2017 and May 2018) as key to making the NOMA area an 'innovation district' (Figure 4.66). Manchester's Northern Quarter, where the NOMA area is located, is renowned as a focal point for the city's industrial heritage, urban culture and street art, and across both years, panellists identified the area's cultural offer as a key factor in the decision to locate their businesses in the area (Figure 4.97).

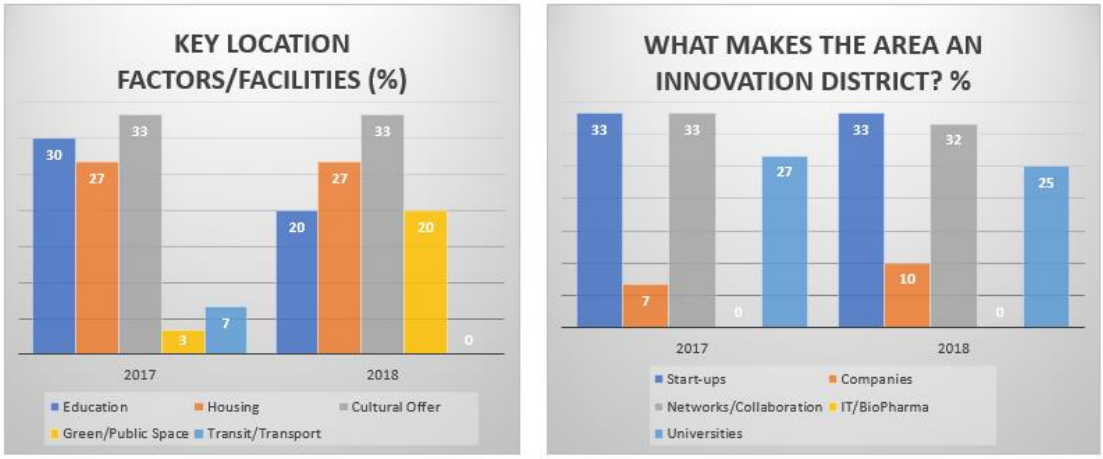


Figure 4.97: M4 'Delphi' Responses – Innovation District

In terms of the area's distinct identity, responses in 2017 reflected the Northern Quarter's 'café culture', with 33% of panellists noting cafés/retail as key contributors to how that identity is manifest, and 30% noting the 'start-up scene'. By 2018, the picture had changed somewhat, with just 17% (almost half) of respondents noting cafés/retail as contributing factors and a significant growth instead in arts/culture (from 3% in 2017 to 18% in 2018) and social connections (from 7% in 2017 to 20% in 2018) (Figure 4.98).

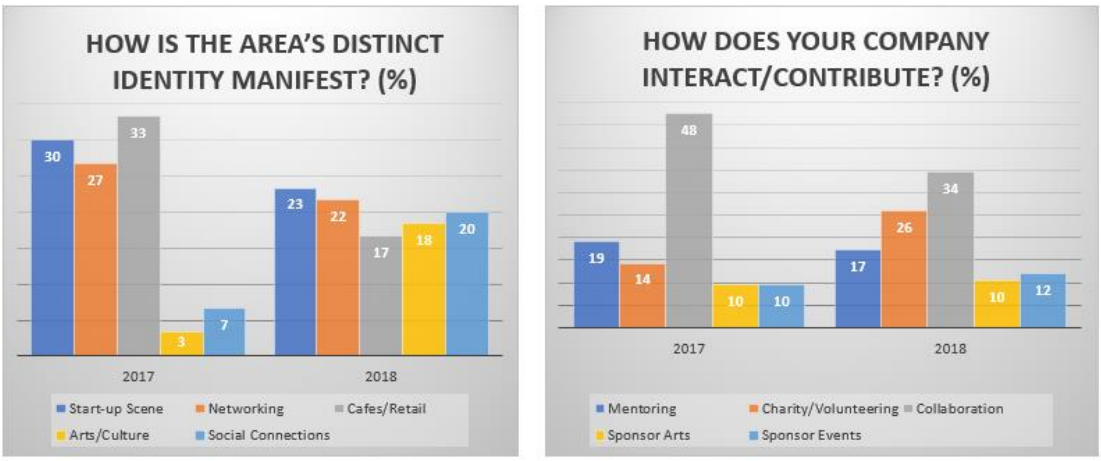


Figure 4.98: M4 'Delphi' Responses – Identity and Contribution

Nearly half of the panellists (48%) noted 'Collaboration' in 2017 as a way in which their company contributes to NOMA's identity as an innovation district. This had dropped by 2018 to 24%, with a rise instead in 'Charity/Volunteering' (from 14% in 2017, to 26% in 2018) (Figure 4.98).

4.6.2.3 Innovation – Production, Use and Measurement

Thirty-five percent of panellists in 2017 described their company's production and use of innovation as primarily in support, with an otherwise fairly evenly mixed profile between product, process and design. By 2018, although 'Support' was still the strongest response (at 33%), there was a stronger showing for 'process' innovation (24%, from 19% in 2017). The highest percentage of respondents (27% in both years) favoured product/process improvements as a means to measure innovation production and use (Figure 4.99).

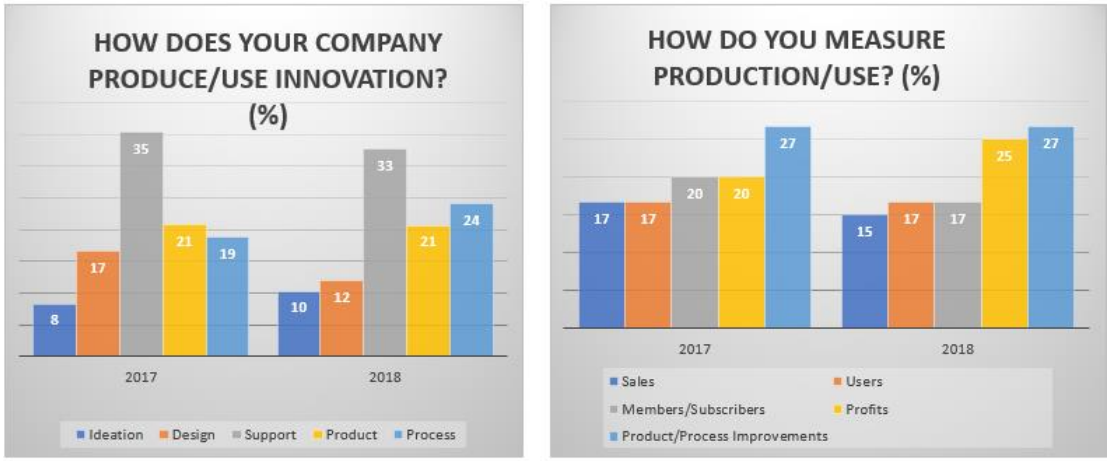


Figure 4.99: M4 'Delphi' Responses – Innovation Production, Use & Measurement

4.6.2.4 Connectivity and Interaction

While panellists across both years identified 'the citizenry' as the key players for supporting a successful innovation district, the mean raw data score fell one point from 8 in 2017 (27% as a mean percentage) to 7 in 2018 (23% as a mean percentage). The response in support of the public sector also fell, from 22% in 2017 to 17% in 2018. Gains were made primarily in support of 'third sector' and 'academic' actors, both moving from 17% in 2017 to 22% in 2018 (Figure 4.100).

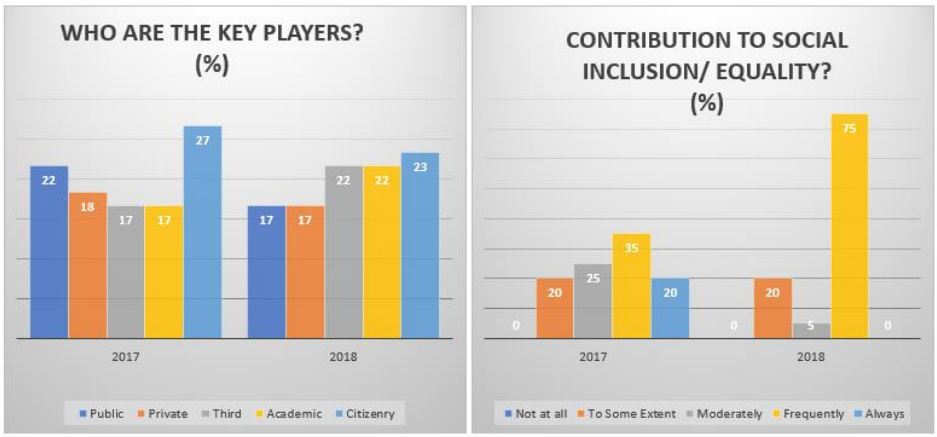


Figure 4.100: M4 'Delphi' Responses – Key Players and Inclusion/Equality

One hundred percent of respondents in both years noted infrastructural and environmental connectivity as 'very important' or 'critical' to supporting innovation (though the percentage

share changed from 60/40 in 2017 to 55/45 in 2018). Despite this, no companies felt engaged 'to a large extent' or 'fully', with the largest response for 'to some extent' in 2017 (55%), improving to 'moderately' (65%) in 2018 (Figure 4.101). There was a significant shift across the year in the level of interaction with other companies moving from only 40% of panellists responding "often" in 2017, to 75% 'often' in 2018. (Figure 4.101)

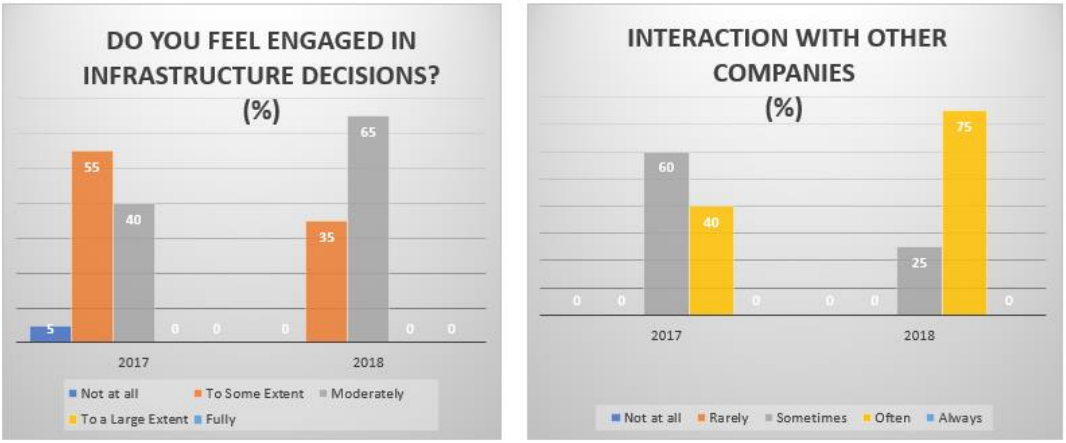


Figure 4.101: M4 'Delphi' Responses – Infrastructure and Interaction

4.6.2.5 Gaps and Challenges

In terms of gaps, challenges or threats to the innovation ecosystem, panellists pointed across both years to a lack of green/public space, transport issues and unaffordability of housing as the key current and emerging issues. A slight drop in concern around transport issues (30% to 27%) by 2018 was balanced with a slight rise in concern around a lack of cultural facilities (from 5 to 7%), but concern around green space and housing continued to dominate (Figure 4.102).

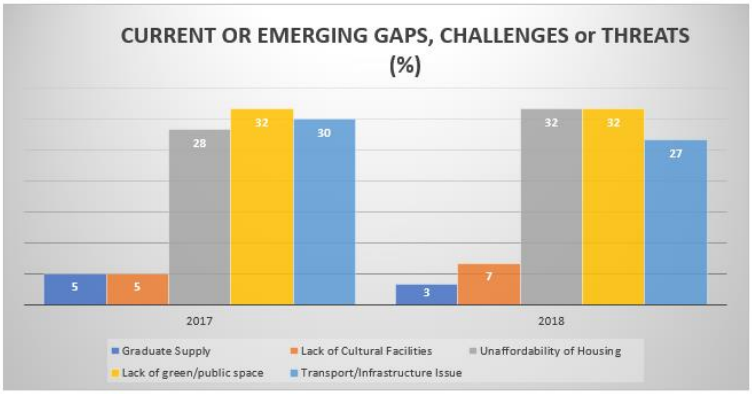


Figure 4.102: M4 'Delphi' Responses – Gaps, Challenges or Threats

4.6.3 M4 Interviews - Coding Results

The deductive coding strategy used in previous analysis was repeated as the basis for word frequency analysis of semi-structured interviews undertaken as part of the Delphi exercise, performing a word frequency search in relation to twenty selected key words. The 'top 5' words used in the semi-structured interviews undertaken as part of the Delphi exercise in May 2017, from within the twenty key word terms and in order of weighted percentage, were 'innovation', 'social', 'housing', 'community', 'place' and in May 2018, were 'innovation', 'place', 'sustainable', 'community' and 'space' Both sets of results are shown in Table 4.6.

KEY WORD	M4 DELPHI 2017	M4 DELPHI 2018
INNOVATION	0.093	0.072
PLACE	0.059	0.068
EMBEDDED	0.007	0.002
SUSTAINABLE	0.035	0.061
CULTURE	0.041	0.035
HERITAGE	0.050	0.032
HISTORY	0.002	0.008
ART	0.031	0.037
SPACE	0.039	0.052
SOCIAL	0.081	0.045
NETWORK	0.029	0.038
ECONOMY	0.036	0.035
COMMUNITY	0.061	0.059
HOUSING	0.073	0.041
DIVERSITY	0.038	0.037

Table 4.6: M4 Delphi – Key Word Frequency Results- May 2017 and May 2018 (weighted %)

A secondary word frequency analysis was performed to establish the ‘top 5’ words used in the M4 Delphi exercise interviews from outside of the selected key word search terms. Words featuring in the ‘Top 5’ from case study searches were also excluded from the search. The ‘top 5’ words used, in order of weighted percentage frequency, in May 2017 were ‘collective’, ‘property’, ‘mayor’, ‘progress’ and ‘forward’. In May 2018, the ‘top 5’ words on the same basis were ‘development’, ‘self’, ‘time’, ‘change’ and ‘care’.

4.6.4 M4 ‘SI Wheel’ Evaluation Feedback

As part of the ‘Evaluation’ and early ‘Communication’ stages of the ‘Design Science Method’ framework (see Sections 3.3.3.2.5 and 3.3.3.2.6), the ten panellists engaged in the Delphi exercise carried out as part of the ‘M4 action research project’ were asked during the first round of semi-structured interviews, held in May 2017, to give informal qualitative commentary and feedback on the developing ‘SI Wheel’ prototype tool. Panellists were given, for reference, a copy of the diagrammatic representation of Hevner and Prat’s evaluation framework (Hevner & Prat, 2017, Figure 4.72; see Section 3.3.3.2.6).

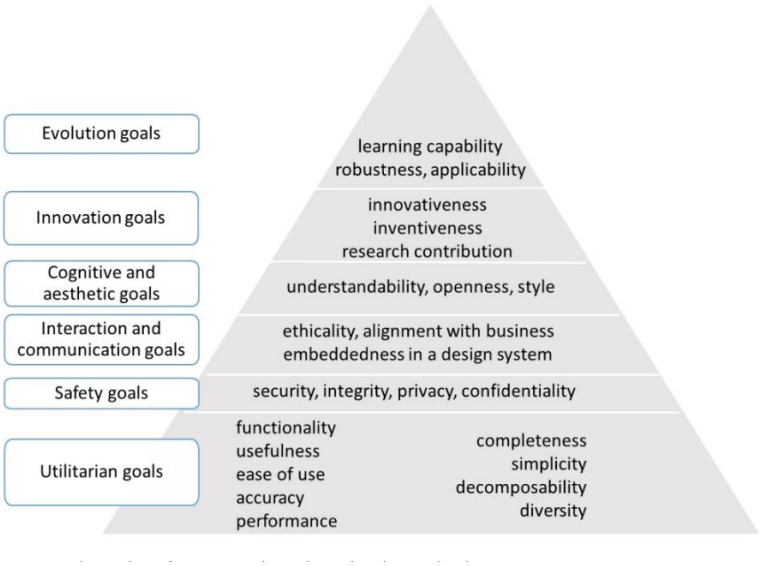


Figure 4.103: Evaluation framework used as reference for M4 ‘SI Wheel’ feedback (Source: Hevner & Prat, 2017)

Feedback was overall positive in terms of the baseline framework ‘Utilitarian Goals’. Panellists described the SI wheel as “simple, but effective”, “beautiful in its simplicity” and “universally

understandable". Similarly, feedback was positive in terms of "Cognitive and Aesthetic Goals" with one panellist praising the "clear design process" resulting in a "user-friendly design".

Panellists noted the innovativeness of the tool and welcomed the test proposition to use experience-led metrics in application to the SI wheel's 'social', 'environmental' and 'spatial' indicators for 'place'. One panellist raised that working with the public to draw out their 'lived experience' of a place within these themes would almost certainly generate ethical and security/confidentiality needs in terms of data protection (particularly in terms of eliciting the experiences of vulnerable people). Reflecting a comment from one panellist that "the tool is only as good as the data", a number of panellists noted the importance of *who* might be engaged in the collection of data, both in terms of a representative sample and in terms of collecting and processing data. "Council performance evaluations always have Manchester coming out on top", one panellist observed. Another panellist raised the idea of working with a 'Citizens Jury' as a reference panel/sample group.

In terms of 'Evolution Goals', panellists felt that the tool could be developed in order to incorporate "mission thinking" (see Section 2.9) and to respond to emerging proposals around economic systems such as Raworth's 'Doughnut Economics' (2017; see Section 2.9). Panellists welcome the test proposition to incorporate New Economics Foundation (NEF)'s 'Five Ways to Wellbeing' ('Connect, Be Active, Give, Take Notice and Keep Learning' - NEF, 2008) as a counterpoint reference to the experiential 'place' indicators and as a way to demonstrate connections between individual wellbeing to place. Panellists also welcomed the test proposition to incorporate the United Nations' seventeen Sustainable Development Goals (from 'Transforming our world: the 2030 Agenda for Sustainable Development', UNDP 2015) within the tool, again as a counterpoint to the experiential indicators of place, but in this case to demonstrate the connections between place and global goals and challenges, principally sustainability.

4.7 Directional Flow

Observations made and data gathered through the 'M4' action research project, the Delphi analysis and the associated semi-structured interviews has informed a novel proposition related to the nature of spatial flows. This has been informed in particular by an emerging sense of a directionality attached to the innovation process observed, for example, in the high frequency of the words 'progress' and 'forward' in the May 2017 Delphi content analysis results (and as

arguably demonstrated by, for example, the UK Government's post-COVID strategy to 'Build Back Better'). Three types of spatiotemporal value flow are identified by Harvey (2017) - linear, cyclical and capital (downward spiral). Feedback regarding directionality for the conceptual 'how' in terms of how a distinctly place-*driven* innovation is manifest asserts a fourth type of spatial flow, characterised as an 'upward spiral' and presented here as new knowledge (Figure 4.104).

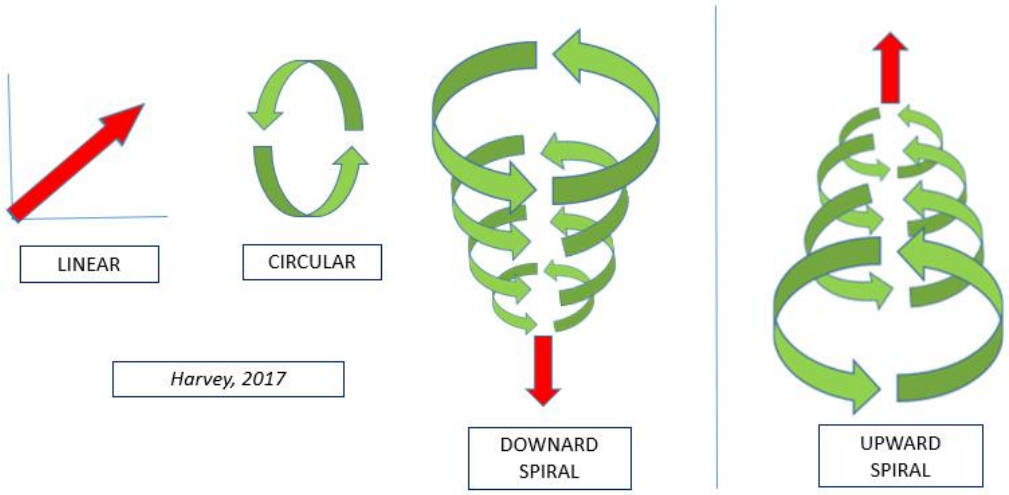


Fig 4.104: The 'Upward Spiral' spatiotemporal flow

4.8 Civic Investment Value index (CIV4.0*)*

Drawing on the results of the 'M4' action research project and expert and participant commentary and feedback on 'SI Wheel' prototype, the Civic Investment Value index (CIV4.0) builds on the 'SI Wheel' to create an extended prototype evaluation tool, which not only integrates place-related experiential performance measures, but which also incorporates established measures related to individual wellbeing indicators and global sustainability goals.

The CIV4.0 tool prototype incorporates the 'Sustainable Innovation Wheel' as a foundational base with the additional incorporation of the United Nation's 17 Sustainable Development Goals (SDGs) (from 'Transforming our world: the 2030 Agenda for Sustainable Development', UNDP 2015) and the New Economics Foundation (NEF)'s 'Five Ways to Wellbeing' (2008). The SDGs are an integrated set of seventeen 'goals' related to key areas of 'economic, social and environmental progress' (UNDP, 2015) and were adopted by all United Nations Member States in 2015. NEF's 'Five Ways to Wellbeing' is a tool for self-appraisal of individual

wellbeing, introduced as part of its work on the UK Government's Foresight project on Mental Capital and Wellbeing is based on its definition of wellbeing as "feeling good and functioning well" and five key principles: Connect, Be Active, Give, Take Notice and Keep Learning.

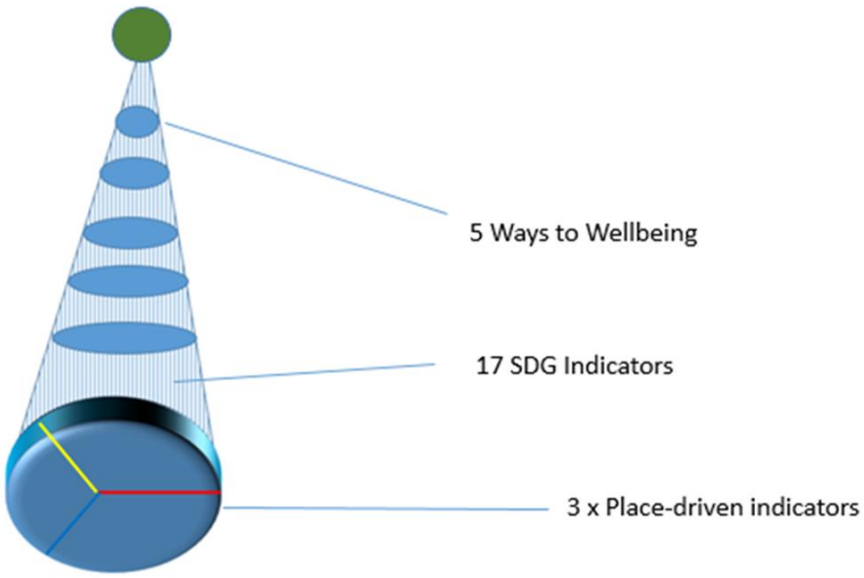


Figure 4.105: The CIV4.0 Cone

The prototype CIV4.0 tool is visualised as a cone (Figure 4.105). The 'goal' of sustainability sits at the top of the cone, with a place's progress towards the SDGs indicated by the extent to which the cone is vertically filled, and the five 'Ways to Wellbeing' indicators incorporated as radials.

An index of measurement, which sits behind 'the cone', is proposed, based on decimal performance measures against whole scores of 1 for each of the 17 SDGS, for each of the 'Sustainable Innovation Wheel' axes related to the social, cultural and spatial experience of place (based on a proposal to gather subjective scores on the experience of a place through, for example, a reference panel of 100 randomly selected citizens), and whole scores of 1 against the five 'Ways to Wellbeing' measurements, making a total score of 25. A multiplier of 4.0 is then applied to the total score of 25, to create an overall score out of 100 as the basis for a weighted percentage performance index.

The index can be adapted to economies of any scale, permitting both comparative performance and assessment of collective progress toward the global SDGs. A series of cones representing the performance of different places can be arranged to form a circular figure (Figure 4.106) which can be used as an easily understood and accessible visual representation of collective performance.

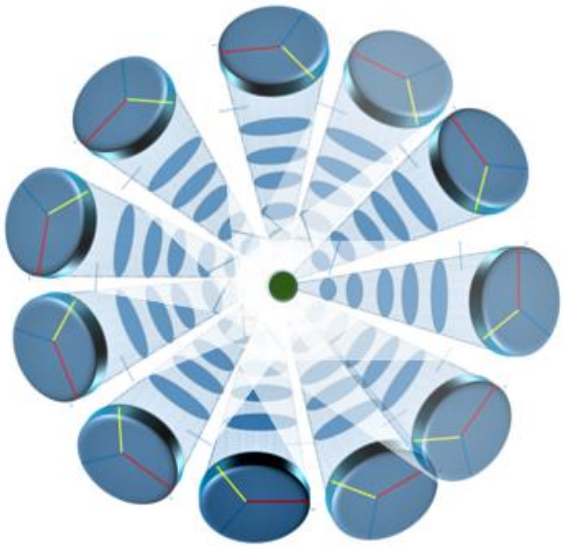


Figure 4.106: Multiple CIV4.0 cones

The proposal for the CIV4.0 index was recognised and published in the 'top 10' entries to the Global Indigo Prize for Economics, 2017.

4.9 Expert Testing – Exploring the 'Why'

A second series of ten semi-structured interviews was undertaken with selected experts working at the forefront of alternative economic modelling, systems design, in current community-led and active citizenship programmes, in 'place' and 'innovation' landscapes, and in the catalytic, interdisciplinary spaces in between. Interviews were designed to test and validate emerging results and findings, and to gather feedback on the CIV4.0 proposals.

It should be noted that this set of expert interviews was conducted during and following the third UK 'lockdown' in response to the COVID-19 pandemic. Of the ten selected experts, two work with a primarily local focus (Liverpool City-region – 'LCR'), two regionally (Manchester

and/or the North West of England), two across the North of England, two nationally (England) and two at a UK/international level. Semi-structured interviews were once again supported by use of the questionnaire (Appendix ii).

4.11.1 Local – The Liverpool City-region – Strength in Diversity

Participant N1, a local business leader in Liverpool, notes in particular the community-led response to the COVID-19 pandemic, across the Liverpool City-region and beyond, enhanced she suspects by the need to 'stay local' driven by the UK 'lockdown' travel restrictions. *"I think the pandemic has brought local communities together in a way not seen since the war years"*, says Participant N1. *"There's been a real power to be had in that groundswell of deep connection and just looking after each other. More than anything, I think it has elevated care as being absolutely integral to our social and economic fabric*" (Zoom interview, 5th January 2021). Participant N1 notes, however, that the increased 'care' responsibilities resulting from the pandemic, and specifically the need to 'work from home' may have had a disproportionate effect on women, observing that: "*It has been difficult for professional women who have won so many battles in the office to now be fighting those same battles from the 'home-front'. We know that women do the vast share of domestic chores and many are schooling children at home, as well as looking after vulnerable or isolated parents and older family members, as well as running their businesses and work lives*." Participant N1 asserts that there have been a number of positive impacts from the 'lockdowns', notably the removal of the commute from daily life ("*just seems like such a waste of time now*") and the opportunity afforded by 'The Great Pause' to "*box off those projects that we haven't had time to do in the past*". She points to three projects that have emerged during the pandemic and subsequent lockdowns as "potential gamechangers" for the Liverpool City-region's economic recovery: "*We have established Kindred as a collective body for our creative and social enterprises, who together are worth nearly £3billion to our economy and employ over 50,000 people. We've launched the One Day women's economy forum which is campaigning for a gender-balanced economy and more female representation on our leadership boards, and we're about to launch the Nia Black Business Hub for start-up businesses led by black women and women of colour*" (Zoom interview, 5th January 2021).

Participant O1, an elected representative for the Liverpool City-region, agrees that "*Diversity can drive our city-region's recovery*", adding "*and not just the diversity of our people, but of*

our skills and talent pipeline, our sectoral strengths, our natural and cultural assets" (Zoom interview, 13th January 2021). The Liverpool City-region launched its economic recovery plan in July 2020, built around four strategic themes – a people-focused recovery, place, the business ecosystem and a green recovery – and proposing an £8.8bn programme of forty 'shovel ready' projects including The Mersey Tidal Power project (harnessing the hydroelectric generation power of the River Mersey), Shakespeare's North Playhouse (a sister project to The Globe, set to open in Prescot, Knowsley in 2022, Glass Futures, an advanced glass manufacturing centre set for St. Helens and the LCR Hydrogen Economy Programme, a proposal to replace the LCR's public buses with a hydrogen powered fleet, starting with the Halton district (LCR, 2020). "*Our plan is people focussed and we have prioritised jobs and skills, and the targeted support people need to bounce back from this. We're talking over 120,000 jobs safeguarded or newly created. Immediately before the pandemic, our city region was the most productive in the North and we outpaced the country in terms of regional growth. We are not naïve about the challenges facing us, especially of course around unemployment and health, but we are a city that has massive natural and cultural assets, and our greatest asset is our people. Together, we will bounce back."* (Participant O1, Zoom interview, 5th January 2021).

4.11.2 Manchester and the North West: Culture and Innovation

"The COVID-19 pandemic has meant that digital health has become more important than ever before", says Participant P1, a senior leader with GM LEP, *"especially in supporting people who can no longer access physical GP and hospital appointments. I think in Greater Manchester, we really felt the benefits of our devolved health and social care system and of the efforts and achievements we have collaboratively been making in health innovation for years, like the GM Care Record and all the rich health data we already hold – that came into its own pretty much overnight"* (Zoom interview, 15th January 2021). Innovation is the focus of the Greater Manchester Economic Recovery Plan. Titled 'Innovate GM' and led by the Greater Manchester Local Enterprise Partnership (GMLEP), the plan launched in November 2020. "*We have a well-established heritage in social innovation and in using that strength of innovation to drive social change. The pandemic has brought home crystal-clear that even though we have achieved so much over the last twenty years, our economy just isn't working for everyone. We need to make sure that everyone benefits from our collective success*" (Zoom interview, 15th January 2021). 'Innovate GM' sets out the GMLEP's plans to establish innovation districts in

every borough of Greater Manchester, supported by a 'Talent City Region' programme which will see businesses link up with education providers at all levels as what Participant P1 calls a "place-based talent pipeline", a 'Good Employment Charter' and investment in low-carbon infrastructure across GM through a proposed GM Infrastructure Programme. Notably, the plan was co-designed by Imperative 21, a 'global campaign to reset capitalism' (GMLEP, 2020; Imperative 21, 2021).

"*Collaboration has always been at the heart of Greater Manchester's success*", says Participant P1, "*and none more so than our collaboration across borough boundaries. We plan to create a network of innovation districts across GM to support health, digital, clean technologies and advanced manufacturing as our frontier sectors, to bring the collective R&D strengths of our four universities together and to ensure that there are opportunities for all of our citizens to benefit from growth in these sectors, to reach their full potential and even to find a green job for life*". (Zoom interview, 5th January 2021).

The COVID-19 pandemic and associated 'lockdown' restrictions has impacted heavily on the UK cultural and tourism sectors. Pre-pandemic, the cultural sector contributed £15billion to the North West region's GVA (ACE, 2019), including £5billion from overnight stays. The region, which not only includes the urban and cultural metropolitan centres of Liverpool and Manchester, but also the more rural Cumbria region with The Lake District at its centre, saw a 45% reduction in GVA over 2020 (ONS, 2021), 70% of its cultural sector workers 'furloughed' (ACE, 2020) and regional hotel occupancy fall to 17% at the height of the pandemic (ACE, 2020). "*Our cultural sector is the heart and soul of our regional economy*", says Participant Q1, a senior LEP leader. "*Our cities have world-class culture and heritage offers, and our natural landscapes are nationally and internationally renowned. We have been badly hit by the pandemic and are doing everything we can to ensure that we can support our creative talent and cultural assets in a quick and sustainable recovery"* (Zoom interview, 19th January 2021). The Liverpool City-region (which was also a pilot city-region for mass-testing in Spring, 2020) has been chosen as a pilot area within the UK's Government's Events Research Programme (ERP), a national research programme designed to trial the return of large-scale events. The Liverpool City-region pilot will start with an outdoor festival of light installations, 'The River of Light', in March 2021. "*Liverpool is an event city*", says Participant Q1, "*We are famed for our music and our sport and our large-scale cultural events, but also for our people and communities. We are hardwired for social and cultural pursuits and have an inbuilt need for connection with others. Bringing back our events programme and re-opening our galleries*

and museums and other cultural assets as soon as is safely possible is critical not just for our economy, but for our collective wellbeing" (Zoom interview, 19th January 2021).

4.11.3 The North of England: Levelling Up

The 'North-South Divide' is a long-established phenomenon in England's economic geography, marked by relatively poor performance in the North of England across a whole range of economic indicators, including a notable 'early years gap' with a 12 point percentage difference between learning attainment at age 5 between London and the North (59% and 47% respectively, IPPR 2019), a 10.8% gap in average productivity (IPPR, 2019) and a difference in life expectancy between the lowest in the North and highest in the South of 18.9 years (ONS, 2019). The pandemic has exacerbated many of these disparities, with an additional 57.7 deaths per 1,000 deaths in the North of England compared to the South (NHSA, 2020). At the same time, the North of England has historically suffered from chronic and comparative underinvestment, a trend which continues according to IPPR (Institute for Public Policy Research), whose 2020 report 'The Science-based Economy' finds a £4billion disparity between investment in health innovation R&D between the North and the South, just £22 per capita as compared to £56 per capita in London (IPPR, 2020). Various political efforts have been made in attempts to re-balance this disparity, notably 'The Northern Powerhouse' programme, led by former UK Chancellor George Osborne during his tenure with David Cameron's coalition and Conservative governments (2010-16) and current Prime Minister Johnson's 'Levelling Up' agenda.

'The People's Powerhouse' was founded in 2017, initially in response to the notable lack of female representation on expert panels at a 'Northern Powerhouse' conference held in Manchester in February 2017. It has since grown to become recognised as a representative voice for people and communities across the North, operating as a "collective movement which exists to shape the debate around the Northern Powerhouse, to ensure that people and communities are at the heart of the Powerhouse plans" (People's Powerhouse, 2021). "*We see ourselves as the northern resistance",* says Participant R1. "*The Northern Powerhouse brand was something pushed onto us by George Osborne which defines us from the view of the South. It has never really resonated with people and communities up here, and that includes business communities. We wanted to capture the tremendous spirit of what is going on at the grassroots of the North and to work alongside our regional Mayors to set out our case with strength and*

pride and to serve as a distinctive and authentic northern voice" (Zoom interview, 22nd January 2021).

"*It's not enough for these programmes to have a general desire to 'level up'*", says Participant S1, a senior executive working across the 'Northern Powerhouse'. "We have to see significant devolvement of money and powers if we are going to effect change in the economic geography of our country" (Zoom interview, 6th January 2021). Referring to current Chancellor Rishi Sunak's Spring 2021 budget (March 2021), Participant S1 says "*there is little in there that will bring real change. We have seen regional and industrial strategies scrapped when so many of our cities and towns put significant resources into crafting them, with no indication of what comes next, with a lip-service to 'levelling up' but huge investment in the Oxford-Cambridge-London triangle*", adding that "*All of the budgets that matter remain in central control. The government wants to invest in infrastructure, innovation and R&D, but we won't see any real change until it bites the bullet and invests in local government and public services*" (Zoom interview, 6th January 2021).

4.11.4 National: Anchor-y in the UK

The 'Community Wealth Building' movement has gained significant traction in the UK over the last three-years, spearheaded by Manchester-based 'think and do tank', the Centre for Local Economic Strategies (CLES). The programme builds on a principle developed by The Democracy Collaborative, a socially engaged think tank based in Boston, USA. Following a successful UK pilot as 'The Preston Model', a long-term development plan initiated by Preston City Council (working with CLES) in 2011 which has since seen £112.3m retained in the local economy, a 'real living wage' rolled-out to an additional 4,000 employees in the city (CLES, 2019) and Preston awarded 'Most Improved City' in the UK Good Growth for Cities guide 2018, the programme has since been rolled out to a number of other cities and regions across the UK including Birmingham, Lewes, Wirral and North Ayrshire and latterly finding scale with Scotland's adoption of a national Community Wealth Building strategy in 2020. The model seeks to minimise extraction from local economies by working with 'anchor institutions' such as universities, councils, schools and hospitals, to direct procurement, investment and employment opportunities toward the local area.

"*Community wealth is all about stopping the leaks before they start - and that includes leakages of funding, profits, people, talent and opportunity – and making sure that places can prioritise*

providing for their own people, rather than servicing the needs of faceless external shareholders", says Participant T1, a local business leader (Zoom interview, 14th January 2021). "*The late nineties' obsession with 'agglomeration economies' has done nothing but price out local people and corrode our urban cultures. We have been so focussed on skylines and skyscrapers that we haven't noticed what is happening on and to our streets or the shocking number of people sleeping in doorways. Community wealth is a recognition that trickle down is never going to happen. It is about pre-distribution, utilising the massive spending power of local 'anchors' to ensure the lion's share of wealth is locked into the locale".* (Zoom interview, 14th January 2021).

Participant U1, a civil servant (speaking independently), shares Participant T1's view that the COVID-19 pandemic and related lockdowns have seen a re-emergence of localised and "ground up" economic approaches. Instead of pointing to larger 'anchors' such as universities and hospitals, Participant U1 describes "*a revolution happening on our local high streets. It's been impossible to avoid the gradual decline of our once bustling high streets over the last ten years. So many across the country are marked now by neglect and dereliction and decay. Even pre-pandemic, businesses were closing at pace with trends like online shopping and out-of-town shopping centres contributing to a huge dip in footfall. While this has in many cases been amplified by the pandemic, there is also a notable change in use and focus of the high street away from big retail and chain stores, and toward community and connection, anchored by libraries and community centres and by community-led, independent and social businesses. We are witnessing a real change of purpose in what our High Streets are made for which, to be honest, looks a lot more like what they used to look like. It's a distinctly English take on café culture which is about a chat with your local butcher or baker or florist, a good gab, a fry up and a decent cup of tea"* (Zoom interview, 14th January 2021).

4.11.5 UK/International: Sea port to E-port, Surviving to Thriving

Participant V1, another civil servant, picks up on Participant U1's reference to community libraries, saying that "*There is this obsession with universities building buildings for this research or that theme or that area of study and having 'A.N.Other' sponsor's name attached to them. They are building these things as palaces of knowledge but end up becoming mausoleums. We don't need any more buildings. Our network of local libraries is like a ready-made, locally rooted, nationally distributed innovation campus waiting to happen. They have*

been massively impacted by austerity, disappearing left, right and centre. It's just tragic that we are being systematically stripped of this potentially transformational resource. It was the same with the 'bonfire of the polytechnics' in the 80s and 90s, and now we find ourselves desperately trying to re-establish that connection between universities and industry." (Zoom interview, 15th January 2021).

Participant V1 points to the role of digital and virtual spaces in navigating the needs and challenges of the COVID-19 pandemic creating, he says, "*a deeper connection between the local and the global*". He notes a developing narrative in the Liverpool City-region's place-branding, which he describes as "*from sea-port to e-port*" and a particular characteristic, based on his experience of working in Liverpool, of a grassroots 'innovation' which "*starts with people and their interests, not what you want them to be interested in. If you want to secure sustainability for anything, you need to involve the kids and the schools*". (Zoom interview, 15th January 2021). Now working internationally at a UK-level, Participant V1 says "*the problem with innovation is that it has become a catch-all phrase for everything. It is the catalyst for change at every level. In many ways it has become a victim of its own success because everyone wants a piece of it and now its remit is so broad, it is hard to know what it is. Innovation is eating itself"* (Zoom interview, 15th January 2021).

In some ways responding to this notion of innovation 'mission-creep', Participant W1, a leading academic, advocates for "*mission-oriented innovation, that is collaborating across silos and boundaries and borders and toward a defined shared goal. Clearly the 'shark closest to the boat' is our collective recovery from COVID, so 'the mission' without question now is pure survival. Same goes for climate collapse, which is a tsunami heading our way. The trick will be not falling into survival mode long-term. We need change at pace and depth and scale to make sure we are not just firefighting. We need visionary thinking and a renewed mission focus to make the move from surviving to thriving"* (Zoom interview, 16th January 2021).

4.11.6 Expert Interviews – Coding Results

The deductive coding strategy used in previous analysis was repeated as the basis for word frequency analysis of semi-structured interviews undertaken as part of the second set of expert interviews, performing a word frequency search in relation to fifteen selected key words. The 'top 5' words used from within the fifteen key word terms were 'innovation', 'place',

'economy', 'community' and 'social'. Results and their weighted percentage frequencies are shown in Table 4.7.

KEY WORD	EXPERTS 2
INNOVATION	0.112
PLACE	0.097
EMBEDDED	0.003
SUSTAINABLE	0.079
CULTURE	0.083
HERITAGE	0.078
HISTORY	0.042
ART	0.008
SPACE	0.031
SOCIAL	0.085
NETWORK	0.022
ECONOMY	0.091
COMMUNITY	0.087
HOUSING	0.082
DIVERSITY	0.053

Table 4.7: Expert Interviews – Key Word Frequency Results (weighted %)

A secondary (inductive) word frequency analysis was performed to establish the 'top 5' words used in expert interviews from outside of the selected key word search terms. Words featuring in previous 'Top 5' searches were also excluded from the search. The 'top 5' words used, in order of weighted percentage frequency, were 'lockdown', 'local', 'future', 'power' and 'COVID'.

4.11.7 Expert Feedback on the artefact (CIV4.0)

As part of the 'Evaluation' and 'Communication' stages of the 'Design Science Method' (see sections 3.3.3.2.5 and 3.3.3.2.6), employed in this research as a guiding framework for development of a prototype tool to measure economic performance, the ten experts engaged at this stage of the research were asked through semi-structured interview to give informal qualitative feedback and commentary regarding the 'Civic Investment Value' index (CIV4.0; see Section 4.8). Experts were given, for reference, a copy of the relevant chapter of the 2017

Indigo Prize publication (Indigo Prize, 2017), which includes both a full diagram of the CIV4.0 index (see Section 4.8 and Figure 4.74), relevant contextual and statistical information and developmental background and staged design iterations (including prototype iterations as the 'SI Wheel').

Participant V1 welcomed what they called the "*surface simplicity of a tool that works on meta levels*", observing that "*everything is about the ability to tell stories now. Whether it's getting a job or getting funding or making the case to Governments or proving a concept, what lies at the heart of it is the ability to tell the story and to tell it convincingly. The cone here acts as a receptacle for so many stories. The story of feeling well and connected to place and to each other and to the world*" (Participant V1, Zoom interview, 15th January 2021).

Several of the experts commented positively on the notion of a 'place-driven' model, with Participant S1 noting the "*relevance to the 'Levelling Up' agenda, which at this stage needs to not be about the North or for the North, but loudly and clearly from the North*" (Zoom interview, 6th January 2021) and Participant T1 and U1 noting resonance with what Participant U1 calls a "revolution on our high streets". "*It is good to see that directionality reflected here*", says Participant U1, "*the Government have got it wrong with 'Building Back Better', it is all about moving forward and moving upward*" (Zoom interview, 14th January 2021). Participant T1 observed scope for application of the tool and its 'change in direction' to existing place development models such as 'Community Wealth Building' (CWB; see Section 2,9), saying "*CWB has been accused in some circles of being 'parochial' and 'insular', so it is good to see how we might express it as something that is progressive and outward-facing. We want to be able to make those connections with the good stuff happening on the ground and what we need to be doing as a country and in response to the massive global challenges we're facing now and that are just ahead*" (Participant T1, Zoom interview, 14th January 2021).

A number of experts noted the potential for the prototype tool's application and development in light of the COVID-19 pandemic and associated plans for recovery, welcoming in particular "*the way the 'Five Ways to Wellbeing' are integrated as having economic value. COVID has thrown wellbeing right to the front and centre of all of our minds*", Participant P1, "*For so long so many have been having to make the economic case for wellbeing and it has just been dismissed as hippy, fluffy, tree-hugging crystal waving. Not now. Simply speaking, without health and wellbeing, there is no economy and vice-versa".* (Participant P1, Zoom interview, 15th January 2021).

Participant N1, working primarily at a local level, welcomed the concept of incorporating individual and collective experiential feedback based on lived experience of place (relating to the social, cultural and spatial 'axes' of the base 'SI Wheel'). "*It is good to see the golden threads of how individuals are connected to the economy and to each other. We need to be careful not to lose that connection and community as we set about tackling global challenges or we will end up with people just getting lost in the system, which is basically where we are now*" (Participant N1, 5th January 2021). Participant V1, working primarily internationally, likewise welcomed the "clear connection between individuals and global goals. There's huge potential for it. I would like to see it tested at scale" (Participant V1, Zoom interview, 15th January 2021).

4.12 Results Summary

Results from the case studies strongly correlate with the new taxonomy of place put forward by the research, offering examples of all four levels of expressions of innovation (spatial, commercial, social and holistic) and across all four levels of place integration (place-blind, place-based, place-grounded, place-driven). Importantly for the research, there are clear distinctions between the orchestrated expressions of culture present in the 'third level', 'place-grounded' approaches, such as has been employed in the development of The Fabric District and The Baltic Triangle, and the examples in the case study which demonstrate the 'fourth level' 'place-driven' approach, such as Homebaked CIC, Love Wavertree CIC and Granby Four Streets CLT.

Case study results identify collaborations and networks as essential to innovation processes, with a greater emphasis on human relationships and connections, local and community connectivity emerging in the Liverpool City-region case. Diversity, sustainability and affordability are highlighted as key challenges at the intersect of place and innovation (across all levels). There is evidence in both sets of expert interviews of current and developing efforts to address these challenges. The shift toward localism and community is evident in the overall 'Top 5' word frequency analysis results (as shown in Table 4.8, below).

TOP 5 WORDS	BOSTON	SEATTLE	GM	EXPERTS 1	M4 2017	M4 2018	LCR	EXPERTS 2
(within search terms)								
	INNOVATION	INNOVATION	INNOVATION	INNOVATION	INNOVATION	INNOVATION	INNOVATION	INNOVATION
	SPACE	SOCIAL	PLACE	COMMUNITY	SOCIAL	PLACE	CULTURE	PLACE
	SOCIAL	SPACE	SUSTAINABLE	CULTURE	HOUSING	SUSTAINABLE	COMMUNITY	ECONOMY
	ECONOMY	ECONOMY	SOCIAL	PLACE	COMMUNITY	COMMUNITY	HERITAGE	COMMUNITY
	COMMUNITY	SUSTAINABLE	ECONOMY	SOCIAL	PLACE	SPACE	SPACE	SOCIAL
TOP 5 WORDS	BOSTON	SEATTLE	GM	EXPERTS 1	M4 2017	M4 2018	LCR	EXPERTS 2
(outside of search terms)								
	COMPANY	DATA	CITY	CREATIVE	COLLECTIVE	DEVELOPMENT	MAKING	LOCKDOWN
	GRADUATE	PEOPLE	UNIVERSITY	VIRTUAL	PROPERTY	SELF	YOUNG	LOCAL
	GLOBAL	INVEST	SECTOR	ENERGY	MAYOR	CHANGE	STREET	FUTURE
	CAPITAL	SQUARE	PROBLEM	PARTICIPATION	PROGRESS	TIME	COUNCIL	POWER
	LAND	WELFARE	PARTNERSHIP	FUNDING	FORWARD	CARE	AREA	COVID

Table 4.8: ‘Top 5’ words used (from within and outside of 15 key word search terms)

Based on NVivo word frequency analysis results (weighted %)

5. Analysis and Discussion

5.1 Introduction – What, Who, Where, How and Why?

Foray, whose work has been seminal in the development of the Smart Specialisation concept in both theory and practice (Foray 2014, 2015, 2020), reflects in a recent paper on the importance of the 'bottom-up component of the S3 approach' (Foray et al, 2020) and its centrality to the process of 'entrepreneurial discovery' (the act of finding a new product, purpose, resource or opportunity, as described in Kirzner,1997). This broad base understanding of innovation, both in terms of '**what'** innovation is and '**who'** has licence to innovate is further interrogated in this research, alongside an in-depth exploration of spatial factors and expressions within the place/innovation nexus – the **'where',** with a specific focus on the phenomenon of 'innovation districts'.

A linear flow can be observed in the proposed place taxonomy emerging through the research (which flows from 'place blind' to 'place based' to 'place grounded' and 'place driven'), along with an observable lateral flow through the changing focal points of the word frequency analyses where, over time (and, in the case of the Liverpool City-Region case study and second set of expert interviews, in the wake of a pandemic), there is a distinct shift toward notions of 'place', 'culture' and 'community'. These vertical flows and horizontal shifts together form a framework through which it is possible to conceive of and explore a more fluid and dynamic understanding of both place and innovation, and in doing so to explore and better understand the questions of the '**how**' and the '**why**'.

5.2 From Place-blind to Place-Driven

The research brings forward an emerging taxonomy of approaches related to 'place'. There is an arguably subtle, but individually and cumulatively potent, difference between each level of the taxonomy.

Place-blind approaches have little or no particular resonance or specific relevance to the place in question. The 'place-blind' terminology draws from Ketel's report on Smart Specialisation (S3) for the European Commission, which identifies a trend in S3 development for claimed specialisms in "bandwagon sectors" at the heart of "place-blind interventions" (EC, 2013).

Instead, Ketels calls for an "accent on regional embeddedness" (EC, 2013) and regionally distinct, "**place-based**" approaches to S3 (EC, 2013). This is the naissance of the second typology identified in the place schema: "place-based". This typology is one in which there are observable or recognisable connections with or references to the heritage and characteristics of the place in question, but in which that reference or connectivity remains at a facsimile or superficial level and, being loosely 'based' on the place, could be just as relevant and applicable to any other place.

A third level of place activity, identified through this research as new knowledge, is described in the emerging taxonomy as "place-grounded". Aligned with the 're-imagined urban areas' typology of innovation district (as identified in Katz & Wagner, 2014) and with a deep resonance to the culture of a place, connected through relational dynamics and aligned with the 'quadruple helix' innovation framework, this new typology is proposed as one which is "embedded" (Granovetter, 1985) in the cultural fabric and dynamic of a place, with significant resonance to its unique and distinct cultural practices and place identity. "**Place grounded**" approaches are grounded in the place, are specific to the place in question and cannot be applied or transferred to any other place.

'Place-driven' is presented as a fourth level of place activity, also identified through this research as new knowledge. The key difference between place-grounded approaches and place-driven is in its directionality. While 'place grounded' approaches are deeply embedded in the place, and can result in insularity and parochialism, place-driven approaches present and open, outward and upward dynamic, where progress is driven from the grassroots in contribution to the evolutionary and mission-led, global objectives. This level of place activity transcends borders and boundaries, and as such is envisaged as a holistic model in which all places are encompassed. It is the basis for a new development paradigm presented by this research, which is characterised as "A Fourth Way".

5.3 Place, Innovation and Dynamics

At the core of the research is a perceived tension between the dominant understanding of 'place' as a fixed, bordered spatial territory and/or a fixed, bordered, socio-economic unit and the inherent "dynamic processes" (Rissola et al, 2017) of innovation. The unit of analysis for exploration of this tension through the research is 'innovation districts', bordered, spatial

territories which operate as socio-economic units and which bring place, 'placemaking' and innovation together, described by Katz and Wagner (2014) as:

"geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators and accelerators. They are also physically compact, transit-accessible, and technically wired and offer mixed-use housing, office, and retail. Innovation districts are the manifestation of mega-trends altering the location preferences of people and firms and, in the process, re-conceiving the very link between economy shaping, placemaking and social networking." (Katz & Wagner, 2014)

Applying a case-study boundary of 'city-regions' and informed by the three typologies of innovation identified by Katz and Wagner, 2014: 'anchor-plus', 'urbanized science parks' and 're-imagined urban areas', the research offers a snapshot of how the dynamics of place and innovation interact in Boston/Cambridge (Greater Boston), Seattle (King County) and Greater Manchester. The results not only support the perceived tension between static understandings of place and innovation dynamics, but present a further, related tension in how innovation itself is defined, manifest, produced, used and measured. Mimicking the fixed and bounded predominant understandings of 'place', 'innovation' too has become understood as a product, a noun, a thing, something which can be developed and commercialised in 'innovation labs' and universities in an (increasingly competitive) race to patent. Instead, the research points to innovation as a networked, interactive and dynamic process. This is supported by responses to the surveys undertaken with members of two 'innovation hub' communities, Impact Hub Seattle (July, 2016) and The Federation, Greater Manchester (July 2017), in which most responses identified innovation both in terms of company needs (32% and 26%, respectively) and company production and use (27% and 26%, respectively) as a 'process', in which 80% of respondents in Seattle and 65% of respondents in GM reported levels of interaction with other companies in the area as 'Often' and in which 29% of respondents in both cases noted 'collaboration' as the primary way in which the area's distinct identity as an 'innovation district' is manifest (See Section 4.2.6).

Further dynamism is evident in the profiling of hub members, with 40% of respondents from Impact Hub Seattle and 36% of respondents from The Federation GM identifying as 'Start-ups'. 26% of respondents in GM identified the 'Start-up Scene' as key to the area's social and cultural identity, while 28% of respondents in Seattle note the importance of 'Networking' (See Section 4.2.6). A strong start-up scene is evident too in research undertaken by colleagues from

the MAPS-LED research project team in 2016 which surveyed community members from the Cambridge Innovation Centre (CIC), Kendall Square in Boston/Cambridge (profiled as an exemplar of the 'anchor plus' innovation district typology in this research; see Section 4.2.2.1.1). The survey reports 50% of CIC members as self-identified 'start-ups', with 93.5% of respondents reporting 'regular' interaction with other companies and 56% noting 'networking' as the most important feature of location at the CIC. Interaction with other companies was noted by 40.6% of respondents as 'critical' to knowledge sharing and the generation of new ideas (Bevilacqua, Pizzimenti & Borrello, 2018).

5.4 Networks, Embeddedness and Anchoring

Networks and networking, then, feature prominently in survey responses as a key feature in the dynamics of the case study innovation districts. The word 'network' also features in the top 5 keywords used across the case studies, ranking second only to 'innovation' in all three individually, and overall. The concept of 'social networks' is central to the work of Granovetter, both in relation to his work on strong and weak 'ties' (Granovetter, 1973), through which he explores the social disadvantages to individuals who have no or limited 'weak tie' acquaintance connections beyond their 'strong tie' familial and friendship networks, and which he applies specifically to innovation as resulting in an isolation from "information about problems that need solutions, solutions to problems, and opportunities" (Granovetter, 2005), but also in his work on the dynamics of these social networks, the central tenet of which is his theory of individual economic agency being "embedded in concrete, ongoing systems of social relations" (Granovetter, 1985).

The construct of 'embeddedness' is critical to the place/innovation nexus both in definitions of 'place', as in Rossi's definition of place as "embedding collective memory" (Rossi, 1982), and from an innovation perspective, particularly in the scope of this research in how it is applied to the Smart Specialisation process and its requirement for "an accent on fostering regional embeddedness" (Ketels, 2013). 'Place-based' strategies (as opposed to the a-spatial, 'place-blind' strategies originally conceived for S3; see Ketels, 2013) seek to demonstrate or prove 'embeddedness' in place, that is, a resonance and/or authenticity not present in those strategies which, for example when applied to sector development or industrial strategies, tend to result in claimed specialisms in "bandwagon" (Ketels, 2013) sectors such as digital technologies and bio-sciences. These "bandwagon" sectors tend to be spatially manifest in 'place blind' science

parks, explored in this research through Manchester Science Park and the wider 'Oxford Road Corridor' innovation district in Greater Manchester as a case study (an area which maintains a physical and ideological distance from the city centre, choosing instead to pursue connections to Cheshire and beyond, through what Participant C calls a '*fuzzy boundary*'; see Section 4.2.1.1.1). Ketel's 2013 review of innovation and S3 strategies, in which he explicitly calls for "an accent on fostering regional embeddedness" (Ketels, 2013) has been pivotal in aligning the place and innovation economy agendas, and their symbiotic development, although both standardised, 'one size fits all' innovation policies and claimed S3 specialisms in digital and biotech prevail (see Tödtling & Trippl, 2005). Hassink and Gong (2019) observe a 'delusion' in the selection of specialisms based on "the vested interest groups that need to be incorporated in the … (entrepreneurial discovery) … process" (Hassink & Gong, 2019), citing Grillitsch (2016) who describes the entrepreneurial discovery process as having been 'debased' by "picking winners, rent-seeking behaviour, corruption and lock-ins" (Grillitsch, 2016).

This eschewing of vested interests arguably holds interesting lessons for current 'place-based' economic strategies such as "Community Wealth Building" (Guinan et al, 2020) and, in particular, for the understanding and role of 'anchor institutions'. Emerging from a programme of work around 'community ownership models' by The Democracy Collaborative in the US (see Section 2.9), the Community Wealth Building approach is currently experiencing widespread uptake and adoption by local authorities from across the UK. 'Anchor institutions' are described by the Centre for Local Economic Strategies (CLES), a chief proponent of the Community Wealth Building movement in the UK, as institutions and organisations which "have an important presence in a place, usually through a combination of: being largescale employers, the largest purchasers of goods and services in the locality, controlling large areas of land and/or having relatively fixed assets and/or that are tied to a particular place by their mission, histories, physical assets and local relationships" (CLES, 2017). Examples given by CLES include local authorities, NHS trusts, universities, trade unions, large local businesses and housing associations. There is arguably some resonance between Polanyi's 'institutionally rooted' concept of embeddedness (Becker, 2007) and the way in which Community Wealth Building is currently manifest through these institutional anchors, particularly in the UK where there has been a much stronger focus on the use of procurement and local retention of spend than the 'community ownership' models envisaged by the US original.

Similarly, anchor institutions are central to Katz and Wagner's 'anchor plus' typology of innovation district, conceived of as "where large scale mixed-use development is centered

around major anchor institutions and a rich base of related firms, entrepreneurs and spin-off companies involved in the commercialization of innovation" (Katz & Wagner, 2014). This explicit relationship between 'anchor institutions' and 'commercialization' is explored through the new taxonomy of place proposed through this research (see summary, Table 5.6), aligning academic and large public sector anchors with transactional, free-market behaviours. This represents an important paradigm shift in the manifest of commercial activity, traditionally firmly in the 'private sector' orbit, and the increasingly commercial behaviours of both public sector and academic anchors, traditionally regarded as non-commercial extensions of the state. It is important to note that these behaviours are not universal to all public sector bodies and universities, and particularly that cultural and social systems in heterogenous geographies can influence the degree of commercialisation observed, but there is certainly a prevalence to competition, commercialisation and patent (of knowledge, IP and product), and a shift to 'customer relations' in many institutions and universities in the US, across Europe and the UK.

INNOVATION SPACE	SECTOR	CONSTRUCT	CONCEPT	PLACE
Science Parks	Private	Spatial	Where	Place-blind
Anchor Plus	Public/Academic	Institutional	What	Place-based
Reimagined Urban Areas	Social/3rd	Cultural	Who	Place-grounded
Grassroots	Holistic/4th	Mission-led	How	Place-driven

Table 5.1: A new place taxonomy: The institutional 'anchor plus'

Speaking at the Project for Public Spaces (PPS) Global Conference in Vancouver 2016, Katz describes the reach of the innovation district, in terms of "knowledge sharing" as "a square mile or less" around the central anchor point (PPS, 2016; see Figure 5.1). Although Katz also points to labour market connections of up to forty miles and supply-chain networks of up to one-hundred miles, acknowledgement of these limited and bounded areas of impact and "knowledge sharing" arguably points to an anchor-related 'institutional capture', aligned with Harvey's "fixed capital paradox" in which "the very form of flow designed to liberate capital

therefore ends up directing the flow back into that space*"* (Harvey, 2017), re-asserts the tension between static and fixed ideas of place and innovation dynamics, and emphasises the too-often overlooked implications for what happens beyond those boundaries (referred to - where consideration is given - as 'unintended negative consequences', as in Rissola, 2017).

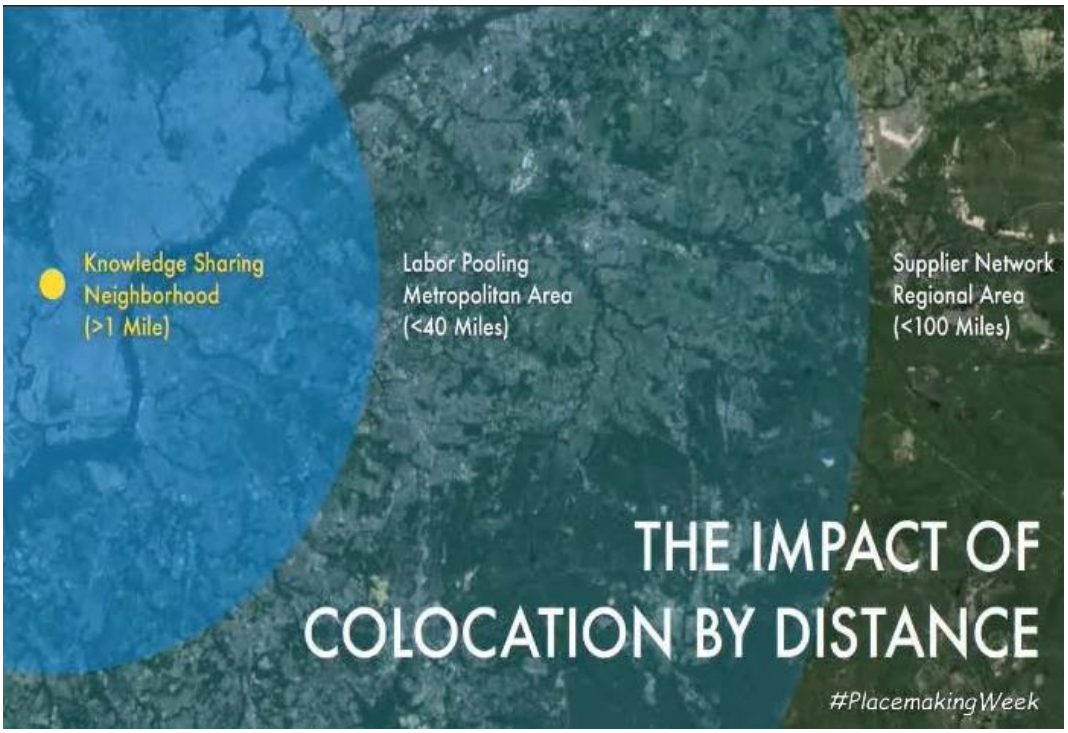


Figure 5.1: Innovation Districts - reach of knowledge sharing, labour and supplier impacts (Source: Bruce Katz presentation to PPS Global Conference, Vancouver, 2016)

Instead of a focus on innovation as a commercial product and these fixed, bordered areas designated as places in which innovation is manifest and "commercialized" (and which in turn implicitly create places in which innovation is not), approaching innovation as a *process* supported by a rich system of networks (as observed in the case studies and survey results) and "ongoing systems of social relations" (Granovetter, 1985) asserts the potential for an innovation which can transcend these borders, elevating the potential for innovation activity in the "in between spaces" (Gehl, 1971) and, in regard to the place/innovation nexus, mandating in turn a richer and more dynamic understanding of 'place'.

5.5 A Cultural Shift

The research proposes that both this richer and more nuanced understanding of place and the "dynamic processes of innovation" (Rissola, 2017) are underpinned by a marked shift toward a distinctly 'cultural' construct. This shift is observable in those "in between spaces" (Gehl, 1971) of the 'Reimaged Urban Areas' identified by Katz and Wagner (2014) as an emerging typology of innovation district, exemplified by the (meteoric) rise of the Pioneer Square district in Seattle (see Section 4.2.3.1.2), but also (noted by Katz and Wagner, 2014) present in Boston's Seaport development (see Section 4.2.1.2.2), in The Federation and NOMA, Greater Manchester (see Section 4.2.1.1.4), and in the development of the Baltic Triangle, Ten Streets and Fabric District areas in Liverpool (see Section 4.2.4). All of these areas are, as Katz and Wagner (2014) posit, "found near or along historic waterfronts, is where industrial or warehouse districts are undergoing a physical and economic transformation" and there is a marked social enterprise and third sector presence (33% of companies surveyed at The Federation, NOMA and 30% of companies surveyed at Impact Hub Seattle, based on Pioneer Square, self-identify in the survey as 'not for profit'; see Section 4.2.6). These factors are noted in the emerging place taxonomy as correlative to a 'place-grounded' approach (Table 5.2).

INNOVATION SPACE	SECTOR	CONSTRUCT	CONCEPT	PLACE
Science Parks	Private	Spatial	Where	Place-blind
Anchor Plus	Public/Academic	Institutional	What	Place-based
Reimagined Urban Areas	Social/3rd	Mission-led	Who	Place-grounded
Grassroots	Holistic/4th	Community	How	Place-driven

Table 5.2: A new place taxonomy: The cultural shift

This shift toward a more fluid and culturally-aware understanding of 'innovation' can arguably be observed too in the results of the word frequency content analysis, in which we see a discernible shift in the 'top 5' words occurring from fifteen selected key words toward incorporation of 'place', 'culture' and 'community' in the later stages of research, along with a first entry for 'heritage' in results from the Liverpool City-region case-study (Table 5.3).

BOSTON	SEATTLE	GM	EXPERTS 1	M4 2017	M4 2018	LCR	EXPERTS 2
INNOVATION	INNOVATION	INNOVATION	INNOVATION	INNOVATION	INNOVATION	INNOVATION	INNOVATION
NETWORK	NETWORK	NETWORK	COMMUNITY	SOCIAL	PLACE	CULTURE	PLACE
SPACE	SOCIAL	PLACE	CULTURE	HOUSING	SUSTAINABLE	COMMUNITY	ECONOMY
SOCIAL	SPACE	SUSTAINABLE	PLACE	COMMUNITY	COMMUNITY	HERITAGE	COMMUNITY
ECONOMY	ECONOMY	SOCIAL	SOCIAL	PLACE	SPACE	SPACE	SOCIAL

Table 5.3: Keyword analysis showing move toward community/culture/place

Acknowledgement of the importance of 'culture' in relation to innovation is observable too in the results from the M4 Delphi exercise, where 33% of panellists across both years (2017 and 2018) identified the 'Cultural Offer' of the surrounding 'innovation district' (NOMA, Manchester; see Section 4.2.1.1.4) as a critical factor in their decision to locate in the area (See Section 4.6.2.2). Qualitative results across all stages of the research also support the integral relationship between innovation and culture, notably Participant H's assertion that "Innovation happens when culture and the economy clash together" (Participant H interview, 15th February 2017; see Section 4.2.2).

5.5.1 Culture and Innovation – Mapping the Dynamics

Early findings emerging from this research informed 'The IT Living Platform', a 2017 data visualisation project led by the University of Salford's School of the Built Environment (SoBE) and ThinkLab teams, working in partnership with Salford City Council and Media City UK. The project developed and piloted a secure and web-based 'real-time' data visualisation platform designed to support multi-agency collaboration in addressing complex and/or cross-boundary challenges. As part of the pilot study, 'real-time' data from four major social media platforms (harvested from users in Greater Manchester over the course of the first weekend in July) was collected, mapped and visualised via the platform. One of the studies delivered through the pilot focussed on selected hashtags related to culture (including cultural assets, cultural activity and cultural experiences). The resulting data visualisation map is shown as Figure 5.2.

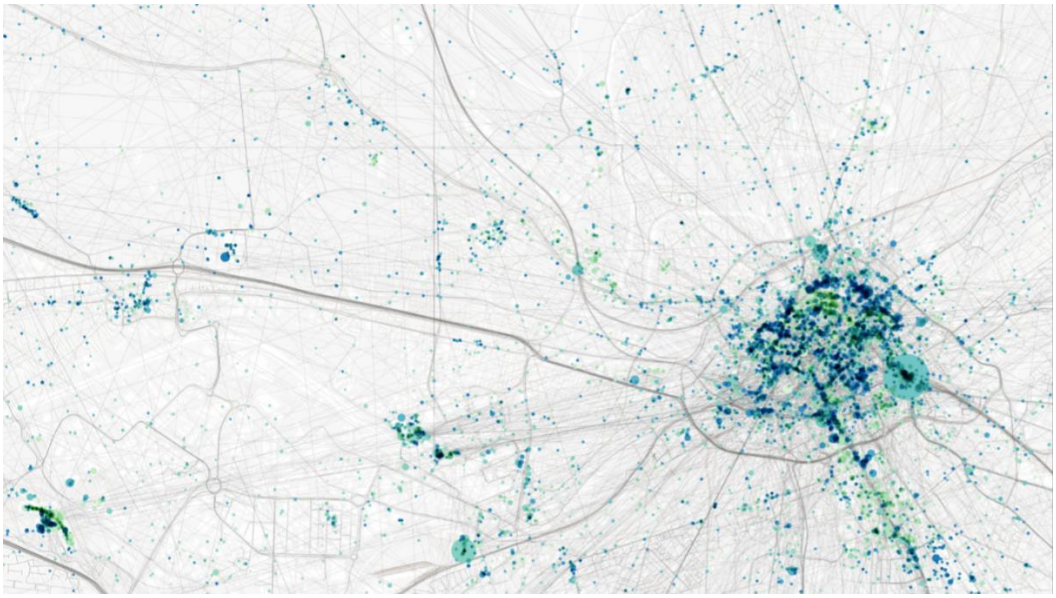


Figure 5.2: GM Social media usage using culture-related hashtags
(Source: The 'IT Living Platform' project, 2017)

The map reveals an interesting correlation in the culture-related social media hashtag analysis and the spatial distribution of established and emerging 'innovation districts' across Greater Manchester (see Section 4.2.1.1). As shown in Figure 5.3, better established districts such as the Oxford Road Corridor and Media City UK are revealed as particular 'hot-spots' for culture-related hashtag activity, with the area around NOMA and The Federation, and the Oldham Road, which extends past The Sharp Project to Oldham and the Wayra incubator, both showing lesser, but still strong signs of activity, and a third 'corridor' of activity emerging, albeit distributed and with less concentration, between the North-East area of the City-Centre and the main University of Salford campus. While key cultural institutions are notably prominent on the map, there are clear patterns of dynamism, connection and activity too in the spaces 'in between' (Gehl, 2017).

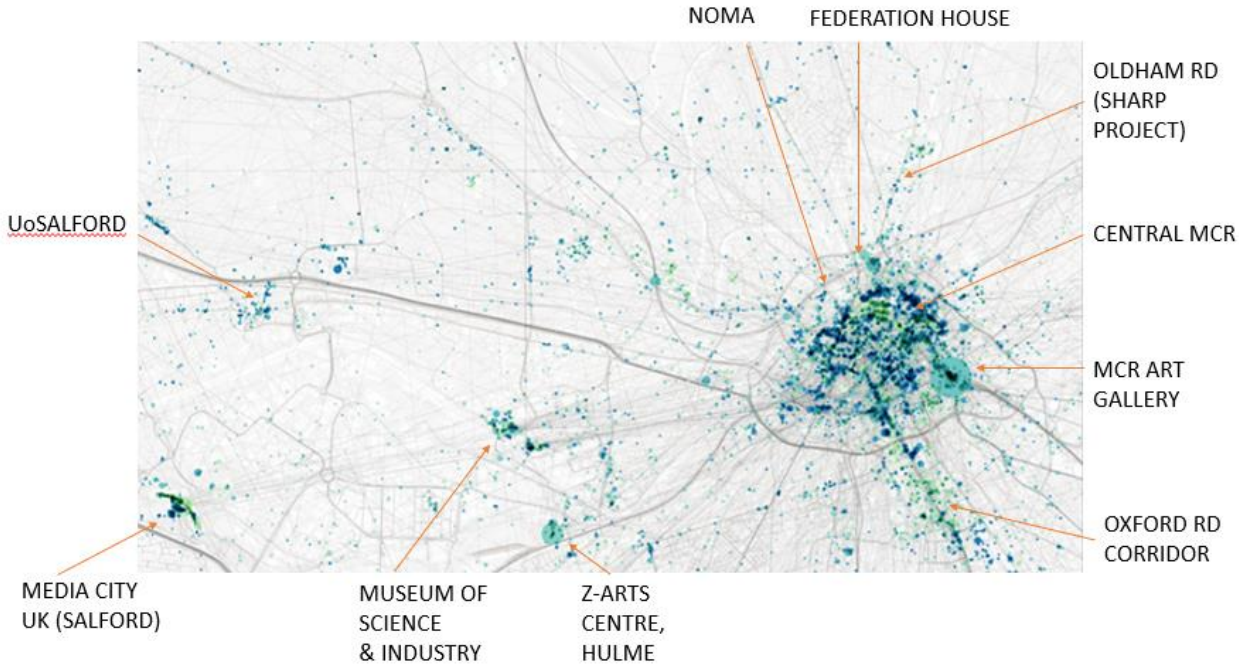


Figure 5.3: GM innovation districts mapped across culture-related hashtags
(Source: The 'IT Living Platform' project, 2017 – Author's own elaboration)

5.5.2 Culture – Real and Imagined

Greater Manchester's MediaCityUK, Salford is an interesting example of the cumulative integration of culture into an innovation district. MediaCityUK was initially developed in the late 1990s as 'The Quays', a private-sector development offering high-grade office-space led by the Peel Group. Partnering with Salford City Council in 2000, the offer was extended to include The Lowry Shopping Centre and The Lowry Theatre and, in 2003, to include Imperial War Museum North. Rebranding as MediaCityUK in 2007, principally in response to the Government's call to relocate the BBC (from 2004 onward), Peel introduced the University of Salford as an academic partner, opening its Media City campus in 2011, incorporating ITV studios from 2013 onward, along with further associated mixed-use retail and residential development. In early 2021, the BBC announced its intent to extend its MediaCityUK operations. The scheme's development timeline supports progress through the concepts shown (on a vertical axis) in the emerging place taxonomy (see Table 5.1), going through two development cycles of private-public/academic-cultural (the first, second and third tiers of the place taxonomy). By incorporating 'The Lowry' developments, IWM North, the University of

Salford campus and the BBC on site, the district has arguably been able to both integrate and *re-appropriate* the strong cultural heritage of those brands.

Similar re-appropriation of cultural heritage is evident in a number of other innovation districts featured in the first phase of case study including the Salt Lake Union (Seattle) Amazon campus and its Museum of Innovation (see Section 4.2.3.1.1), the relocation of the Institute of Contemporary Art to Boston's Seaport District in 2006 (see Section 4.2.2.1.2) and The Sharp Project and its strong branding links to SHARP, an industrial brand synonymous with Manchester (as former kit sponsor of Manchester United Football Club) and the former occupier of its site (see Section 4.2.1.1.3). The Sharp Project's logo is based on the footprint of the site, explicitly referencing and foregrounding its links to the brand and the building's heritage (Figure 5.4).

Figure 5.4: The SHARP Project brand heritage
(Sources: The SHARP Project and manutd.com)

At 'The Federation', based in Greater Manchester's NOMA district (see Section 4.2.1.1.4), local street artists Nomad Clan were commissioned to create art on the walls of the central collaborative workspace. The art depicts 'worker bees' (symbolic of Manchester) and incorporates various cultural references including Manchester United and City football strips, Coronation Street characters and famous Mancunian musicians. The artwork also includes quotes from Tony Walsh's poem (writing under the penname of Longfella) '*This is the Place'*,

which came to particular prominence as an anthem for the city following the terrorist attack at Manchester Arena in May 2017 (Figure 5.5).

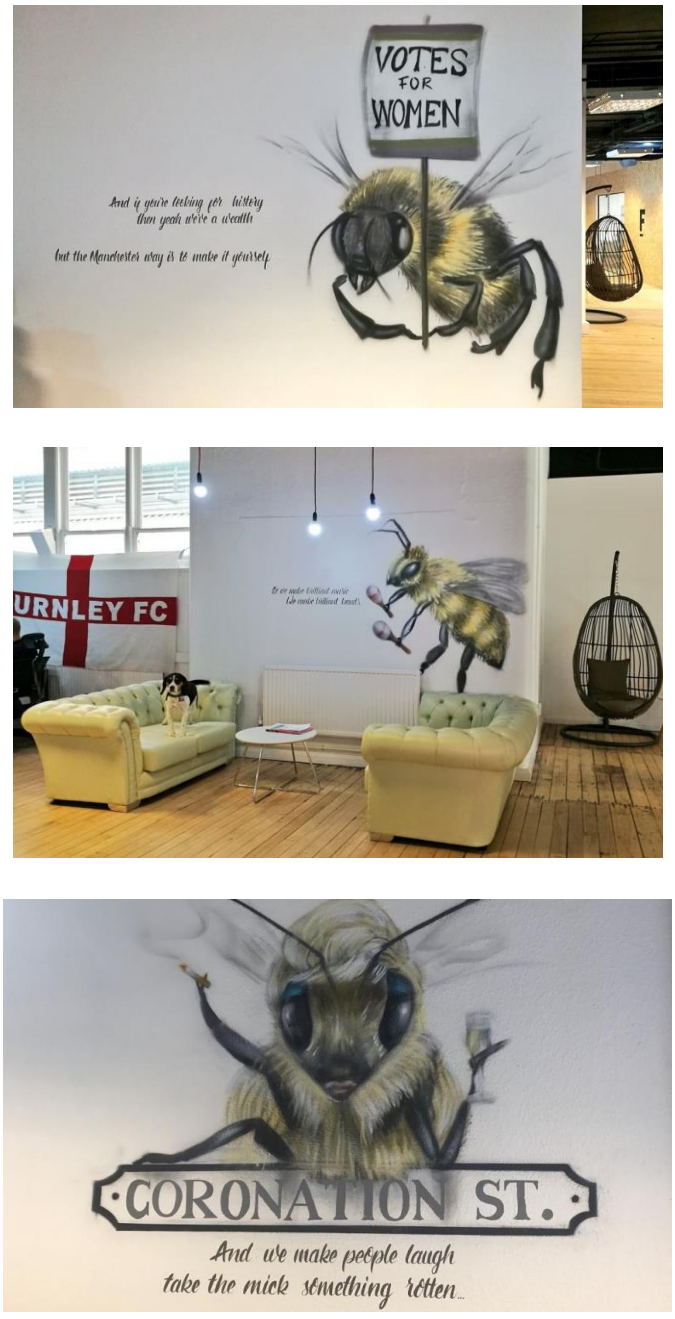


Figure 5.5: Worker Bee artwork at 'The Federation', Manchester - Nomad Clan (Source: The Federation)

These attempts to assert cultural heritage can appear heavily orchestrated (as in the Circle Square development, a "cultural pavilion' at the centre of the Oxford Road experience" (Bruntwood, 2015), and can result in instances of 'artwashing' (Pritchard, 2017) and a "uniquely bleached subculture", as observed by Participant Q (interview, 1st September 2016) in relation to Seattle's South Lake Union Amazon campus. These simulated representations of culture call to mind Baudrillard's *hyperreal* levels of simulacra, and in particular the simulacra associated with the period of late-stage capitalism "in which the distinction between reality and representation disappears and originality has no meaning" (Baudrillard, 1981). In these hyperreal experiences, 'culture' can be manifest as "someone handing me Haagen Dazs through the bushes" (Participant Q interview, 1st September 2016).

These manicured expressions of culture also call to mind Adorno's distinction between 'industry' culture and 'authentic' culture (Adorno & Horkheimer, 1947). An authentic expression of culture is arguably better observed, and closer to William's holistic expression of culture as "a whole way of life" (Williams, 1958), in expert testimony (such as Brazil's hacker movement, "with Brazilian culture at its heart" – Participant W, Barking and Dagenham's "shared heritage steeped in industry, creativity and energy" – Participant Y, and Conecta Cultura's work with Oaxaca, Chiapas and Veracruz female elders in Mexico City; see Section 4.4.9) and in expressions of 'grassroots' community culture in Liverpool City-region case study, including Kensington's 'Croissant of Inequality' community café and Anfield's 'Homebaked' bakery and pie shop, in Wavertree's "strength of our community spirit" – Participant J1 and in Granby/Toxteth where "Our community has art at its heart" – Participant K1; see Section 4.2.4.2.2).

5.6 Heritage and Humans

This shift toward cultural authenticity sits alongside a discernible shift toward community. 'Community' features as a 'top 5' key words in the word frequency analyses for the M4 Delphi exercise, the Liverpool City-region case study and second set of expert testing (see Table 5.3). 'Heritage' appears in the word frequency content analysis as a 'top 5' key word for the first time in the results from the Liverpool city-region case study (see Figure 5.3). This dual move toward 'community' and 'heritage' suggests a growing prominence and significance for *intangible* cultural heritage, defined by UNESCO as "traditions or living expressions inherited from our ancestors and passed on to our descendants" which, UNESCO notes, "can only be

heritage when it is recognized as such by the communities, groups or individuals that create, maintain and transmit it – without their recognition, nobody else can decide for them that a given expression or practice is their heritage" (UNESCO, 2003).

This sense of community leadership and agency is evident too in emerging economic development models such as 'Community Wealth Building' (Guinan et al, 2020), 'Doughnut Economics' (Raworth, 2017) and mission-oriented approaches (Mazzucato 2017; 2021) (See Section 2.9), all of which assert a 'ground-up' directionality and enhanced role for individuals and communities. The New Citizenship Project (NCP) highlights this shift toward community activism in what they call the 'Citizen Shift' (NCP, 2015), a three-stage evolutionary model which asserts a shift in individual and collective conscious from *subjects* to *consumers* to *citizens*. Real-life examples of this shift include The Black Lives Matter (BLM) movement, the #metoo movement and school strikes in protest of climate change (inspired by Greta Thunberg), as well as the expressions of collectivism and care that have emerged during the COVID-19 pandemic.

When applied to the new place taxonomy proposed by this research, an additional expression is proposed as a 'fourth layer' to NCP (2015)'s subject - consumer - citizen model, asserting a distinctly *human* approach (Table 5.4). This approach lies at the heart of a new paradigm proposed by the research in support of innovation, its concept, construct, manifest and inter-relation with 'place', denoted by a community-led, place-driven, holistic expression of ***how*** innovation is manifest, 'embedded' in community and characterised as "A Fourth Way".

INNOVATION SPACE	SECTOR	CONSTRUCT	CONCEPT	PLACE	CITIZEN SHIFT
Science Parks	Private	Spatial	Where	Place-blind	Subject
Anchor Plus	Public/Academic	Institutional	What	Place-based	Consumer
Reimagined Urban Areas	Social/3rd	Cultural	Who	Place-grounded	Citizen
Grassroots	Holistic/4th	Mission-led	How	Place-driven	Human

Table 5.4: A new place taxonomy: 'A Fourth Way' and the 'human shift'

From an innovation economy perspective, there is clear resonance with the evolution toward and emergence of 'A Fourth Way' and propositions around 'The Fourth Industrial Revolution' (World Bank, 2017) and 'Economy 4.0', which Otto Scharmer characterises as the " eco-system economy" and posits as a successor to its predecessors of state-centric (1.0), free market (2.0) and socioeconomics (3.0) (Scharmer, 2016). There is correlation too to Schott and Steinmuller's 2018 propositions around policy frames for innovation, which propose a post-war framing in science and R&D as 'Innovation 1.0', a focus on national innovation systems as 'Innovation 2.0' and an emerging focus on 'transformative change' and socio-technical ecosystems as 'Innovation 3.0' (Schott & Steinmuller, 2018). 'A Fourth Way' proposes a fourth layer to this proposition as 'Innovation 4.0', characterised as post-transformative *evolution* (Table 5.5).

INNOV SPACE	**SECTOR**	**CONSTRUCT**	**CONCEPT**	**PLACE**	**ECONOMY**	**INNOV POLICY**
Science Parks	Private	Spatial	Where	Place-blind	State-centric	Science/ R&D
Anchor Plus	Public/ Academic	Institutional	What	Place-based	Free-Market	National Systems
Reimagined Urban Areas	Social/ 3rd	Cultural	Who	Place-grounded	Socio-Economic	Transformative Change
Grassroots	Holistic/4th	Mission-led	How	Place-driven	Ecosystem	Evolution

Table 5.5: 'A Fourth Way' and Innovation Economy 4.0

5.7 Experience and Embodiment

Reflecting the 'human shift' and the foregrounding of the human *experience* of place, the Sustainable Innovation Wheel (see Section 4.3) and, later, the Civic Investment Value index (see Section 4.8) incorporate experiential indicators of place as key measurables. In both cases, it is proposed that qualitative feedback and quantitative scores are collected from citizens with

lived experience of the place in question, specifically relating to individual experience of social, spatial and cultural aspects.

This simple scoring method was trialled in the research as part of the 'M4' Action Research project (see Section 4.6.1), gathering feedback from thirty citizen participants engaged in the 'M4' project through 'The Streets' programme of activities. 'The Streets' programme incorporated three discrete, but interconnected, projects, broadly correlating to the spatial, social and cultural axes of the 'SI Wheel' and each focussed on a sensory experience of 'place' – 'The Sounds of the Streets', working with citizens experiencing homelessness in collecting sonic and audio materials, working with DivaManc to collect responses from female citizens to visual imagery in specific spatial contexts, and with ProjektsMcr skateboarding community to map topographical information relating to tactile sensory perception (see Section 4.6).

There is significant resonance between these 'human' and sensory experiences of 'place' and the concept of 'embodiment', used by humanistic geographers (notably Thrift, 2003) to describe a 'bodily geography', both in terms of the physical interrelationship between the human body and place (Holloway & Hubbard, 2001) and to denote the multi-sensory experience of space and place through "visual, aural and tactile elements, as well as tastes and smells" (Hubbard & Kitchin, 2010).

These principles of 'embodiment' can also be observed in the close relations between spatial and structural dynamics and light and sound (see Section 2.7), and in LeFebvre's seminal *Rhythmanalysis* in which he asserts that "Everywhere where there is interaction between a space, a time and an expenditure of energy, there is *rhythm*" (LeFebvre & Regulier, 1994). Arguably there is a resonance here both with Granovetter's "embedded in concrete, ongoing systems of social relations" and, in turn, a more harmonious alignment with the "dynamic processes of innovation" (Rissola, 2017). Inspired by these sensory dynamics as expressed through 'embodiment', along with a number of visits to cultural institutions in the case study city-regions (notably, to the 'Light and Space' exhibition at Seattle Art Museum in August 2016), early iterations of the research posited a directional flow for these dynamic innovation processes which might follow (or mimic) the behaviours of light, emerging outward from a centrifugal central point (see Figure 5.6). This principle has inspired both the proposed 'place-driven' dynamics of 'A Fourth Way', as set out in the new place taxonomy (See Table 5.1), and the proposed dynamics of the 'Sustainable Innovation Wheel' (see Section 4.3).

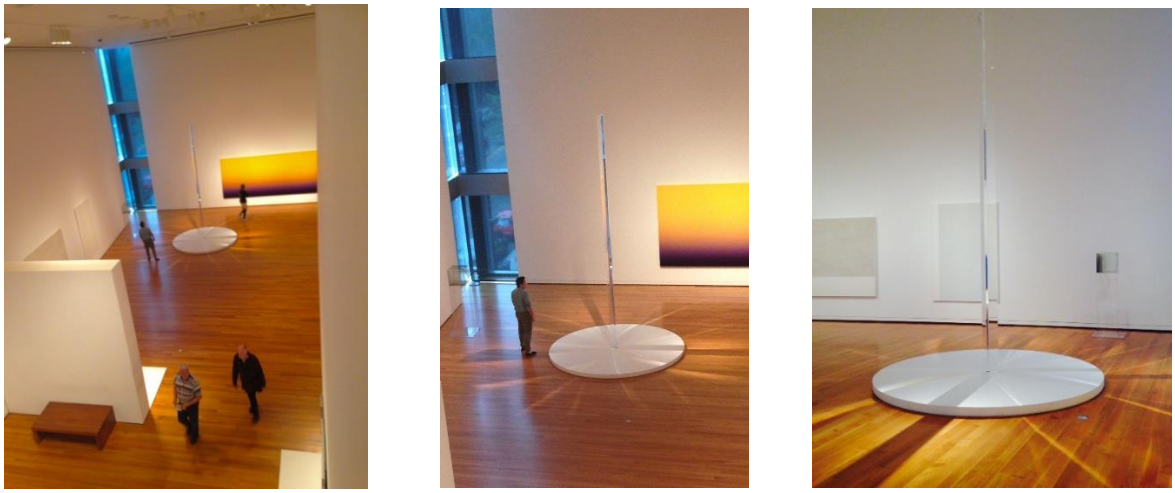


Figure 5.6 - Images from the 'Light and Space' Exhibition, Seattle Art Museum, August 2016

(Source: Author's own)

Similarly, the dynamics proposed for the Civic Investment Value (CIV4.0) index (Section 4.8) are inspired by the behaviours of sound. The conical shape used to illustrate the index is inspired by sound cones (and also by a rich provenance of utilising pyramids and conical shapes to illustrate intangible items and processes, as in light cones, Maslow (1943)'s pyramid of need and 'The Cone of Plausibility' commonly used by Futurologists). The concept of 'place-driven' dynamics generated through a holistic motion at the base is inspired, for example, by the sonic dynamics of 'sound bowls'. These idiophonic instruments generate sound through applied friction in a circular motion and subsequent harmonisation of multiple vibrations (Inacio et al, 2003). Further, there is an assertion that the matter of place, that is, the substance which exists inside of the cone, is of consequence. The unique sound of a particular place cannot, as it were, travel in a vacuum.

5.8 Open Innovation & Spatiotemporal Flows

Observance of this idiophonic sound dynamic has in turn influenced the conception and proposal of an 'upward spiral' spatiotemporal flow (Figure 5.7), posited as an ideal and in direct oppose to Harvey's "downward spiral" of globalisation which, he says, represents "the capital flow of anti-value based on the accumulation of debt as a claim on future labour" and "the annihilation of space over time" (Harvey, 2017).

Figure 5.7: The ‘Upward Spiral’ spatiotemporal flow

This phenomenon of spatial annihilation can arguably be observed in a noted scarcity of public and green space, a trend in the last 2010s toward more ‘compact living’ (described by Participant I in relation to accommodation for MIT students as “designed for optimal individual living within a communal environment”), and an associated issue around the availability and affordability of housing in and around ‘innovation districts’. Unaffordability of housing was highlighted by 29% of respondents at Impact Hub Seattle and 30% of respondents at The Federation, Greater Manchester as a key challenge. A lack of green/public space was also highlighted by 26% of respondents at The Federation and by 21% of respondents at Impact Hub Seattle.

Instead, ‘A Fourth Way’ proposes the ‘upward spiral’ (Figure 5.7) in which the base of the cone – representing the grassroots, the public, the people of the place – is attributed the most space (both in the figure, and in corresponding terms around community land ownership). This mirrors an emerging trend in the 2020s, and one which has been further exacerbated during the COVID-19 pandemic, toward open innovation, correlated to the creation and/or repurposing of space as new or enhanced public parks and open spaces. While ‘open innovation’ is usually applied as a term to a collaborative form of innovation operating beyond usual sectors, silos and competitive ‘trade secrets’, and while evidence of that approach is evident in the first set of expert interviews, such as the Leeds GovJam model (see Section 4.4.2) and Hacker Lab Rio (see Section 4.4.6), there is evidence too of a literal ‘opening up’ of spaces for innovation. In

Boston, the city's annual 'Hub Week' festival sees the Rose Kennedy Greenway, a 15-acre central greenspace created by landfill over a former central highway which runs through the core of its downtown, transformed as an 'outdoor innovation hub', bringing citizens together with academic and corporate partners, community innovation and enterprise platforms in showcasing a range of new prototypes and test-projects and to meet, interact and collaborate in an open and accessible public space.

Also in the US, and as noted through feedback from the first set of expert interviews, the city of Detroit has been at the forefront of pioneering work with the US-wide *Reimagining the Civic Commons* initiative (see Section 4.4.4), developing parks, open spaces and the public realm surrounding 'anchor institutions' such as universities as ad-hoc innovation spaces, tackling disengagement and the notion of 'hard to reach' communities by creating a physical fabric which 'opens up' anchor institutions to connect with citizens. Similar approaches can be observed in Barcelona with its 'Superblocks' (see Section 4.4.3), Helsinki's 'smart, slow spaces' in the Kalasamata district (see Section 4.4.5) and St. Helens' 'Town as Art Gallery' (see Section 4.4.10). Recent UK examples of this move toward a reclamation and restatement of *public* space include Manchester's 2020 announcement of a new 6.5-acre public park in the Mayfield district of the city-centre (to the immediate north of the Oxford Road corridor, toward the city's main train terminal, Piccadilly Station), Stockton on Tees' confirmed redevelopment of the former Castlegate shopping centre and central high street as a public park (with works due to start in 2021) and a call for proposals from Nottingham City Council to support redevelopment of the former Broadmarsh Shopping Centre site, which sits at the heart of the city, as a public park following the centre's owner Intu going into administration in June 2020.

5.9 Place & Displacement

This 'opening up' in terms of both open innovation and opening new public spaces reasserts the pivotal tension between fixed, static concepts of place and the "dynamic processes of innovation" (Rissola, 2017). The elevation of 'in between' spaces, parks and public realm demonstrates resonance with a post-structural ideology, exploring the notion of 'othering' in binary constructs (notably in the work of Foucault, Hegel Freud, Sartre and Lacan) and the spaces in between those binary propositions and structures, noting the delineated boundaries which separate those structures and the impact of a 'centre' necessitating peripheries and margins (Derrida, 1972). Arguably, these phenomena can all be observed in the way in which

urban economies are organised, in gentrification and the 'unintended consequences' of placemaking, and also the way in which spatial constructs such as 'innovation districts' (and 'knowledge quarters', 'creative quarters', 'learning districts' and so on) are manifest.

Katz assertion of a one-mile radius of 'knowledge sharing' impacts (see Figure 5.1) begs the question of what happens beyond the 'delineated boundary' (Derrida, 1972). Taking the case study areas included within this research as examples, Greater Manchester's Oxford Road corridor is neighboured by the Hulme district, where 49% of its population live in poverty, Moss Side, where 41.8% of its population live in poverty and Rusholme, where 36.9% of its population live in poverty (Manchester City Council, 2019). 20% of Rusholme's population have South-East Asian heritage (Manchester City Council, 2019) and 56.7% of the population of Moss Side identify as Black (Manchester City Council, 2019). The 'Knowledge Quarter' in Liverpool (see Section 4.10.1.2) is bordered by the Kensington district (see Section 4.10.3.1), one of the most deprived districts in the country (where 98.2% o its residents are amongst the top 5% most economically deprived in England). Sheil Road, Kensington, an area of concentrated poverty and anti-social behaviour which is recognised as the city's 'red light district' is only one mile away from Liverpool Innovation Park (Figure 5.8). In Seattle, Pioneer Square Labs, a start-up studio space which has secured $27.5 million investment in its validation and accelerator platform and raised over $80 million for its start-up venture capital fund, is located on 2nd Avenue South, immediately behind the Union Gospel Mission Shelter for men experiencing homelessness, which sits just beyond the 'delineated boundary' on 3rd Avenue South (Figure 5.9).

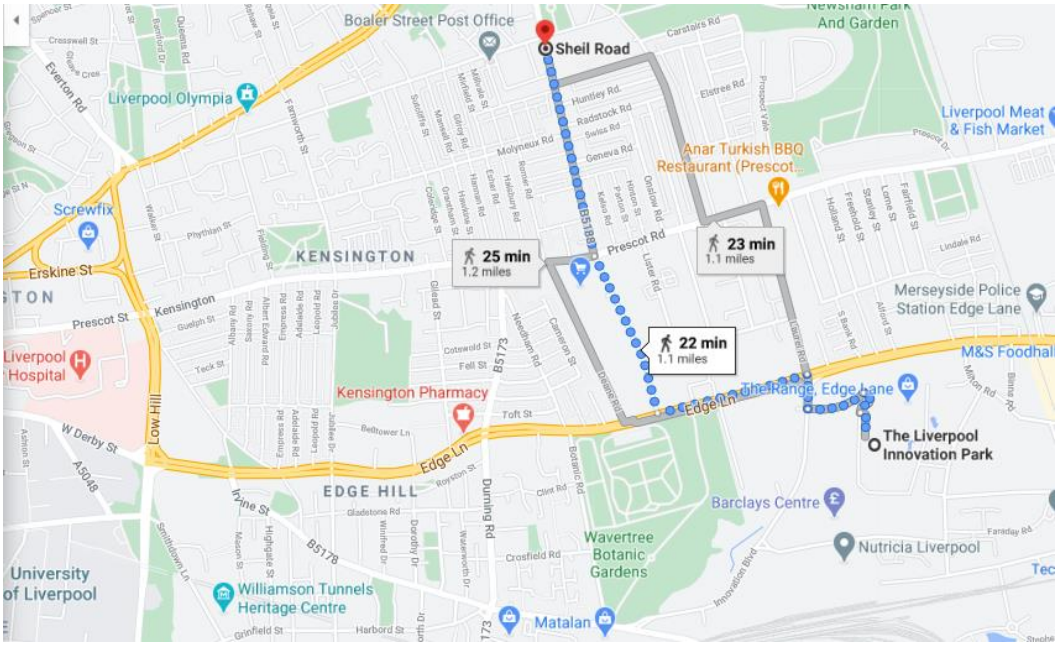


Figure 5.8: Map showing proximity of Sheil Road, Kensington, Liverpool and the Liverpool Innovation Park (Source: Googlemaps)

Figure 5.9: Map showing proximity of Pioneer Square Labs and the Union Gospel Mission, Pioneer Square, Seattle (Source: Google Maps)

Homelessness is a prominent feature in all of the case study economies, and particularly so in Seattle/King County and Greater Manchester where the respective Mayors have declared 'a state of emergency' (Mayor Ed Murray, 2016) and a 'humanitarian crisis' (Mayor Andy Burnham, 2018). In each case study area, the metropolitan cities at the core have pursued 'regeneration' and economic growth models based on hyper-investment in property development, with a particular focus on the central/downtown areas. In each case, unaffordability of housing is highlighted as an issue (in semi-structured interview and through survey in Seattle and Greater Manchester, where 29% and 30% of respondents, respectively, identified unaffordability as an issue). It might be argued that the creation of 'place' in this way, with little investment in social and affordable housing (in 2018, it was revealed that less than 8% of legally required 'Section 106' contributions from private sector developers for social housing had been collected in Greater Manchester; see The Meteor, 2018) and with scant regard for affordability and exponentially rising house prices (resulting, for example, in the median cost of a single-family home in Cambridge, MA standing at $1.5m in 2017) has contributed in turn to the marginalization of people and communities that sit outside of the

‘delineated boundaries’ of place. A dogged pursuit of ‘place’ has arguably led to significant displacement.

There is a similar, and to some extent corelated, issue of displacement and marginalization of people of colour, apparent in each of the case study city-regions. African American citizens make up just 6% of Seattle’s population, but account for 29% of its citizens experiencing homelessness (City of Seattle, 2019). In Boston, where 23% of the city’s population is Black or African American (City of Boston, 2020) and 10% identify as Asian, poverty levels are disproportionately high for people of colour, with 24% of the Black and African American population living in poverty, 31% of the Asian population and 12% of the white population (DataUSA, 2020). Poverty and low wages in Boston are concentrated in areas with high Black and Asian populations, notably Roxbury, Dorchester and Mattapan (see Figure 5.10).

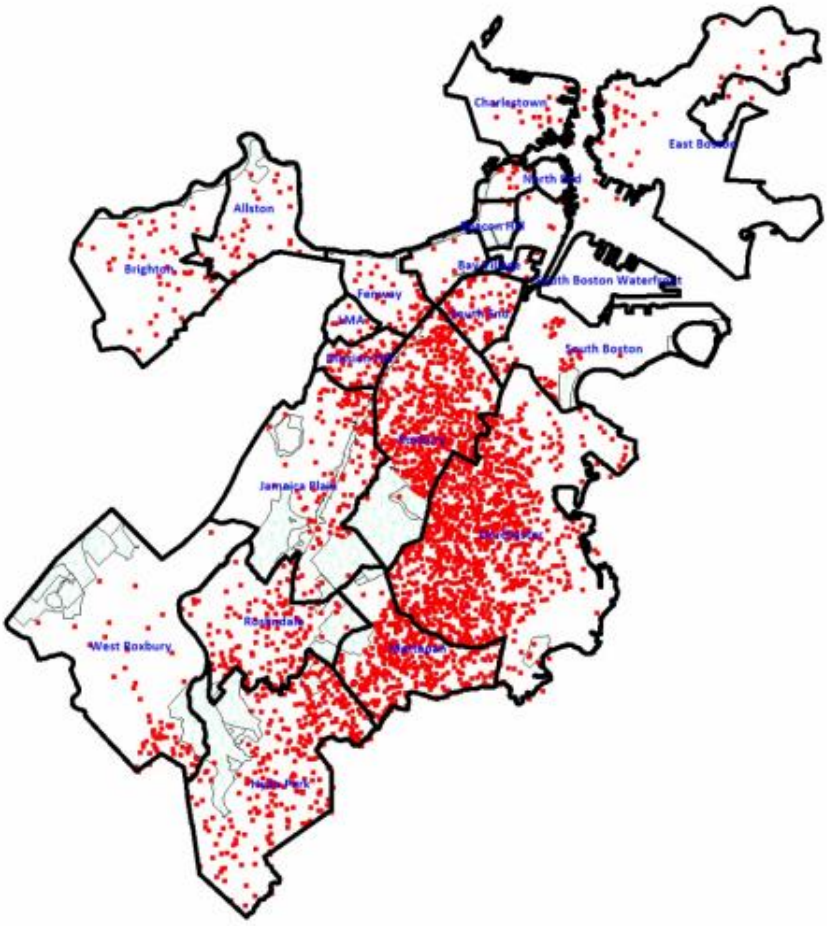


Figure 5.10: Map showing concentrated ‘hot spots’ of poverty in Boston
(Source: Jennings, 2019)

In the city of Manchester, where over 83% of the population is white, there is an established Asian and British Asian community, representing 10.6% of the population (ONS, 2019), with a high concentration of Asian and British Asian residents living in the district of Rusholme, immediately to the south of the 'Oxford Road Corridor'. In the city of Liverpool, where 87% of the population is white, 72% of its Black population lives in the Granby/Toxteth district (UK Census 2011; see Section 4.2.4.2.2).

A 2017 report series by The Boston Globe's 'Spotlight Team' highlighted the entrenched on ongoing problems in terms of securing racial diversity in business and civic leadership, noting that only 4.6% of employees at 'official or managerial level' in the city identify as black and further that this represents just a 1% rise on the same statistic from the newspaper's survey forty years earlier, in 1977 (Boston Globe, 2017). The series, which also notes the disparity between 'median household worth' in the city which, in 2017, stood at $247,500 net for white households and just $8 for black households, saves particular critique for the Seaport District (see Section 4.2.2.1.2), saying "The City had a rare opportunity to build a new neighborhood for all Bostonians. Instead, it built the Seaport.". In his piece "A brand new Boston, even Whiter than the Old", Globe correspondent Andrew Ryan reports that "Lenders have issued only 3 residential mortgages to black buyers in the Seaport's main census tracts, out of 660 in the past decade. The population is 3 percent black and 89 percent white with a median household income of nearly $133,000, the highest of any Boston ZIP code" (Boston Globe, 2017).

In this research, the word 'diversity' appears as an emerging area of challenge, sitting just outside of the 'top 5' most frequently used words across the case studies and expert interviews. While there are clear indications of efforts in all cities to address racial marginalisation in the innovation space, including the stated intent from newly appointed Venture Café New England president Daniel Vidana to 'significantly enhance the diversity of the Boston innovation community', there remains a sense of exclusion and 'innovation at arms-length' in terms of, for example, investment in Roxbury and the Roxbury Innovation Centre, which arguably sustains a real and perceived polarisation and which, despite hosting a 'Fab Lab' and 3-D printing facilities, is nowhere near the scale of investment and infrastructural capacity present, for example, in the Cambridge Innovation Centre. Given the scale and entrenchment of the problem, initiatives such as the Cronin Group's sponsorship of a 'free and frequent shuttle bus service' between the Seaport District and Roxbury (negotiated with the city as part of an $81m development deal) seem limited and, arguably, could be adjudged as tokenistic. In contrast, the Liverpool City-region's approach has been to integrate its rich cultural diversity as a priority

within its economic development strategy and post-COVID recovery plans, noted explicitly in Participant O1's comment that "*Diversity can drive our city-region's recovery*" (Zoom interview, 13th January 2021). The city has already found great success and strength founded in and celebrated through its cultural diversity, with a prominent example of that success being the 'homesteading' collaboration between the community-led Granby Four Streets CLT and Assemble architecture and design practice, which was awarded the Turner Prize in 2015.

5.10 Sustainability & Care

The theme of 'sustainability' is present throughout the research. The word 'sustainable' features in the 'top 5' key words used in all of the case studies and sits just outside of the 'top 5' in the remaining word frequency analyses. Sustainability is a key feature in a number of current and emerging economic development models (see Section 2.9), and particularly in Kate Raworth's 'Doughnut Economics' (Raworth, 2017), which centres on a finding an economic 'sweet spot' between social needs and planetary limitations. It is the primary focus, applied to innovation, of the 'Sustainable Innovation Wheel' (see Section 4.3) and of the UN Sustainable Development Goals (SDGs), which are incorporated within the CIV4.0 index (see Section 4.8). Interestingly, approaches to sustainability are not confined to 'green' and low carbon initiatives but are founded on people and human agency. Examples of this 'people first' approach to sustainability (drawn from expert interviews undertaken as part of the research) include Detroit's 'Working with Lots' programme, a large-scale trade, skills and enterprise training for people living locally, including offering lot space for new businesses in formerly vacant units and training in green-space management and sustainability (prompting Participant T's comment that "*Investment in space is one thing, but it is the investment in our people, our human capital, that brings this place to life*" – Zoom interview,14th January 2021) and Participant V1's feedback that "*If you want to secure sustainability for anything, you need to involve the kids and the schools*" (Zoom interview, 15th January 2021).

'Care' first registers as a top 5 most frequently used word (from outside of the fifteen selected key words) in the second round of the M4 Delphi exercise (May 2018), along with 'development' (frequently linked in its usage to the phrase 'sustainable development'), 'change', 'self' and 'time'. Both global sustainability and care (for 'self', others and the planet) have since been foregrounded by the COVID-19 pandemic and its broad-ranging impacts, effects and challenges, as noted by Participant N1 who observes that the pandemic has

"*elevated care as being absolutely integral to our social and economic fabric*" (Participant N1 interview, 5th January 2021). Participant N1 also notes the breadth and depth of connectivity that has emerged in response to the pandemic and associated lockdowns, observing a "*groundswell of deep connection and just looking after each other"* (Participant N1, 5th January 2021).

It is interesting to note that while the global pandemic has resulted in an increased awareness of global issues and pan-global connectivity, it has also spurred this renewed interest in localism and community. The associated 'lockdowns' have fostered, and arguably necessitated, calls for convenience and locally-based businesses and services. This phenomenon can arguably be observed in the word frequency analyses for the Liverpool City-region case study, where the 'top 5' non-keyword results were 'making', 'young', 'street', 'council' and 'area' and the second set of expert interviews, from which the 'top 5' non-keyword results were 'lockdown', 'local', 'future', 'power' and 'COVID'.

This dual focus on global sustainability issues and, at the same time, self-care and connections to community is redolent of Scharmer's concept of 'ecosystem economics', characterised as 'Economy 4.0' which he describes as marked not only by a sharply focussed awareness of the global economy as a networked, reciprocal ecosystem, but by an awareness and understanding of the role of the individual as a direct contributor to and within that global ecosystem (Scharmer, 2016). In *How to be a Good Ancestor*, Roman Krznaric makes the criticality of the connection between 'care' and 'sustainability' explicit, describing the latter as "the transcendent goal of creating a world in which the needs of future generations can be met with the resources on our finite planet", and opining that "If people just don't care, we're doomed." (Krznaric, 2020).

5.11 Time, Care and Cultural Heritage

Heidegger's triad of 'care' in *Being and Time*, incorporating 'sorge', representing reflexive care for the self, 'besorgen' representing the immediate provision of care, and 'fursorge' representing concern for the future welfare of others scans well across the differing expressions of 'care' expressed in the research. Heidegger's conclusion, that "Temporality reveals itself to be the sense of authentic care" (Heidegger, 1927), in turn foregrounds the universally critical concept of time. Time is fundamental to both care, in that a level of care is often demonstrated

through the corresponding dedication of time, and to sustainability, in that efforts toward sustainability are, in effect, efforts to 'buy time' for the human species and the planet.

Introducing the concept of cultural heritage to the exploration of the place/innovation nexus asserts both an conceptual and material temporality – conceptual in the integral inter-relationship between heritage and time, as demonstrated by the RSA's definition of heritage as "anything inherited from the past that helps us, collectively or individually, to understand the present, and create a (better) future" (RSA, 2017a) and UNESCO's 2003 definition of 'intangible cultural heritage as "traditions or living expressions inherited from our ancestors and passed on to our descendants" (UNESCO, 2003), and material in consideration to UNESCO's definition of cultural heritage as 'monuments, groups of buildings and sites' in the articles of 1972 World Heritage Convention, drafted specifically to counter the "damage, decay, deterioration, destruction and disappearance" of cultural heritage assets and in which there is an expectation of member States to adopt a duty of *care* in relation their "identification, protection, conservation, presentation and transmission to future generations" (UNESCO, 1972).

These widely acknowledged and accepted definitions of heritage and intangible/tangible cultural heritage and their implicit and explicit assertion of the importance of temporality to relative *value* create fertile ground for consideration of the place/innovation nexus in several ways. Firstly, the 1972 definition foregrounds structures and buildings, identified as an ongoing phenomenon by Participant V1 who observes that "*There is this obsession with universities building buildings for this research or that theme or that area of study and having 'A.N.Other' sponsor's name attached to them. They are building these things as palaces of knowledge but end up becoming mausoleums. We <u>don't need any more</u> buildings*" (Participant V1, Zoom interview, 15th January 2021). Secondly, UNESCO's explicit recognition that intangible cultural heritage "can only be heritage when it is recognized as such by the communities, groups or individuals that create, maintain and transmit it" (UNESCO, 2003) is worthy of note. There are a number of instances in the case study examples where there is evidence of appropriation of aspects of intangible cultural heritage by innovation hubs and innovation districts, arguably as a device to demonstrate a resonance with place, appropriating in turn a heritage *value* and the expectation of *care* and stewardship that comes with that value. Examples here include (as noted in Section 5.5.2) depictions of Manchester's civic symbol of the worker bee stylised as local sporting and entertainment stars alongside quotations from local poet Longfella's anthemic poem *This is the Place* on the walls of The Federation (see

Figure 5.5), and orchestrated adoption of, for example, an area's recognised heritage and associated characteristics, as in 'The Fabric District' in the Liverpool City-region (see Section 4.2.10.2). Finally, there are examples within the research where areas identified as 'innovation hubs' or 'innovation districts' have since shown signs of decay and deterioration, and which have in some cases ceased to operate or exist. These include The Federation which closed in December 2020 to make way for a new Amazon UK Campus, Impact Hub Seattle, which closed in May 2020 citing COVID-19 impacts and competition from the (Wall Street backed) 'We Work' chain of co-working spaces, and Liverpool Innovation Park, which at the time of writing sits in a state of disrepair and which is no longer host to the International Centre for Digital Content (which closed in 2012), but which instead is home to a large NHS facility (as an 'anchor tenant'), plus the AIMES data storage centre, and a relatively small number of e-health start-ups (43) for its size, alongside a 'drive-thru' Costa Coffee, a gym and 'The Range' homewares store (Figure 5.11).

Figure 5.11: Liverpool Innovation Park and grounds, February 2021

(Source: Author's own)

In sharp contrast, both Homebaked CIC and Granby Four Streets Market (which lost all of its stalls and equipment in a storage facility fire in September 2020) in the Liverpool City-region and Midsteeple Quarter in Dumfries (featured in the first set of expert interviews) have been backed by significant 'crowdfunding' initiatives over 2020/21, supporting new equipment for Granby Market and the purchase of new community-owned housing for both Homebacked CIC and Midsteeple Quarter. These initiatives have been supported through the pandemic and beyond by communities that *care*.

5.12 Time, Space & Transcendence

Time is a critical factor in the central tension which sits behind the research, that between static and fixed understandings of 'place' – that is, not changing over time – and the inherently "dynamic processes" of innovation (Rissola, 2017) – that is, changing (and often, rapidly) over time. A similar tension arguably exists between the built and structural focus of the definition of 'cultural heritage' delivered through UNESCO in 1972 and the calls for a recognition of impermanence which preceded its 2003 'intangible cultural heritage' counterpart. Establishing these binary polarities (fixed/place/tangible on the one hand and dynamic/innovation/intangible on the other) opens up an intersecting 'Third Space', in the tradition of Bhahba (1994), Soja (1996), Foucault (1986) and a number of post-structuralist thinkers. Extending this concept further to an encompassing – as opposed to intersecting - 'fourth space' asserts an opportunity to bring these seemingly polarised concepts together in a holistic and meta-layered space, a space which transcends traditional boundaries of separation identified by Derrida (1972) - and, with it, the centre, peripheries and margins - and which can accommodate conceptually 'opposed' characteristics, as observed, for example, in Granovetter's understanding of 'embeddedness' as "concrete, ongoing systems of social relations" (Granovetter, 1985).

Applying this 'fourth space' proposition – characterised here as 'A Fourth Way' - to spatial considerations asserts not only the spaces 'in between' structures, as present in the work of Jane Jacobs (1961) and Jan Gehl (1971), but a conceptual model which incorporates and transcends both the 'in between' spaces and the structures themselves. The proposition reflects Thrift's expressed frustration with the practice of drawing boundaries and lines around mapped blocks as containing "characteristic forces or powers" which, he notes "is always an approximation and has some serious disadvantages, most notably the tendency to assume that

boundary equals cause, the tendency to freeze what is often a highly dynamic situation … (and the tendency to)… leave so much out of contention" (Thrift, 2003). There are clear implications here for the phenomenon of 'innovation districts', bounded areas conceptualised as spaces in which innovation is produced and used, and which are delineated, arguably, just as Thrift describes. 'A Fourth Way' proposes that spatial "boundaries of separation" (Derrida, 1972) are effectively transcended in order to 'open up' the "dynamic processes" of innovation (Rissola, 2017), in effect 'opening up' a more dynamic understanding of 'place', favouring instead a 'whole place', grassroots approach to innovation (drawing from Williams 1958 definition of culture as "a whole way of life") in which all individuals and communities are automatically assured of the licence to innovate. While there is still some way to go in terms of advancing 'open innovation' models toward truly open access (to all citizens including, for example, those who are experiencing homelessness or who are otherwise marginalised), there is evidence of a more distributed approach to innovation emerging throughout the research, not only in examples of community-led initiatives in the Liverpool City-region case study such as Homebaked CIC and Granby Four Streets CIC, but also in the development of 'innovation hubs' outside of recognised 'innovation districts' such as the Roxbury Innovation Centre and Pioneer Square in Seattle (see Section 4.2.3.1.2), the development of green-space and outdoor innovation programmes, such as Detroit's work with the 'Reimaging the Civic Commons' initiative at Ella Fitzgerald Park (see Section 4.4.4), the celebration of 'Hub Week' in Boston on the Rose Fitzgerald Kennedy greenway (see Section 4.2.2.1.2) and the 'Helsinki Lab' project in the squares of Helsinki's Kalasamata district (see Section 4.4.5) and the proposals for 'Innovate GM', a post-COVID recovery plan led by the Greater Manchester LEP which envisages the creation of innovation districts in every borough of Greater Manchester as a route "*to make sure that everyone benefits from our collective success"* (Participant P1, interview 15th January 2021). Mayor Marty Walsh is pursuing a similar programme of distributed "Neighbourhood Innovation Districts" across the Boston City-region.

'A Fourth Way' envisages not just a more open and broadened conceptual horizon in terms of space (and a related 'whole place' approach to innovation), but also in terms of time. Kant, who describes time as "transcendentally ideal" asserts that both space and time are 'a priori' notions which do not have structural form, but which are "necessary perceptions for human comprehension of experience" (Kant, 1781/1999). 'A Fourth Way' introduces 'transcendental time' as an open and broad-scope concept which both incorporates and transcends the established triad of historical, chronological and intertemporal time (Bausor and Schackle,

1982). Application of this more expansive conceptual understanding to both space and time in turn impacts the spatiotemporal relationship, supporting the 'upward spiral' proposition put forward in the research (see Figure 5.7) and asserting the idea that future sustainability – that is, an ongoing, infinite accumulation of 'time' – is best supported through a broad-scope, transcendent, understanding of space, and place.

5.13 Mission: Time

Both the 'Sustainable Innovation Wheel' prototype (see Section 4.3) and the CIV 4.0 index (see Section 4.8) reflect Kant's observations around "human comprehension of experience" (Kant, 1781/1999) and incorporate experiential measures of 'place', tested through the 'M4' action research project (see Section 4.6.4). A directionality is added through 'upward spiral' proposition (see Figure 5.7), inspired by David Harvey's description of the process of globalisation as a 'downward spiral', which he further describes as "the annihilation of space over time" (Harvey, 2017). In 'A Fourth Way', the 'downward spiral' directional flow is subverted, proposing instead an upward and progressive flow, through which both space and time are expanded.

A keen awareness of the importance of directionality is also present in the work of Mazzucato, who posits that "Economic growth has not only a rate but also a direction. The task is to set that direction in ways that stimulate growth, tackle climate change and combat rising inequality" (Mazzucato, 2017). Mazzucato's describes her work on mission-oriented innovation as "resdiscovering directionality" in "moving from broad challenges to specific missions" (Mazzucato, 2021). Figure 5.12 shows Mazzucato's illustration of how these principles might be applied to the 'grand challenge' of climate change (Mazzucato, 2017).

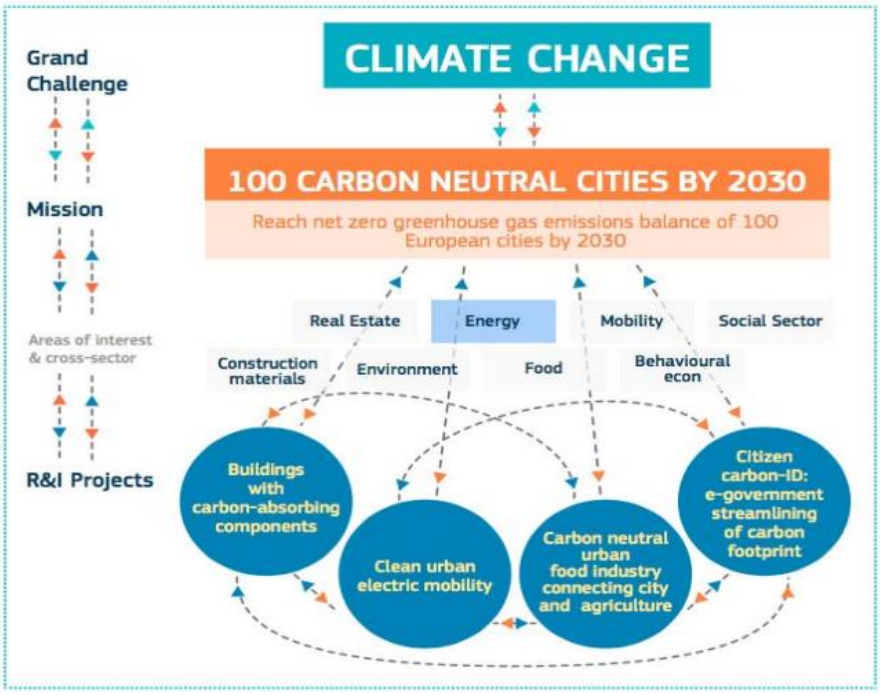


Figure 5.12: A mission-oriented approach to climate change
(Source: Mazzucato, 2017)

There is clear resonance between the upward directionality of the mission-oriented innovation framework and the 'upward spiral' of 'A Fourth Way'. Where Mazzucato's model envisages research and innovation projects along the horizontal axis, pointing toward the particular mission in question, 'A Fourth Way' envisages a 'whole place' spectrum as the horizontal platform which powers a directionality toward a shared, critical mission of gathering, generating and accumulating *time* (Figure 5.13).

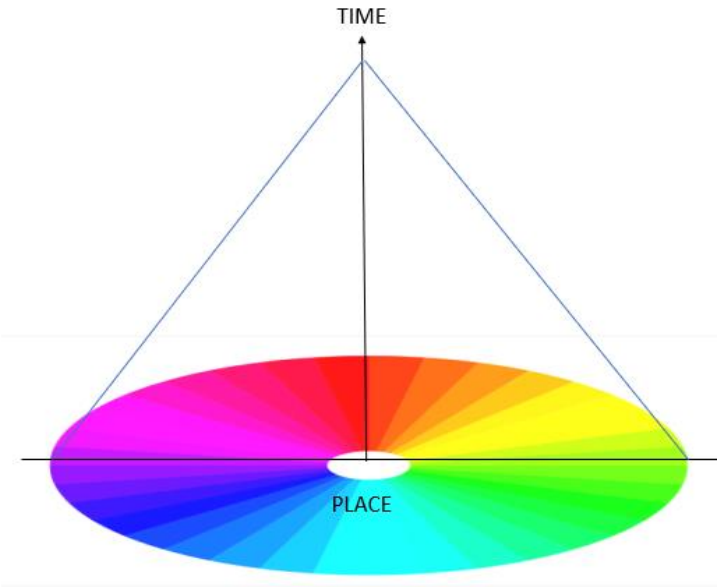


Figure 5.13: ‘A Fourth Way’ Place/Time Framework

5.14 Summary – Unlocking ‘the why’

And on the pedestal, these words appear:

My name is Ozymandias, King of Kings,

Look on my Works, ye Mighty, and despair!

Nothing beside remains. Round the decay

Of that colossal Wreck, boundless and bare

The lone and level sands stretch far away.

Ozymandias, Percy Bysshe Shelley (1818)

Restating the criticality of time returns to the central tension behind the research – that between a static, fixed understanding of ‘place’ and the inherently “dynamic processes” (Rissola, 2017) of innovation. These dynamic processes, as noted by Thrift (2003) can be subject to “the tendency to freeze what is often a highly dynamic situation” when confined to defined spatial

territories (Thrift, 2003), a conflict asserted too by Harvey's "fixed capital paradox" in which "the very form of flow designed to liberate capital ends up directing the flow back into that space*"* (Harvey, 2017). A similar tension is captured in Y. P. Tuan's distinction between space and place in which he posits that: "'place is security, space is freedom: we are attached to one and long for the other" (Tuan, 1977).

The limitations of 'innovation districts' in terms of reach beyond their defined spatial boundaries is (perhaps inadvertently) captured in Katz' description of their 'knowledge sharing' stimulus as "a square mile or less" (Katz, 2016). There is little evidence of beneficial impacts beyond the parameters as described by Katz (although he does point to labour market connections of up to forty miles and supply-chain networks of up to one-hundred miles) and evidence instead of severe deprivation in those areas immediately neighbouring designated 'innovation districts' including (but not limited to) the Kensington district of Liverpool, one of the most deprived districts in England, which neighbours the Liverpool City-region's 'Knowledge Quarter', and the Hulme, Moss Side and Rusholme districts of Manchester, which neighbour Greater Manchester's Oxford Road corridor. There is evidence too of marginalisation and displacement, particularly in terms of a notable lack of racial and ethnic diversity in 'innovation districts', as noted in the Boston Globe's analysis of the Seaport district, where 89% of residents are white (Boston Globe, 2017) and as captured by Participant P's description of Amazon's South Lake Union campus in Seattle as "a uniquely bleached subculture" (Participant Q, interview 1st September 2016). Homelessness is a prominent feature in all of the case study economies, and particularly so in Seattle (King County) and Greater Manchester, where both Mayors have declared states of emergency and where almost a third of survey respondents in both cases highlighted 'unaffordability of housing' as a key challenge.

Alongside a growing acknowledgement of diversity, unaffordability of housing and sustainability as current and emerging gaps and challenges for 'innovation districts', there is a trend too towards more open and distributed approaches to innovation, as demonstrated by Greater Manchester's 'Innovate GM' proposals which envisage the creation of innovation districts in every borough of Greater Manchester, open and greenspace innovation initiatives such as the 'Helsinki Lab' project and Detroit's work with the 'Reimagining the Civic Commons' programme and community-led initiatives such as Homebaked CIC, Granby Four Streets CIC and Love Wavertree CIC, as profiled within the Liverpool City-region case study.

These more fluid expressions of innovation move beyond delineated boundaries and, in many cases, beyond buildings. They are not necessarily anchored in or by buildings, structures and institutions as is the case with a number of 'innovation districts' (and as is the basis for Katz and Wagner's 'anchor plus' typology (Katz & Wagner, 2014), but are embedded in the relationships and dynamics of 'in between' spaces, communities and cultural heritage. These dynamic expressions of innovation - presented here in the new place taxonomy as 'grassroots', 'place-driven' innovation - resonate well in this way with Granovetter's concept of embeddedness in "concrete, ongoing social relations" (Granovetter, 1985). Without this embeddedness in place, innovation hubs and innovation districts are at varying levels of risk, instability, short-termism, election cycles and market forces, as demonstrated by the decline and part-dereliction of the Liverpool Innovation Park, by the closure of Impact Hub Seattle and by the takeover of The Federation as part of Manchester's forthcoming Amazon campus.

Arguably, via the 'place/innovation nexus', the dominant understandings of place as a fixed spatial/private ('the where') and socio-economic/commercial territory ('the what') have been extended to innovation, and specifically innovation districts, with only superficial attention paid to social relations/cultural factors ('the who') and even less to the dynamics of those factors ('the how'). Introduction of a cultural construct at the 'third level' of the place taxonomy is pivotal in the shift from 'place blind' and 'place based' to unlocking 'place grounded' and 'place driven', each with increasing levels of depth in terms of 'embeddedness'. Opening up approaches to innovation and embracing the full diversity, richness and cultural 'whole way of life' (Williams, 1958) of a place, its social relations and cultural heritage, offers a route to transcend the limitations and perceived (and real) boundaries of innovation, allowing a fuller exploration and expression of the 'place driven' model as 'the how' and creating a stable and secure, 'concrete' foundation for progress toward our shared mission of survival, sustainability and infinite generation of time – '**the why'** (Table 5.6).

SEQUENCE	INNOVATION SPACE	PLACE	SECTOR	SHIFT	CONSTRUCT	DYNAMIC	ECONOMY	INNOVATION POLICY	TIME
1.0	Science Parks	Place-blind	Private	Subject	Spatial	Fixed	State-centric	Science/ R&D (Linear)	Historical
2.0	Anchor Plus	Place-based	Public/ Academic	Consumer	Institutional	Transactional	Free-Market	NSI (Techno-Economic/ S3)	Chronological
3.0	Reimagined Urban Areas	Place-grounded	Social/ 3rd	Citizen	Cultural	Relational	Socio-Economic	Democratised (4H)	Inter-Temporal
4.0	Grassroots	Place-driven	Holistic/4th	Human	Mission	Directional	Ecosystem	Evolutionary (A Fourth Way)	Transcendental
Concept:	WHERE		WHAT	WHO	HOW		WHY		

Table 5.6 : Summary of ‘ A Fourth Way’ – Key Concepts

6. Conclusions & Recommendations

"Place is latitudinal and longitudinal within the map of a person's life. It is temporal and spatial, personal and political" - Lucy Lippard

(From 'The Lure of the Local, Senses of Place in a Multicentred Society' (1997)

6.1 Introduction

There is a clear tension between the fixed, static and bounded (primarily spatial and socio-economic) definitions which are widely applied to 'place' and the inherent fluidity and dynamism of the innovation process. Historically, this tension been alleviated – and arguably avoided – by employing only a very superficial understanding and expression of place in the development of innovation spaces. 'Urbanized science parks', the first typology of innovation district identified by Katz and Wagner (2014) and still the stereotypical 'go to' for places in terms of spatial planning for innovation, have traditionally shown little resonance with place and in many cases (including the cases of this typology explored in this research, such as Greater Manchester's Oxford Road Corridor) maintain both a cultural isolation and geographical distance from their respective urban cores.

Rather than attaching the confines of place to innovation, this research proposes that a better approach to alleviating the tension between the fixed parameters of place and the dynamics of innovation is to instead pursue a more dynamic, deeper and culturally aware understanding and practice of place. Presented in the research as a new taxonomy for 'place', the iterative flow toward this deeper understanding moves through 'place blind', 'place based' and 'place grounded' strategies, each of which are correlated in turn to Katz and Wagner's typologies of innovation district of 'urbanized science parks', 'anchor plus' and 'reimagined urban areas' (Katz & Wagner, 2014), to reach a 'place driven' model, envisaged as a 'grassroots', holistic, human, evolutionary and community-led expression of innovation.

The directionality associated with this flow is expansive and progressive, looking outward, onward and upward and, in being so, opposes both the 'fixed capital' paradox (Harvey, 2017) and the directional flow of globalisation, characterised by Harvey (2017) as a 'downward

spiral'. The research proposes instead an 'upward spiral' toward a shared 'mission' (Mazzucato 2017; 2020) survival, sustainability, evolution and the ongoing, infinite accumulation of *time*.

This new and holistic economic framing - presented here as 'A Fourth Way' - can be accessed only through evolutionary progress through the 'Third Space' (Bhabha, 1994 ; Soja, 1996). This third level space is correlated in the proposed place taxonomy with the innovation district typology of 'reimagined urban areas' (Katz & Wagner, 2014), the social and third sector and the 'Citizen Shift' (NCP, 2020) and is arguably the space in which society is currently operating, is marked by an increased awareness of interconnectivities and social systems. Passage to 'A Fourth Way', at the fourth level, can be 'unlocked' only by embracing a holistic cultural awareness (building on William's 1958 definition of culture as "a whole way of life").

The research is presented as new knowledge in contribution to the inter-disciplinary theoretical fields which sit within the place/innovation nexus (specifically including, but not limited to geography, economics, business studies, urban studies and social studies). Elevating culture, and specifically cultural heritage, brings significant implications for the theoretical paradigms of place and innovation and for policy and strategy making in the place/innovation nexus. These implications are discussed in the sections which follow, framed as conclusions in response to the four core research questions, and presented as the basis for a number of recommendations for future-focussed, evolutionary policy making.

6.2 A Place for Culture: The relationship between place, innovation and cultural heritage

Cultural heritage is the key to unlocking 'A Fourth Way' and its holistic, evolutionary vision. It is the route to a deeper, more complex and more dynamic understanding of place, which when achieved will liberate place from the 'fixed capital' paradox (Harvey, 2017) and which in turn will liberate innovation from the fixed parameters of place.

It is important to consider here the distinction between 'industry culture' and 'authentic culture', as put forward by Adorno & Horkheimer, 1947, and Pritchard's concept of 'artwashing' (Pritchard, 2019). 'A Fourth Way' cannot be unlocked by industrialised, commodified, orchestrated and, as explored in a number of the case studies within this research, appropriated expressions of culture, only 'authentic' expressions of tangible and intangible cultural heritage which, as UNESCO has acknowledged, "can only be heritage when it is recognized as such by the communities, groups or individuals that create, maintain and transmit

it – without their recognition, nobody else can decide for them that a given expression or practice is their heritage" (UNESCO, 2003). There is a distinct difference between the 'hyper-real', 'simulacra' of (Baudrillard, 1981) cultural experience presented by, for example, the "*uniquely bleached sub-culture*" of Amazon's South Lake Union campus in Seattle (Participant Q interview, 1st September 2016) and the authenticity of cultural heritage evident in the Granby/Toxteth community, where "*art has been at the heart of what we have been doing here since the 1980s. Some of it has been radical, protest art, some of it has been painful, some of it has been uncomfortable, but all of it has been real. Art has marked our defeats and our victories. There has been blood on the walls and art on the walls, but the walls are still here. We are still here*." (Participant K1 interview, 2nd December 2020).

6.3 Embeddedness

The criticality of this authentic expression of cultural heritage has, in turn, implications for the concept of 'embeddedness' which has been integral to the development of both the place and innovation paradigms, and their intersect. While the concept of embeddedness had been implicit in the paradigm of place since its introduction in Polanyi's "acts of barter embedded in long-range relations" (Polanyi, 1944), the pivotal point in terms of its explicit introduction into the innovation policy space came only in the 2010s, and specifically through Ketels' call for 'regional embeddedness' (Ketels, 2013b). Ketel's intervention, presented in riposte to regions selecting 'bandwagon' specialisms, has since acted as an ongoing, and as yet unmet, challenge to the innovation policy landscape to incorporate and demonstrate a deeper – and 'embedded' - understanding and expression of place.

While there is some resonance to be found between Polanyi's first use of the term and the embedded relations present, for example, in Liverpool's Granby/Toxteth community (where "acts of barter" at the monthly Granby Four Streets market might be said to be "embedded in long-range relations"), the framing of the concept within the idea of exchange, reciprocity and a market economy (albeit from an ideologically socialist stance) and his rooting of the related notion of 'networks' in "institutional analysis" (Becker, 2007) create a tension with the relational and distributed characteristics of the fourth (and third) level spaces in the proposed place taxonomy. A better fit can arguably be found in Granovetter's concept of agency "embedded in concrete, ongoing systems of social relations" (Granovetter, 1985). 'A Fourth Way' envisages, in effect, an expression of place and innovation which is embedded in

concrete, ongoing systems of *cultural* relations, and proposes that embeddedness can be found in the extent to which expressions of place and innovation resonate with the cultural heritage of the people and communities of that place.

Where is this is not evident, or where there is only a superficial reference to the embedded cultural relations and dynamics of a place, the expressions of innovation are at risk from a lack of cultural foundation (as evidenced, for example, by the demise of Liverpool Innovation Park).

6.4 Gaps and Challenges

Discord between expressions of place and innovation (including 'innovation districts' as the spatial manifest at their intersect) and the cultural heritage of a place, can result in gaps and challenges which, if not addressed, become increasingly pronounced over time. The four key challenges identified through the research are a lack of diversity in innovation spaces (principally racial and ethnic diversity, but also in terms of diversity of sex and gender), the unaffordability of housing and the correlated, but wider, challenge of homelessness, the related issue of persistent economic inequalities, and the pressing imperatives of climate change and the sustainability agenda.

A lack of racial and ethnic diversity is evident in a number of case studies, notably Boston, where as the Boston Globe notes, the population of the Seaport 'innovation district' is "is 3 percent black and 89 percent white" (Boston, 2017), as compared to the overall demographic of Boston, where 23% of the city's population is Black or African American and 10% identify as Asian (City of Boston, 2020). In Seattle, marginalisation in doubly evident. African American citizens make up just 6% of Seattle's population, but account for 29% of its citizens experiencing homelessness (City of Seattle, 2019). Unaffordability of housing is identified by almost a third of respondents to the survey undertaken in the research (by 29% of respondents at Impact Hub Seattle and 30% of respondents at The Federation). Homelessness has been identified by the Mayors of both King County (Seattle) and Greater Manchester as at levels of humanitarian crisis. Seattle's Pioneer Square area, featured in the case studies, has the city's highest concentration of start-ups and is home to Pioneer Square Labs, a start-up studio space established in 2015 and now worth over $27.5 million (Geekwire, 2021). It is also home to the city's highest concentration of City Missions and homelessness shelters.

There is a trend emerging in the research which suggests that proximity is a factor in district-level economic disparities and persistent inequalities. Pioneer Square Labs and the Union

Gospel City Mission homelessness shelter for men are on the same block in downtown Seattle. The Kensington district of Liverpool, one of the most deprived districts in England where 98.2% of its residents (approximately 14,000 people) are amongst the top 5% most economically deprived in the country (IMD, 2019) directly neighbours the Liverpool City-region's 'Knowledge Quarter'. Greater Manchester's Oxford Road corridor is bounded by the districts of Hulme, Moss Side and Rusholme, where 49%, 41.8% and 36.9% of their populations, respectively, live in poverty (Manchester City Council, 2019). 20% of Rusholme's population have South-East Asian heritage and 56.7% of the population of Moss Side identify as Black (Manchester City Council, 2019).

The inference might be drawn from these patterns of proximity that 'hyper-investment' in one district has a detrimental impact on the investment levels, and related poverty levels, of neighbouring districts. In terms of innovation policy, this would correlate with the assertion from Schott and Steinmueller (2018) that a continued focus on science and R&D and national systems of innovation is contributing to inequality (between in that case the Global North and Global South which, Schott and Steinmueller assert would not be the case if their 'Innovation 3.0' framing of socio-technical innovation was applied) and that by "picking winners, rent-seeking behaviour, corruption and lock-ins" (Grillitsch, 2016), current innovation policy – including S3 – is serving only to contribute to a widening gap in district and regional-level inequalities, and a related a persistence of the so-called European regional innovation paradox (Uyarra et al., 2018).

Clearly there are related implications for the fourth challenge identified through the research, that is, the pressing imperatives presented by climate change and sustainability. In short, inequality at district, regional and/or global scale is inherently unsustainable. At the same time, there is a clear and increasingly vocalised argument to suggest that persisting inequalities and the pursuit of economic growth at all costs, including at the expenses of the planet and other human beings, is the root cause of the sustainability challenge (see Raworth, 2017).

6.5 Measuring the Experience of Life

Raworth's 'Doughnut Economics' (Raworth, 2017) is just one in several models currently in development as 'alternatives' to the dominant economic system and its measurement through productivity, growth, competition and GDP. The Civic Investment index (CIV4.0) presented in this research was one of ten proposals published in the Global Indigo Prize for Economics

2017, which sought a new and more 'fit for purpose' system of measurement for current and future economies (Indigo Prize, 2017). The CIV4.0 index acknowledges the critical importance of sustainability by incorporating the UN's Sustainable Development Goals and seeks to establish and explore connections between global sustainability and individual health and wellbeing though also incorporating NEF's 'Five Ways to Wellbeing' (2008).

Importantly, in regard to the corresponding research question, which queries how the relationship between place, innovation and cultural heritage can be measured, the CIV4.0 index incorporates experiential measures of place, building on the three identified 'axes' of place put forward in the 'Sustainable Innovation Wheel' prototype which – critically – includes a cultural axis (in addition to socio-economic and spatial axes). In essence, the research proposes that the fluid and rapidly changing dynamics of innovation, place and cultural heritage can – and must – be measured through ongoing, human experience.

6.6 Implications for Economic Framing and Policymaking

Harvey describes the 'downward spiral' of globalisation as "the annihilation of space over time" (Harvey, 2017). This model, which has seen the stealth privatisation and associated attrition of public space (in both the physical and virtual realms), and in which space is commodified, commercialised, bought and sold, sits at the heart of the capitalist system. Conversely, and in direct oppose to the dominant globalised and capitalist paradigm currently at play, 'A Fourth Way' at its core priorities *time* over space.

The sustainability challenge which, at a base level, has seen the human species colonise and strip the planet's spaces and natural resources to the point of ecosystem collapse (see Raworth, 2017; Krznaric, 2020), demands a new economic framing in which human and planetary survival is prioritised. 'A Fourth Way' proposes that time is acknowledged as the primary and shared 'grand challenge' and global mission, building on Mazzucato's 'mission-oriented' model (Mazzucato, 2017; 2021).

This reframing, characterised here as an evolutionary model, has broad-reaching implications for policymaking and specifically for place and innovation policy. Firstly, the model presupposes and requires collaboration, over competition. In regard to place strategies, which in many cases attempt to set out the relative strengths of a place as 'competitive advantage' over other places, this requires a reframing instead toward to particular contribution a place can make toward the shared mission. Innovation policies, including S3, are similarly predicated on

‘competitive advantage’ and will need to be reframed toward the ‘competitive advantage’ of the whole, supporting and fostering the shared application of innovation capacity toward shared, global challenges. In this new and inherently generative model, the extractive concept of ‘productivity’ is reframed as contribution.

Secondly, there is a need to reframe and underscore place and innovation policy as supporting strategies for diversification, in all the broad senses of that word. Hassink and Gong (2019) note a “fuzziness” based on a “confusing and conceptually chaotic” misinterpretation of S3 as a vehicle for further (and more limited) specialisation as opposed to “diversified specialisation” (Hassink & Gong, 2019). The authors cite Grillitsch’s critique of a “debased” entrepreneurial discovery process (Grillitsch, 2016) as a key factor in how this misinterpretation is manifest in practice. ‘A Fourth Way’ proposes that the route to diversification, to a more open discovery process, and to addressing the gaps and challenges around marginalisation of individuals and communities (particularly on the basis of racial and ethnic marginalisation, but also apparent in terms of sex, gender and financial status), is through embedding innovation policy and strategy in (drawing from Granovetter, 1985) the concrete and ongoing *cultural* relations of place.

Transcendence of the “delineated boundaries” (Derrida, 1972) of space in this way, and by extension, avoiding the associated margins and peripheries, brings the third critical implication, which is that policy must seek to transcend the delineated time boundaries of its own policy cycle. The “short term risk-taking” identified by Foray (2015) as a design principle in S3 is at odds with what Krznaric (2020) calls the “pathological short-termism” of our current political cycles, “short-term consumerist mores and growth-fixated economic model”. The impacts of this short-termism on place are evident in, for example, the border town of Dumfries in Scotland, where Participant X says that the town has “*For too long… suffered from the impacts of fragmented property ownership, greed and short-termism, where developers have focussed only on immediate and short-term investment outcomes with little regard for the wider impacts for Dumfries or for the people of Dumfries*” (Participant X interview, 10th January 2017).

Krznaric calls instead for a ‘deep time humility’ and “promoting greater intergenerational justice, guided by the transcendent goal of creating a world in which the needs of future generations can be met with the resources on our finite planet – ‘one-planet thriving’ – should be a major goal of anyone aspiring to become a good ancestor. If people just don’t care, we’re doomed.” (Krznaric, 2020). In doing so, he foregrounds both the notion of heritage and

ancestry, with the related implication that the culture of today is the cultural heritage of a 'future now', and the importance of care. For too long, innovation policy has been allowed to operate at risk, with a care-free "regenerative shedding" (Foray, 2015) and scant regard for "unintended negative consequences" (Rissola, 2017). 'A Fourth Way' challenges policy to care.

6.7 Recommendations for Policy and Industry

The author makes the following 'top line' policy recommendations to foster and catalyse a collective transition and evolution toward 'A Fourth Way':

1. **Mission: Time**

Time – and its fundamental links to human and planetary survival, sustainability, wellbeing and resilience - should be explicitly recognised as the primary shared mission for the global economy and related policy making,

2. **Collaboration over Competition**

Both place and innovation policy should be reframed to embrace an inherently generative, rather than extractive, economic model and in doing so should seek to support collaboration over competition and to underpin a new definition of 'productivity' as contribution to the shared global mission.

3. **Distribution**

The 'unintended negative consequences' of spatially restricted innovation policies should be more widely acknowledged and addressed. Innovation policy should instead support open, distributed models which transcend spatial manifest as 'innovation districts' (and the associated 'unintended negative consequences') and instead seek to support innovation as a broad-scope and distributed process.

4. **Diversification**

On a related point, the need for diversification in innovation policy should be underscored, both in terms of a focus on diversification in support of strengthened innovation capacity (as originally intended by the S3 process) and in pro-active diversification policies to support a wider range of people and communities who are engaged in the innovation space (in pursuit of achieving 'match' with the cultural demographics of place).

5. **Embeddedness in Cultural Heritage**

Innovation policies should seek to resonate with and embrace the cultural heritage of place, and to achieve embeddedness in the concrete, ongoing *cultural* relations of place. This could be achieved by co-created innovation policies and strategies, working by, with, of, and for the people and communities of place. Given its criticality, at a broad strategic level, there should be explicit reference to culture and cultural heritage in, for example, the UN's Sustainable Development Goals (which is currently absent).

6. **Measuring Experience**

Metrics and measurements should seek to capture the 'lived experience' of place, cultural heritage, innovation and the dynamics at their intersect. The CIV4.0 framework proposes a prototype model for dynamic and experiential measurement of economic performance and progress.

7. **Open Access**

Equal value should be attributed to all members of the community of place. This should be extended to access to innovation spaces which, even in those cases which present as 'open innovation' spaces, continue to – however inadvertently - marginalise people and communities (particularly on the basis of race and ethnicity, and financial status).

8. **Community Anchors**

Participatory approaches to planning and co-created strategy should identify those spaces which are embedded in communities and cultural heritage and which, as such, might have the capacity to act as anchors in addressing structural weaknesses (which limit innovation absorption capacity). Both Participants U1 and V1 reference libraries in interview, with Participant V1 describing the "*network of local libraries"* as *" like a ready-made, locally rooted, nationally distributed innovation campus waiting to happen*". (Participant U1 interview, 14th January 2021; Participant V1 interview, 15th January 2021).

9. **Beyond Buildings**

Participant V1 observes an *"obsession with universities building buildings for this research or that theme or that area of study…They are building these things as palaces of knowledge but end up becoming mausoleums. We <u>don't need any more</u> buildings".* (Participant V1 interview, 15th January 2021). Given the stresses on land use (as demonstrated by Detroit's Future City

project), the need for affordable housing and the contribution of 'new build' to the carbon footprint, place-driven innovation policies should, where possible, seek to integrate the innovation offer in the existing spaces of that place.

10. **Applied Capacity**

The stark disparities between 'innovation districts' and their neighbouring districts and urban centres mean that it is not an unusual experience to observe vast levels of investment and financial wealth in extraordinarily close proximity to poverty, disinvestment and neglect. There is evidence of this phenomenon in all of the case study city-regions. The bridges which mark the route in the initial section of Manchester's Oxford Road, for example, as it leaves the city-centre and moves toward the universities and Manchester Science Park serve as shelter for a number of Greater Manchester's 8,000 citizens experiencing homelessness (BBC, 2020). There is a clear moral and humanitarian case to be made for applying place-driven innovation capacity to addressing these inequalities and social challenges.

6.8 A Fourth Way: A Portal from this world to the next

Historically, pandemics have forced humans to break with the past and imagine their world anew. This one is no different. It is a portal, a gateway between one world and the next. We can choose to walk through it, dragging the carcasses of our prejudice and hatred, our avarice, our data banks and dead ideas, our dead rivers and smoky skies behind us. Or we can walk through lightly, with little luggage, ready to imagine another world. And ready to fight for it.

- Arundhati Roy, 2020

Application of these principles as a new, holistic and place-driven innovation policy framework should mean that we are better prepared and have a strengthened capacity to meet the ongoing challenges of the COVID-19 pandemic and to navigate our way through emergence and evolution to a next stage of being. With great challenge comes great opportunity. 'A Fourth Way' offers an opportunity to transcend the delineated boundaries of space and time, and to promote a new and democratised approach to innovation, at the heart of an inclusive, and place-driven economy.

This is the innovation economy, liberated. This is 'A Fourth Way'.

7. Reflections, Impacts & Application

7.1 Reflections

Reflecting on the research, two factors loom large – and they have had an equally seismic effect on each other. They are the COVID pandemic and *time*.

Time, which has emerged as so critical to the research and its findings is also, on reflection, the source of its primary limitations. Although a sizeable breadth and depth of research was achieved in the available timeframe, exploring approaches from across the world and incorporating some one-hundred and thirty semi-structured interviews, the scope of both the challenge and the potential opportunity combine to suggest that further time, and further study, would only further enrich the research. There is rich potential to further develop the CIV4.0 index, particularly in further exploration and testing of specific indicators and metrics, and specifically of *experiential* indicators and metrics (building on the test scoring exercise for experiential indicators undertaken in the research as part of the 'M4' project; see Section 4.6.1). Given the dynamic nature of those experiential indicators, a programme of longitudinal study could be useful in determining and appraising changing factors, contexts, responses and experiences as an exploration of the experience of place over time.

In keeping with the dynamics of the place/innovation nexus, as set out and discussed in the research and its conclusions, there is an opportunity to further explore 'real time' data gathering, mapping and visualisation (building on the work undertaken by the University of Salford's School of the Built Environment and Think Lab teams as part of the 'IT Living Platform' project, as referenced in Section 5.5.1). The rapidly changing relational and contextual dynamics in which the world is operating necessitate constant and consistent data monitoring and upkeep. Problems arise, again as noted in the research principles and its conclusions, when there is an imbalance in dynamics, resulting in gaps, challenges and an ever-increasing tension between stasis and change.

Specific challenges faced during the research include a necessary change in the selection of a case study area, namely substituting the Greater Manchester city-region for the Raleigh/Durham area as an example of an "urbanized science park" typology (Katz & Wagner, 2014), following two failed attempts to undertake fieldwork visits to North Carolina. The visits were made impossible in the first instance because of a far-right rally and in the second instance due to a hurricane. Interestingly, these factors correlate to two areas emerging in research as

key gaps and challenges for innovation ecosystems – diversity and sustainability. Each of these areas presents opportunity for further interrogation and in-depth study in their own right (beyond the scope of the research).

A general challenge faced during and beyond the research has come in the form of the COVID-19 pandemic which has, as in many and arguably in all aspects of life, brought sweeping, large-scale, disconcerting and discombobulating change. A second phase of case study, focussing on the Liverpool City-region, and a second round of expert interviews was undertaken during the pandemic and its associated 'lockdowns' in order to cross-check emerging findings from the first phase of research, and as an attempt to ensure contextual relevance in the wake of the pandemic. This has in turn created issues with time, both on a prosaic level in terms of completion, but also with an additional time pressure as attention turns to future policy development to support recovery and resilience and as the arguments presented by 'A Fourth Way' for a holistic economic model based on principles of connection and care become ever-more pertinent, relevant and – arguably – necessary.

7.2 Impact

Proposals around 'A Fourth Way' have been widely communicated and well received. Emerging findings have been the subject of two TEDx talks delivered by the author – the first in October 2017 at TEDx Birmingham (one of the biggest TEDx-es in the country, with a theatre audience of over 2,000 people) and the second at TEDx Chester in February 2018). The concept of 'A Fourth Way' (in relation to citizenship and inclusive growth) was presented to a UK Government Future Cities Catapult roundtable meeting in London in October 2017 and to House of Lords Select Committee on Citizenship and Civic Engagement in November 2017.

In December 2017, The Civic Investment Value Index (CIV 4.0) model was highly commended and published in the ‘top 10’ entries to the Global Indigo Prize for Economics.

Emerging results from the research have at several key points been presented to senior representatives from the European Commission, and its Smart Specialisation (S3) platform. A sketch of the ‘Sustainable Innovation Wheel’ prototype was presented to EC advisor Desislava Kolarova at the MAPS-LED Mid-term Evaluation Meeting (Boston, USA, 26th and 27th July 2016). The framework based on the emerging place hierarchy was presented to EC and MAPS-LED colleagues at the MAPS-LED international workshop in Rome in December 2016, and emerging proposals around ‘A Fourth Way’ were presented to EC and MAPS-LED colleagues at the Salford conference in 2017 (which was co-designed and co-Chaired by the author). Proposals were also presented at the corresponding 2017 University of Salford International Postgraduate Research (IPGRC) Conference.

Papers based on the research have featured in a number of journals and prominent publications including:

- '*Spinning the wheel and switching on the lightbox: Towards a novel evaluation for Smart Specialisation'* published by Planum in a special edition of respected industry journal 'Urbanistica' to accompany the INU and Urbit conference "A New Cycle of Urban Planning between Tactic and Strategy", Milan, November 2016
- *'A fourth way: Cultural heritage and sustainable place-based development'* published in the 'On Sustainability' Research Network journal in January 2017, in contribution to its global conference in Rio de Janeiro.
- '*Citizens and Inclusive Growth*' produced in contribution to a joint project between The Royal Society of Arts (RSA) and Joseph Rowntree Foundation (JRF) and published in June 2017.
- '*CIV4.0'*, published in the Journal of Cultural Economy, February 2018
- '*A Fourth Way: Culture and the Fourth Industrial Revolution'* – published in the special edition journal 'After the Creative Economy', March 2018, The Centre for Understanding Sustainable Prosperity (CUSP)

Emerging results have also been presented to several international conferences including:

- Impact Hub '*Unlikely Allies'* Global Conference, Seattle, August 2016
- Project for Public Spaces '*Placemaking Week'*, Vancouver, September 2016
- 'On Sustainability Global Conference, Rio de Janeiro, Brazil, January 2017 (Poster)
- 'On Sustainability' Global Conference, Cairns, Australia, January 2018 (Emerging Scholar Award)
- Places for People: Innovative, Inclusive and Liveable Regions: The 58th European Regional Science Association (ERSA) conference, Cork, Ireland, August 2018

The M4 model was presented to an international audience of academic, public and private sector professionals with an interest in open innovation models at the Basque Government's Irekia 'Open Innovation' Summer School during a three-day session in San Sebastian, Spain in July 2017. The author was subsequently named as an Associate Research Fellow with the University of Basque's Agirre Lehendakaria Centre, a collaborative venture with Columbia University, New York which seeks to create transnational innovation partnerships.

A book based on 'A Fourth Way' and, specifically, its application to post-COVID recovery is currently in development with Palgrave Macmillan and is due for publication in 2021.

7.3 Application

Early findings from the research were fed into an anthology of work around 'Heritage, Identity and Place' (2016), convened by the Royal Society of Arts. The anthology was influential in shaping the Government's 2016 Culture White Paper and subsequent changes to heritage policy, resulting in the Heritage Fund's development and delivery of the 'Great Places' scheme. The concept of place has remained evident in national cultural policy since its emergence in the 2007 Lyon's review and, as demonstrated by the recent 'Levelling Up' agenda, has since extended its sphere of influence to economic policy. 'Pride in Place' is one of four key pillars in the forthcoming 'Levelling Up' White Paper (due Autumn, 2021).

The second phase of research has been delivered in the wake of the COVID-19 pandemic which has, as observed by Participant N1, "*elevated <u>care</u> as being absolutely integral to our social and economic fabric*" (Participant N1, interview 5th January 2021) and which has seen a piqued interest in new economic models, particularly those foregrounding care, connection and holism.

To some extent as a result, opportunities have arisen to apply some of the emerging principles from the research in practice, notably working with the Greater Manchester LEP in developing its proposals for 'Innovate GM', which envisages a distributed model of innovation across the Greater Manchester city-region, and working with the GM Mayor's Office, GM Culture team, the GM Health and Social Care partnership and its research partners at the Manchester Institute for Arts, Health and Social Change (based at Manchester Metropolitan University) to contribute to the GM Culture, Health and Wellbeing Study 2021 and to refresh the GM Population Health Plan 2021-7 as a 'place-driven' strategy with specific reference to culture. Both strategies are due for release following the May 2021 UK local and regional elections.

From April 2021, the author is commissioned to work with the 11 Local Enterprise Partnerships which cover the North of England, supported by Arts Council England, Historic England, The National Lottery Heritage Fund and the Environment Agency, as Strategic Lead for Place and Culture in the North of England, with the specific remit of mapping the North's rich and dynamic cultural and heritage assets as the basis for a Northern Strategy for Place. Lessons from the research will be used to shape the work, and to ensure a place-driven framework is applied to support future place and culture policy in the North.

Appendices

Appendix i: Questionnaire

Marie Sklodowska-Curie RISE
MAPS-LED Project

MAPS-LED
Multidisciplinary Approach to Plan Smart Specialisation Strategies for Local Economic Development

WP2
"Cluster Policy and Spatial Planning"
Interview Form

Project	MAPS-LED
WP	2_CLUSTER Policy and Spatial Planning
ESR/ER Name	
Unit	UNIRC ❑ SOBE ❑ FOCUS ❑ AALTO ❑
Host University	
Case Study	

Date _____ ESR/ER signature _____

About the MAPS-LED Project

- The MAPS-LED project brings together research teams from four European universities – Salford, UK, Aalto, Finland, and Reggio Calabria and La Sapienza, Italy and two US universities – Boston North Eastern and San Diego State.

- The project is supported by European funding through the Horizon 2020 programme.

- The focus of the MAPS-LED project is to examine smart specialisation strategies (S3), and in particular to assess how these strategies relate to place-based development. S3 is a strategic approach to economic regeneration adopted by the EU as a condition for member regions to access a number of European funding streams.

- S3 is closely related to cluster development, whose related policies have been broadly pursued in the US since the 1990s, but specifically promotes development of place-based economies at a local and regional level through a focussed concentration on agreed 'smart specialisms', based on distinct knowledge-bases, industrial and economic strengths.

- The MAPS-LED project broadens exploration of the S3 approach by examining the wider spatial, geographic, social, environmental and cultural aspects of place-based development, and considering how these aspects contribute and relate to S3.

- The project seeks to both evaluate current S3 programmes and to develop new and improved approaches to future S3 strategies, related policies and delivery.

- The project seeks to ascertain and map out how S3 relates to local knowledge and cultural identity, industry clusters, social networks and socio-economic needs and opportunities, and to demonstrate how all of these factors relate to potential for the production and use of innovation.

- The MAPS-LED project has four agreed work packages with the EU Horizon 2020 programme:

Work Package No. 2 – Cluster Policy and Spatial Planning

- This interview is being delivered in contribution to Work Package 2: Cluster Policy and Spatial Planning (WP2).

- WP2 seeks to build a sound and evidence-based approach to S3 through undertaking, producing and analysing a series of place-based case studies.

- Case study production and analysis will be conducted through a mix of quantitative and qualitative methods supported primarily by four analytical tools:

    - Survey – to provide insights on case studies from a mainly quantitative perspective.
    - Questionnaire – to provide insights on case studies from a mainly quantitative perspective.
    - Interview - to provide more in-depth and personalised insights on case studies from a mainly qualitative perspective.
    - Case Study Report – presenting the main results of the case studies.

- Findings from this interview will contribute specifically to one of the place-based case-studies and more generally inform our wider thinking on the development of S3 strategies.

The Interviewee

Details of the interviewee and role played in the company/ initiative/ organisation

Name			
Company			
Company Website			
Cluster/Sector	Biopharma❑ Business❑ Culture/Arts ❑ Education❑ Financial❑ IT ❑ Medical ❑ PR/Marketing❑ Public ❑ Voluntary/Charity ❑ Other: …….		
Company Type	Start Up ❑ SME ❑ Company/Corporate ❑ Consultancy ❑ Soc Ent ❑ Other……...		
Role played in the company	Founder ❑ President/VP ❑ CEO/ Director ❑ Freelance ❑ Academic ❑ Other/Title: ……		
	Year of foundation:	Year of involvement:	
Target area	Global ❑ National ❑ Regional ❑ City-Region/County ❑ City❑		

The Questionnaire

PLEASE TICK A MAXIMUM OF THREE BOXES PER MULTIPLE-CHOICE ANSWER

SECTION 1. The Innovation District

1. Which are the key spatial, social and economic factors and facilities that attract you/your company/organisation/project to this building/area?

   Education ❑ Housing ❑ Cultural Offer ❑ Green/Public space ❑ Transit/Transport ❑

   Other/Details: ……

2. Can you describe what makes this area an 'innovation district'?

   Start-ups ❑ Corporates ❑ Networks/Collaboration ❑ IT/ BioPharma ❑ Universities ❑

   Other/Details: ……

3. How is the area's distinct identity manifest in the social/cultural experience?

   Start Up Scene ❑ Networking ❑ Cafes/Retail ❑ Arts & Culture ❑ Social Connections ❑

   Other/Details: ……

4. How does your company interact with and contribute to that culture?

   Mentoring ❑ Charity/Volunteering ❑ Collaboration ❑ Sponsor Arts ❑ Sponsor Events ❑

   Other/Details: ……

5. Is your presence within the innovation district oriented to a specific need for innovation in your company?

   Tech Product ❑ Tech Process ❑ Tech Support ❑ Grads/Staff ❑ Funding/Finance ❑

   Other/Details: ……

6. How does your company produce and use innovation?

   Ideation ❑ Design ❑ Development ❑ Product ❑ Process ❑

   Other/Details: ……

7. How do you measure the production and use of innovation?

   Sales ❑ Users ❑ Members/Subscribers ❑ Profits ❑ Product/Process Improvement ❑

   Other/Details: ……

SECTION 2. Infrastructure

8. Who are the key players for supporting a successful innovation district?

   Public ❑ Private ❑ Third ❑ Academic ❑ Citizenry ❑

   Other/Details: ……

9. To what extent does your company contribute to social inclusion and equality? (Please tick one box)

   Not at all ❑ To Some Extent ❑ Moderately ❑ Often ❑ Always ❑

   Other/Details: ……

10. How important do you think infrastructural and environmental connectivity is to catalysing innovation? (Please tick one box)

    Not at all ❑ Mildly Important ❑ Important ❑ Very Important ❑ Critical ❑

    Other/Details: ……

11. To what extent do you feel engaged in strategic decision-making related to the area's infrastructural and environmental development? (Please tick one box)

    Not at all ❑ To Some Extent ❑ Moderately ❑ To a Large Extent ❑ Fully ❑

    Other/Details: ……

SECTION 3. Interaction and Engagement

12. How often does your company engage with innovation hubs, accelerators and co-working spaces? (Please tick one box)

    Never ❑ Rarely ❑ Sometimes ❑ Often ❑ Always ❑

    Other/Details: ……

13. How often does your company interact with other companies in the area? (Please tick one box)

    Never ❑ Rarely ❑ Sometimes ❑ Often ❑ Always ❑

    Other/Details: ……

14. How often does your company work with research institutes/ think-tanks/ consultancies? (Please tick one box)

    Never ❑ Rarely ❑ Sometimes ❑ Often ❑ Always ❑

    Other/Details: ……

SECTION 4. Gaps, challenges and threats

15. From your experience, are there any current or emerging gaps, challenges or threats to the area's innovation ecosystem? (MAX of 3)

    Graduate Supply ❑ Lack of cultural facilities ❑ Unaffordability of housing ❑

    Lack of Green/Public Space ❑ Transport/Infrastructure Issue ❑

    Other/Details: ……

For the Interviewer - Notes on the interview

Description of the interview and notes – to be recorded within 24 hours of the interview.

Appendix ii: Ethical Approval

Research, Innovation and Academic Engagement Ethical Approval Panel

Research Centres Support Team
G0.3 Joule House
University of Salford
M5 4WT

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23 June 2016

Dear Clare,

RE: ETHICS APPLICATION ST16/112 – The role of cultural heritage in embedding S3 oriented strategies

Based on the information you provided, I am pleased to inform you that your application ST 16/112 has been approved.

If there are any changes to the project and/ or its methodology, please inform the Panel as soon as possible by contacting S&T-ResearchEthics@salford.ac.uk

Yours sincerely,

Prof Mohammed Arif
Chair of the Science & Technology Research Ethics Panel
Professor of Sustainability and Process Management,
School of Built Environment
University of Salford
Maxwell Building, The Crescent
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Appendix iii: Survey Results

S = Seattle Impact Hub, July 2016 (50 respondents) GM = The Federation, July 2017 (57 respondents)

QUESTION	PERCENTAGE RESULTS						TOTAL
1. Which are the key spatial, social and economic factors and facilities that attracted you/your company/organisation/project to this building/area?	Education	Housing	Cultural O	Green/Pu	Transit/Transport		
S	27	14	20	17	23		100
GM	19	18	29	18	17		100
2. What makes this area an innovation district?	Start-ups	Companie	Networks	IT/BioPha	Universities		
S	23	13	27	13	23		100
GM	32	12	28	9	19		100
3. How is the area's distinct identity manifest in the social/cultural experience?	Start-up S	Networkir	Cafes/Ret	Arts/Cultu	Social Connections		
S	21	28	19	15	17		100
GM	26	25	20	12	18		100
4. How does your company interact with and contribute to that culture?	Mentoring	Charity/V	Collabora	Sponsor A	Sponsor Events		
S	24	15	29	15	17		100
GM	25	19	29	13	15		100
5. Is your presence within the innovation district oriented to a specific need for innovation in your company?	Tech Prod	Tech Proc	Tech Supp	Grads/Sta	Funding/Finance		
S	15	32	10	22	21		100
GM	20	26	15	26	13		100
6. How does your company produce and use innovation?	Ideation	Design	Developm	Product	Process		
S	14	21	23	14	27		100
GM	18	12	18	25	26		100
7. How do you measure the production and use of innovation?	Sales	Users	Members	Profits	Product/Process Improvement		
S	17	13	13	27	29		100
GM	21	13	21	29	16		100
8. Who are the key players for supporting a successful innovation district?	Public	Private	Third	Academic	Citizenry		
S	20	19	17	28	17		100
GM	23	18	22	23	13		100
9. To what extent does your company contribute to social inclusion and equality?	Not at all	To Some E	Moderate	Frequentl	Always		
S	0	40	30	30	0		100
GM	0	44	26	12	18		100
10. How important do you think infrastructural and environmental connectivity is to catalysing innovation?	Not at all	Mildly Imp	Important	Very Impo	Critical		
S	0	32	44	14	10		100
GM	0	18	47	32	4		100
11. To what extent do you feel engaged in strategic decision-making related to the area's infrastructural and environmental development?	Not at all	To Some E	Moderate	To a Large	Fully		
S	10	44	42	4	0		100
GM	12	39	40	9	0		100
12. How often does your company engage with innovation hubs, accelerators and co-working spaces?	Not at all	Rarely	Sometime	Often	Always		
S	0	0	14	6	80		100
GM	0	0	16	5	79		100
13. How often does your company interact with other companies in the area?	Not at all	Rarely	Sometime	Often	Always		
S	0	0	10	80	10		100
GM	0	0	21	65	14		100
14. How often does your company work with research institutes/ think-tanks/ consultancies?	Not at all	Rarely	Sometime	Often	Always		
S	8	18	50	24	0		100
GM	4	12	60	21	4		100
15. From your experience, are there any current or emerging gaps, challenges or threats to the area's innovation ecosystem?	Graduate	Lack of Cu	Unaffordal	Lack of gre	Transport/Infrastructure Issue		
S	19	15	29	21	16		100
GM	12	15	30	26	18		100

Appendix iv (a) : Delphi Results – Mean & Percentage

M4 DELPHI RESULTS						
	MEAN AND PERCENTAGE					
Which are the key spatial, social and economic factors and facilities that attract you/your company/organisation/project to this building/area?	Education	Housing	Cultural O	Green/Pu	Transit/Transport	
2017	9.0	8.0	10.0	1.0	2.0	30
%	30	27	33	3	7	100
2018	6.0	8.0	10.0	6.0	0.0	30
%	20	27	33	20	0	100
2. What makes this area an innovation district?	Start-ups	Companie	Networks	IT/BioPha	Universities	
2017	10.0	2.0	10.0	0.0	8.0	30
%	33	7	33	0	27	100
2018	10.0	3.0	9.5	0.0	7.5	30
%	33	10	32	0	25	100
3. How is the area's distinct identity manifest in the social/cultural experience?	Start-up S	Networkir	Cafes/Ret	Arts/Cultu	Social Connections	
2017	5.0	3.5	10.0	9.5	2.0	30
%	17	12	33	32	7	100
2018	7.0	6.5	5.0	5.5	6.0	30
%	23	22	17	18	20	100
4. How does your company interact with and contribute to that culture?	Mentoring	Charity/V	Collabora	Sponsor A	Sponsor Events	
2017	4.0	3.0	10.0	2.0	2.0	21
%	19	14	48	10	10	100
2018	5.0	7.5	10.0	3.0	3.5	29
%	17	26	34	10	12	100
5. Is your presence within the innovation district oriented to a specific need for innovation in your company?	Tech Prod	Tech Proc	Tech Supp	Grads/Sta	Funding/Finance	
2017	3.0	4.0	8.5	2.5	7.0	25
%	12	16	34	10	28	100
2018	5.0	5.5	9.0	3.0	7.5	30
%	17	18	30	10	25	100
6. How does your company produce and use innovation?	Ideation	Design	Support	Product	Process	
2017	2.0	4.0	8.5	5.0	4.5	24
%	8	17	35	21	19	100
2018	3.0	3.5	9.5	6.0	7.0	29
%	10	12	33	21	24	100
7. How do you measure the production and use of innovation?	Sales	Users	Members	Profits	Product/Process Imp	
2017	5.0	5.0	6.0	6.0	8.0	30
%	17	17	20	20	27	100
2018	4.5	5.0	5.0	7.5	8.0	30
%	15	17	17	25	27	100

8.Who are the key players for supporting a successful innovation district?	Public	Private	Third	Academic	Citizenry	
2017	6.5	5.5	5.0	5.0	8.0	30
%	22	18	17	17	27	100
2018	5.0	5.0	6.5	6.5	7.0	30
%	17	17	22	22	23	100
9.To what extent does your company contribute to social inclusion and equality?	Not at all	To Some E	Moderate	Frequentl	Always	
2017	0.0	2.0	2.5	5.5	0.0	10
%	0	20	25	55	0.00	100
2018	0.0	2.0	0.5	7.5	0.0	10
%	0	20	5	75	0	100
10. How important do you think infrastructural and environmental connectivity is to catalysing innovation?	Not at all	Mildly Imp	Important	Very Impo	Critical	
2017	0.0	0.0	0.0	6.0	4.0	10
%	0	0	0	60	40	100
2018	0.0	0.0	0.0	5.5	4.5	10
%	0	0	0	55	45	100
11. To what extent do you feel engaged in strategic decision-making related to the area's infrastructural and environmental development?	Not at all	To Some E	Moderate	To a Large	Fully	
2017	0.5	5.5	4.0	0.0	0.0	10
%	5	55	40	0	0	100
2018	0.0	3.5	6.5	0.0	0.0	10
%	0	35	65	0	0	100
12.How often does your company engage with innovation hubs, accelerators and co-working spaces?	Not at all	Rarely	Sometime	Often	Always	
2017	0.0	0.0	0.5	0.0	9.5	10
%	0	0	5	0	95	100
2018	0.0	0.0	0.0	0.0	10.0	10
%	0	0	0	0	100	100
13. How often does your company interact with other companies in the area?	Not at all	Rarely	Sometime	Often	Always	
2017	0.0	0.0	6.0	4.0	0.0	10
%	0	0	60	40	0	100
2018	0.0	0.0	2.5	7.5	0.0	10
%	0	0	25	75	0	100
14.How often does your company work with research institutes/ think-tanks/ consultancies?	Not at all	Rarely	Sometime	Often	Always	
2017	2.0	6.0	2.0	0.0	0.0	10
%	20	60	20	0	0	100
2018	2.0	4.0	4.0	0.0	0.0	10
%	20	40	40	0	0	100
15. From your experience, are there any current or emerging gaps, challenges or threats to the area's innovation ecosystem?	Graduate	Lack of Cu	Unaffordal	Lack of gr	Transport/Infrastructur	
2017	1.5	1.5	8.5	9.5	9.0	30
%	5	5	28	32	30	100
2018	1.0	2.0	9.5	9.5	8.0	30
%	3	7	32	32	27	100

Appendix iv (b): Delphi Results – Raw Data

M4 DELPHI - 2 ROUNDS - MAY 2017/ MAY 2018 - 10 ANON RESPONDENTS							
1. Which are the key spatial, social and economic factors and facilities that attract you/your company/organisation/project to this building/area?	Education	Housing	Cultural O	Green/Pu	Transit/Transport		TOTAL
2017 A	8	7	10	2	3		30
2017 B	10	9	10	0	1		30
2018 A	7	8	10	5	0		30
2018 B	5	8	10	7	0		30
2. What makes this area an innovation district?	Start-ups	Companie	Networks	IT/BioPha	Universities		
2017 A	10	2	10	0	8		30
2017 B	10	2	10	0	8		30
2018 A	10	3	10	0	7		30
2018 B	10	3	9	0	8		30
3. How is the area's distinct identity manifest in the social/cultural experience?	Start-up S	Networki	Cafes/Ret	Arts/Cultu	Social Connections		
2017 A	5	4	10	9	2		30
2017 B	5	3	10	10	2		30
2018 A	7	6	6	6	5		30
2018 B	7	7	4	5	7		30
4. How does your company interact with and contribute to that culture?	Mentoring	Charity/V	Collaborat	Sponsor A	Sponsor Events		
2017 A	4	3	10	2	2		21
2017 B	4	3	10	2	2		21
2018 A	5	7	10	3	4		29
2018 B	5	8	10	3	3		29
5. Is your presence within the innovation district oriented to a specific need for innovation in your company?	Tech Prod	Tech Proc	Tech Supp	Grads/Sta	Funding/Finance		
2017 A	3	4	8	2	8		25
2017 B	3	4	9	3	6		25
2018 A	5	5	9	3	8		30
2018 B	5	6	9	3	7		30
6. How does your company produce and use innovation?	Ideation	Design	Support	Product	Process		
2017 A	2	4	8	5	5		24
2017 B	2	4	9	5	4		24
2018 A	3	3	9	7	7		29
2018 B	3	4	10	5	7		29
7. How do you measure the production and use of innovation?	Sales	Users	Members,	Profits	Product/Process Improvement		
2017 A	5	5	7	6	7		30
2017 B	5	5	5	6	9		30
2018 A	5	5	5	7	8		30
2018 B	4	5	5	8	8		30
8. Who are the key players for supporting a successful innovation district?	Public	Private	Third	Academic	Citizenry		
2017 A	6	6	5	5	8		30
2017 B	7	5	5	5	8		30
2018 A	5	5	6	7	7		30
2018 B	5	5	7	6	7		30

9. To what extent does your company contribute to social inclusion and equality?	Not at all	To Some E	Moderate	Frequentl	Always		
2017 A		2	3	5			
2017 B		2	2	6			
2018 A		2	1	7			
2018 B		2		8			
10. How important do you think infrastructural and environmental connectivity is to catalysing innovation?	Not at all	Mildly Im	Important	Very Impo	Critical		
2017 A			6	4			
2017 B			6	4			
2018 A			6	4			
2018 B			5	5			
11. To what extent do you feel engaged in strategic decision-making related to the area's infrastructural and environmental development?	Not at all	To Some E	Moderate	To a Large	Fully		
2017 A	1	5	4				
2017 B		6	4				
2018 A		4	6				
2018 B		3	7				
12. How often does your company engage with innovation hubs, accelerators and co-working spaces?	Not at all	Rarely	Sometime	Often	Always		
2017 A			1		9		
2017 B					10		
2018 A					10		
2018 B					10		
13. How often does your company interact with other companies in the area?	Not at all	Rarely	Sometime	Often	Always		
2017 A			6	4			
2017 B			6	4			
2018 A			3	7			
2018 B			2	8			
14. How often does your company work with research institutes/ think-tanks/ consultancies?	Not at all	Rarely	Sometime	Often	Always		
2017 A	2	6	2				
2017 B	2	6	2				
2018 A	2	4	4				
2018 B	2	4	4				
15. From your experience, are there any current or emerging gaps, challenges or threats to the area's innovation ecosystem?	Graduate	Lack of Cu	Unaffordа	Lack of gre	Transport/Infrastructure Issue		
2017 A	2	2	8	9	9		
2017 B	1	1	9	10	9		
2018 A	1	2	10	9	8		
2018 B	1	2	9	10	8		

Appendix v: Word Frequency Content Analysis (Key Search Terms x 15) – Results

WORD FREQUENCY CODING RESULTS - WEIGHTED %AGE										
	Number of interviews:	15	15	45	10	10	10	15	10	130
	PH 1 CASE STUDIES	BOSTON	SEATTLE	GM	EXPERTS 1	M4 DELPHI 2017	M4 DELPHI 2018	LCR	EXPERTS 2	OVERALL
INNOVATION	0.357	0.089	0.077	0.192	0.064	0.093	0.072	0.097	0.112	0.128
PLACE	0.172	0.008	0.008	0.023	0.051	0.059	0.068	0.074	0.097	0.119
EMBEDDED	0.010	0.002	0.002	0.006	0.001	0.007	0.002	0.003	0.003	0.007
SUSTAINABLE	0.211	0.010	0.015	0.052	0.019	0.035	0.061	0.071	0.079	0.068
CULTURE	0.086	0.004	0.008	0.017	0.070	0.041	0.035	0.091	0.083	0.040
HERITAGE	0.067	0.006	0.004	0.011	0.020	0.050	0.032	0.083	0.078	0.040
HISTORY	0.086	0.008	0.006	0.011	0.006	0.002	0.008	0.016	0.042	0.027
ART	0.096	0.006	0.008	0.017	0.032	0.031	0.037	0.068	0.008	0.041
SPACE	0.278	0.019	0.017	0.040	0.023	0.039	0.052	0.080	0.031	0.109
SOCIAL	0.287	0.015	0.027	0.046	0.043	0.081	0.045	0.071	0.085	0.108
NETWORK	0.354	0.054	0.036	0.051	0.010	0.029	0.038	0.025	0.022	0.041
ECONOMY	0.220	0.015	0.017	0.046	0.031	0.036	0.035	0.073	0.091	0.076
COMMUNITY	0.153	0.010	0.011	0.029	0.086	0.061	0.059	0.087	0.087	0.081
HOUSING	0.134	0.016	0.010	0.034	0.033	0.073	0.041	0.079	0.082	0.105
DIVERSITY	0.124	0.008	0.016	0.034	0.037	0.038	0.037	0.074	0.053	0.041

Appendix vi: Coding used in Case Study and Expert Interviews

CODE	DATE OF INTERVIEW	SENIORITY LEVEL	SECTOR	ORGANISATION/FIELD
A	08/12/16	CEO/Director	Civil Service	GM Economic Development
A2	18/1/17	CEO/Director	Civil Service	GM Economic Development
A3	4/3/17	Senior Executive	Public/ Local Authority	Manchester City Council
A4	14/12/16	CEO/Director	Private	Independent Business (SME)
A5	7/6/17	Mid-level	Independent	Journalist
B	13/12/16	Senior Executive	Civil Service	GM Economic Development
B2	18/4/17	Senior Executive	Civil Service	GM Inward Investment (MIDAS)
B3	18/4/17	Senior Executive	Civil Service	GM Inward Investment (MIDAS)
C	13/12/16	Senior Leader	Civil Service	GM Local Enterprise Partnership
C2	5/8/17	Senior Leader	Private	Large Createch Business
C2	18/8/17	Senior Leader	Private	Global Corporate (IT)
C3	8/9/17	CEO/Director	Private	Mid-Large Creative Enterprise
D	4/1/17	Senior Executive	Public/ Local Authority	Salford City Council
E	4/1/17	Senior Executive	Public/Local Authority	Salford City Council

E2	15/2/17	Senior Leader	Private/Public Partnership	Media City, Salford
E3	20/2/17	Elected Leader	Combined Authority	Salford
F	12/1/17	Senior Executive	Private/Public Partnership	The Sharp Project (Creative Sector)
F2	12/1/17	Executive	Private/Public Partnership	The Sharp Project (Creative Sector)
F3	4/1/17	Senior Executive	Civil Service	GM Innovation
F4	3/12/17	Executive	Private/Public Partnership	Wayra Incubator, Oldham (Tech/Comms)
G	15/2/17	CEO/Director	Private	Independent Business (SME)
H	15/2/17	Senior Executive	Co-operative	Co-op Digital, Manchester
I	8/7/16	Senior Executive	Public Sector	Boston Mayor's Office (Arts & Culture)
J	9/7/16	Senior Executive	Public Sector	Cambridge Regeneration Authority
J2	16/7/16	Executive	Academic Sector	MIT (Property Office)
K	16/7/16	Senior Executive	Public Sector	Cambridge Regeneration Authority
K2	9/7/16	Executive	Private/Public Partnership	Kendall Square Development Corporation
K3	9/7/16	Executive	Public Sector	Cambridge Regeneration Authority
L	23/7/17	Senior Executive	Public Sector	Boston Redevelopment Authority
L2	23/7/17	Executive	Public Sector	Boston Redevelopment Authority
L3	8/7/16	Mid-level	Private/Public Partnership	MassChallenge

L4	14/7/16	Senior Executive	Public/Private Partnership	Boston Redevelopment Authority
M	23/7/16	CEO/Director	Private/Public Partnership	Venture Café CIC
N	10/8/16	Senior Executive	Public Sector	KC Mayor's Office (Policy & Innovation)
O	17/8/16	Senior Executive	Public Sector	KC Mayor's Office (Arts & Culture)
P	25/8/16	Senior Executive	Private	Vulcan Real Estate
Q	1/9/16	CEO/Director	Private	Pioneer Square Incubator Space
R	4/9/16	CEO/Director	Charity	Alliance for Pioneer Square
S	9/11/16	Senior Executive	Public Sector	Leeds GovJam
T	17/11/16	Senior Executive	Public Sector	Ajuntament Barcelona (Urban Planning)
U	14/10/16	Senior Executive	Public/Private Partnership	Detroit Future City
V	2/12/16	Senior Executive	Public Sector	Helsinki 'Innovative Cities' Programme
W	9/12/16	Senior Executive	Public/Local Authority	HackLab Rio
X	10/1/17	Mid-level	Charity/ CIC	MidSteeple Quarter CIC
Y	18/1/17	Director/CEO	Charity/ CIC	Everyone, Everyday Project
Z	3/2/17	Director/CEO	Charity/CIC	Connecta Cultura
Z1	8/3/17	Director/CEO	Charity/CIC	Heart of Glass, St Helens
A1	15/3/17	Senior Executive	Public/Local Authority	Wigan MBC

B1	15/3/17	Artist	Independent	The Fire Within, Wigan
C1	2/10/20	Senior Executive	Private	Sci-Tech Daresbury
D1	10/10/20	Senior Executive	Public/Private Partnership	KQ Liverpool
E1	16/10/20	Director	Public/Private Partnership	Baltic Development Corporation
F1	6/11/20	Director	Private	Independent Business (SME)
G1	24/10/20	Director	Private	Independent Business (SME)
H1	11/11/20	Director	Private	Independent Business (SME)
I1	20/11/20	Director	Charity/CIC	Holt Road CIC
J1	9/12/20	Director	Charity/CIC	Love Wavertree CIC
K1	2/12/20	Artist	Independent	Granby 4 Streets
L1	17/9/20	Senior Leader	Public/Private Partnership	L8 Place
M1	15/12/20	Senior Executive	Charity/CIC	Liverpool Biennial
N1	5/1/21	Director	Private	Independent Business (SME)
O1	5/1/21	Elected Representative	Combined Authority	LCR Combined Authority
P1	15/1/21	Senior Leader	Private/Public Partnership	GMLEP
Q1	19/1/21	Senior Executive	Private/Public Partnership	Cumbria LEP
R1	22/1/21	Director	Charity	People's Powerhouse

S1	6/1/21	Senior Executive	Public/Private Partnership	Northern Powerhouse
T1	14/1/21	Director	Private	Independent Business (SME)
U1	14/1/21	Senior Executive	Civil Service	CLGU
V1	15/1/21	Senior Executive	Civil Service	DCMS
W1	16/1/21	Senior Executive	Academic	UCL

Glossary of Key Terms

Community

A collective of individuals sharing a common location, attitude, belief or interest.

Culture

The ideas, customs, behaviours, arts, skills, intellectual product, knowledge, belief, laws, customs and way of life of a community or collective.

Cultural Heritage

Inherited traditions (relationships, practices, rituals, events, knowledge and skills) and built structures (buildings, monuments and sites) that are acknowledged as having importance and/or are valued by, to and for a community.

Embeddedness

The quality or state of being deeply linked, inter-related and/or interdependent to or within a sphere of activity, environment, context, structure, institution, organisation, logic or rules.

Entrepreneurial Discovery

A process in which actors scan for opportunities to produce and use innovation and to implement innovation processes.

Innovation

The act or process of implementing a new method or idea.

Innovation Districts

Defined and bounded geographic areas within an urban economy in which there is a marked concentration of firms who identify as producing and/or using innovation and innovation processes.

Place

A geographical location connected to individual or collective emotional and/or sentimental meaning.

Policymaking

The process of producing a set of rules, laws, ideas or plans that is used as a basis for making political, economic, planning and investment decisions.

Smart Specialisation

A policy framework designed to support regional areas to identify, enhance and scale potential areas of competitive advantage through research and development.

Space

A boundless extent formed of height, width and depth.

Sustainability

The ability to be maintained at a certain level, commonly applied in current usage to the capacity for the planetary biosphere and human civilisation to co-exist.

Time

An ongoing, measured or relational period in which actions, processes, events or occurrences exist or continue.

References

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