

Manchester Digital Strategy:

Creating an Inclusive, Sustainable and Resilient Smart City

Revised copy for continuing consultation. January 29th 2021.

CONTENTS:

- 1. Inclusion, Imagination, Industry: a new Digital Vision for Manchester**
- 2. Smart People: digital inclusion and skills at the heart of the Digital Strategy**
- 3. Digital Places: supporting smart people and a smart inclusive society**
- 4. Future Prosperity: digital enabling the smart inclusive economy**
- 5. Sustainable Resilience: digital innovation supporting zero carbon goals and inclusive connectivity**
- 6. Inclusive Recovery: implementing and delivering a Manchester Smart City Action Plan**

Annexes:

- 1: Manchester Smart City Action Plan: draft framework**
- 2. List of Manchester case studies and supporting documents**
- 3. Smart City Data Charter: the “Eindhoven Principles”**
- 4. Case studies of City Digital Strategies and Smart Cities initiatives from the UK and globally**
- 5. Manchester Digital Infrastructure Toolkit proposal**
- 6. Acknowledgements: list of organisations and networks involved in consultation to date**

1. Inclusion, Imagination, Industry: a new Digital Vision for Manchester

1.1 Overview

The new **Manchester Digital Strategy – Creating an Inclusive, Sustainable and Resilient Smart City** aims to set out a new vision and commitment for using digital technologies to enable a smart city. This is a working title and part of the next phase of the consultation process includes asking for suggestions for the wording for this headline.

This is a strategy for the city as a whole, as well as providing a strategic framework for the City Council's own digital transformation. It is based on four key elements which provide the foundation for the Strategy:

- a) **Smart people:** ensuring that everyone can gain and sustain the skills, aspirations and confidence to fully participate in the digital world; providing the basis for Manchester becoming an inclusive, diverse, successful and ethical smart city;
- b) **Digital places:** digital neighbourhoods providing access, connectivity and support for all residents and businesses and digitally enabling enhanced health and wellbeing;
- c) **Future prosperity:** enabling the digital economy and ecosystem to grow, continue to attract new digital businesses & sectors and support a resilient and inclusive economy;
- d) **Sustainable resilience:** using digital imaginatively for innovation to meet zero carbon goals and to create open inclusive connectivity with enhanced digital infrastructure as a utility not just a commodity.

Manchester has a very strong and resilient digital sector and ecosystem and is acknowledged as “**the UK’s second technology city**”, consistently outperforming “all cities outside of London” (The Data City, 2019). This is significant not only in terms of the scale of the sector but also in terms of its scope in covering both established and emerging technologies and providing a talent pool of digital and creative skills supporting consistent growth across all parts of the sector. The recent Tech Nation report 20 “UK Tech for a Changing Nation” demonstrates the particular strengths of certain parts of the sector in Manchester, including Service Design, eCommerce, Cyber, AI and Data Science, as well as in advanced materials. At the same time Manchester is at the core of a strong local digital ecosystem, with start-up and scale-up support networks, its own trade association with Manchester Digital, skills providers, user groups and tech meetups and events. Manchester’s digital strengths impact on many other sectors as well, being at the forefront of innovation for traditional manufacturing, construction, retail and product & service design sectors. Manchester is also a centre for research and innovation around the idea of “Industry 4.0” especially in advanced manufacturing, robotics and automation and this is already stimulating thinking around the idea of “Industry 5.0”, with the intention to link this to ideas of a more people-centric development of industrial digitalisation.

Digitalisation continues to have a major impact in public service delivery, especially in local government, health and education, which also drives growth in the digital sector as well as demand for digital skills and the need for inclusive pathways into new employment and training opportunities for all residents and businesses. The Covid-19 pandemic has highlighted the need for a new and innovative digital agenda for Manchester. This needs to take account of the impact that the pandemic has had not only on all aspects of digital life and work but also on the way that digital technologies and services have started to meet the challenges posed by the pandemic. This is why the digital sector has an even more important role in helping Manchester to continue to grow and thrive through a proactive approach to inclusive recovery.

The **Manchester Digital Strategy** aims to provide a vision of how Manchester can become an inclusive and resilient Smart City over the next five years. At the same time the strategy proposes a programme of new initiatives and projects that can help to achieve this through a **Manchester Smart City Action Plan**. This will enable digital inclusion and skills, smart neighbourhoods, digital innovation for business and jobs and digital resilience to support our zero carbon aspirations. In addition there is a new commitment to make digital infrastructure and connectivity more resilient so that it really can operate as an open access utility and not just as a commodity. This is a Digital Strategy which is about Manchester as a place; it is about everything in our city,

including the role of digital businesses, the City Council, Universities and the many partners and stakeholders which made the city work.

The **Digital Strategy** aims to provide the vision and framework to realise Manchester's ambition to be a world leading Digital City within the next decade, aligned with the **Our Manchester Strategy**, especially in terms of helping us to achieve key aspects of the connected city and liveable city themes by increasing digital inclusion. At a wider level it aligns with the **UK Industrial Strategy** in terms of the "grand challenges" set out in this strategy including those around mobility, sustainable growth, ageing population. It also aligns with the City Council's **Our Manchester Industrial Strategy** and the **GM Local Industrial Strategy (LIS)**.

The new **Digital Strategy** is based on the results of engagement and discussion with partners and networks across the city during the past year. The overall focus is on Manchester the place while recognising that this will also be a key enabler for Manchester City Council itself in terms of digital transformation. This work also takes into account the recommendations from a report commissioned by the City Council by ARUP providing an external overview of Manchester's current digital policies and strategies, including the lessons to can be learnt from case studies of other cities' Digital Strategies from across the UK and globally.

We are working to ensure this work aligns with the **Culture Recovery Plan** and the **GM Digital Blueprint**. It is encouraging to see the commitment to this alignment at the city-region level, where GMCA are also committed to aligning their work with the Manchester Digital Strategy, including using a similar focus for priorities with the emphasis on "**Smart People, Smart Places and Smart Prosperity**".

1.2 Learning from Manchester's digital experience and expertise

Manchester's digital ecosystem is central to the city's continuing economic success. In addition the digital sector is showing itself to be proactive and resilient in rising to the challenges of the Covid-19 pandemic, as well as highlighting challenges which need to be addressed urgently especially digital inclusion and infrastructure. Consequently, the new **Manchester Digital Strategy** is able to take advantage of the wide range of knowledge and expertise of digital innovators, entrepreneurs and activists which make up our local digital ecosystem as well as the results of the ARUP work, and the evaluation of the CityVerve project. The **Digital Strategy** is about creating a vision for Manchester's digital future with a set of clear commitments and descriptions of the programmes, projects and initiatives which will enable us to achieve this. This involves innovative uses of digital technologies to support the transformation of the many aspects of the city that make us uniquely Manchester. It is about making a digital difference so that we can sustain jobs, skills and prosperity as we build a more resilient and inclusive City economy.

The strong foundations of Manchester's digital experience are highlighted in the ARUP report and the work done to date on the Digital Strategy, including:

- the scale and scope of digital business in the city providing a critical mass for the growth of jobs, skills and innovation;
- the lessons learned from recent major projects including Triangulum, CityVerve and SmartImpact;
- the collective expertise in the grass roots networks of digital innovators, entrepreneurs and activists raising and developing critical questions around ethical, diversity and access issues;
- the strength of the innovation ecosystem, especially in local universities and their partnerships with businesses and the wider community, including innovative pathways to high level skills and talent;
- the importance of the legacy of digital initiatives over the past 30+ years, including the Manchester Host, Electronic Village Halls, Manchester Community Information Network, East Manchester Connected Community (EastServe), Telecities/Eurocities and Living Labs;
- Manchester's collaboration with other European cities on defining what a people-led and human-centric Smart City could and should be, see section 1.3 below.

The recommendations from the ARUP report provide a useful guide for the new Digital Vision and Strategy, including "four core recommended next steps":

- Creating a "shared vision statement" both for Manchester as a place and the City Council itself;

- Establishing a “Digital Office” by the City Council;
- Validating “the interventions” outlined in the report with the wider digital ecosystem;
- Developing individual work programmes.

The ARUP report includes other recommendations about the potential digital development of Manchester as a place as well as specific ideas for digital transformation by the City Council itself. These are being taken forward as the Digital Strategy develops focusing on the following areas:

- a) Leadership and governance: considering options for the function and form of new governance and delivery arrangements, including the proposed Manchester “Digital Office” and how these options could be resourced;
- b) Citizen enablement: innovative ways of using the digital transformation of the City Council’s services, including the role of data access and management, to promote new digital opportunities for community engagement and collaboration;
- c) Ecosystem: ways of building additional capacity which would make the digital ecosystem more sustainable and resilient in enabling inclusive recovery and reaching out to support all areas of the city;
- d) Planning and development: improving communications and cooperation between providers, developers, planners, communities and elected members, including embedding digital in the Local Plan and other planning frameworks, e.g. design guides and infrastructure toolkits;
- e) Promotion, branding and marketing: ensuring that there is clear “digital narrative” for Manchester and that this is used effectively across all channels of communication and user engagement.

These recommendations highlight the way that Manchester is seen to be at a critical point in its digital transformation journey. By considering Manchester’s ambitions both before and during the pandemic there is a recognition that there is an urgent need for Manchester City Council to mobilise both itself and its partners around a new and dynamic digital agenda in a much more coordinated way than ever before.

1.3 Smart people, digital places and future prosperity

The idea of a ‘Smart City’ is increasingly seen as needing to focus on ‘smart people’, a positive vision of building the digital skills, capacities and aspirations of all residents to play an active and fulfilling role in the digital world. This is also seen as a way of ensuring that technologies do not define what is “smart”, but rather should be at the service of people, so that decision makers should be able to use technologies in ways which improve services, communication and engagement. Initial feedback from the first stage of engagement with partners, particularly from the Voluntary, Community & Social Enterprise (VCSE) sector, highlighted the issue that the concept of smart people can often be misunderstood as being too much about technology and not enough about wider human attributes, including wellbeing, happiness and liveability. It is suggested that there should be more of a balance between digital as a general enabler and the specific opportunities, and challenges, for civic engagement and democracy being enhanced by digital. Questions that are currently being raised include:

- How can digital better enable people to organise themselves and to be more engaged?
- How can people who may never be able to be active digital users nevertheless benefit from it?
- How can we best learn lessons from using digital to tackle the challenges of the pandemic in the longer term, including tackling isolation and loneliness and wider health and wellbeing issues?
- What are the most appropriate digital tech applications and services to motivate those who are excluded?
- How can we identify and share the best practice of local digital initiatives, especially those being done by local self-help groups, charities and individuals?

Over the past ten years Manchester, both through the City Council and with local partners, has been working with other like-minded cities across Europe to identify good examples of policy, practice and experience that enable the implementation of a set of Smart City policies which focus on local residents, businesses and the digital ecosystem. Manchester’s main partners include Amsterdam, Barcelona, Cologne, Eindhoven and Helsinki and links continue with many others through networks such as Eurocities. Manchester hosted the most recent (virtual) conference of the Eurocities Knowledge Society Forum in September 2020. There has been a lot of discussion about what we mean by a “Smart City”, how this is differentiated from a history of top-down, tech led

initiatives and how we can generate more positive and engaging ways of involving people, businesses and the wider community in articulating new visions, strategies and practices that stress accessibility, diversity and key principles such as ethics and sustainability.

One shared vision that has come out of this collaboration is a definition of what we mean by a 'Smart City', as follows:

- **Smart Cities will have smart citizens at their heart**, enabling them to have the capacity and confidence to use state-of-the-art future internet technologies to transform the way they live and work and their quality of life.
- **Smart citizens will collaborate in new and dynamic ways**, co-owning new ways of planning and delivering services and co-producing services both for themselves and for those that they live with, care for and work with.
- **Smart economic and social opportunities for new ways of working and living**, where smart citizens in smart cities will use future-internet technologies to create new economic and social opportunities.
- **Smart digital solutions for making environments greener, cleaner and healthier**, as well as more open and inclusive.
- **Smart citizens ensuring that smart cities are more democratic, resilient and attractive**, using future internet-enabled services to generate and celebrate creativity, innovation and diversity, especially accessing, shaping and participating in arts and cultural experiences.

Based on the results of the **Smart Innovation & People (SmartIP) project led by Manchester**.

While the focus of Manchester becoming a Smart City is about the whole of the city we recognise that people live and work in local neighbourhoods, workplaces and open spaces. Our experience of the Covid pandemic has shown that not all of these places have the capabilities and capacity to ensure that everyone has accessible, affordable and equitable access to the digital world. This means that we need to focus more on ensuring that residents in every part of the city can have better access to digital services and connectivity. This requires a more proactive approach to mapping the assets we currently have available and to planning the roll out of digital infrastructure which is offered more as a utility than simply as a commodity. This is the thinking that underpins the proposals to create **smart places** as part of **digital neighbourhoods**, which can then support digital inclusion and diversity for all our residents and communities.

In becoming a **Smart City** Manchester will build upon the strengths of its existing **innovation ecosystem**, particularly the concentration as assets and talent that is based along the Oxford Road Corridor area, including the universities, the health campus and the MSP science and innovation park. As this part of the ecosystem continues to grow and develop around the city centre, with Circle Square, the new innovation district, "ID Manchester", on the North Campus site, together with Enterprise City (St John's) and developments in NOMA and the Northern Quarter, there is the potential for an enhanced networking approach as a distributed **smart innovation hub**. This could then be the basis for a city-wide network linking up with other innovation and regeneration initiatives across the city, including in North Manchester with the redevelopment of North Manchester General Hospital, in East Manchester, including Sport Tech, and Wythenshawe, including Wythenshawe Hospital and the Airport City Enterprise Zone.

The idea of "innovation districts" is increasingly being highlighted in national and local policy making as providing a catalyst for economic development and urban regeneration. This is a way of linking innovation (as an ecosystem) and place making and closely complements the "three pillars" of the **Our Manchester Industrial Strategy**, where the intersection of the focus on people, places and prosperity provides for the development of an inclusive economy. The **Digital Strategy** aims to take this a stage further by ensuring that the benefits of this approach can be realised by all local residents and businesses through smart places and digital neighbourhoods.

A number of the partners who have provided feedback on the early drafts of the Digital Strategy have emphasised the importance of "ethical tech" and ethics generally in the digital world, an area in which Manchester is playing a leading role. Alongside the work around "people-led smart city" development by the Responsible Tech Collective, ethical data issues by Open Data Manchester and the emerging work of the AI Foundry initiative being led by

Manchester Met University in partnership with the other local universities, there is growing expertise and talent in the city.

The issues raised by this work in this initial feedback include:

- The importance of considering ethical/responsible innovation at all levels;
- The ethical importance of public engagement and involvement especially around scrutiny and compliance;
- The ways in which ethical approaches can build trust and confidence in new services and products;
- Ethics as a key part of ideas of making a digital difference to what makes us uniquely Manchester.

The new **Digital Strategy** will be a key driver in identifying and supporting the delivery of projects and wider initiatives, which contribute to inclusive economic recovery, through digital neighbourhoods and community focused action to develop digital inclusion, digital skills and more fully accessible digital infrastructure. This is important for Manchester to become a leading smart city with a smart innovation framework which ties together its commitments to smart people, digital places and future prosperity. There are many digital opportunities for business and employment growth which will be able to provide new jobs and skills for local residents. The Manchester Digital Strategy aims to outline a number of proposed new initiatives which would operate within this new **smart innovation framework**. The working title for this is the **Smart Manchester Innovation Networking Enterprise (Smart MINE) programme** and this aims to provide the foundation for project development as part of a range of national and city-region funding programmes. This will also complement related proposals around social innovation, ethical tech and new digital mutual models.

<p>Smart People –</p> <p>Digital Inclusion</p> <p>Ensuring that all residents have understanding, skills and confidence in accessing the digital world;</p> <p>Being proactive in tackling digital exclusion and promoting digital inclusion and diversity;</p> <p>Continue to promote the importance of STEM subjects and job opportunities at all levels of the education system;</p> <p>Support the creation of more higher quality jobs and ways of working, ensuring advanced digital skills are available and accessible in all parts of the digital ecosystem;</p> <p>Digitally enabling the organisations and networks that residents, workers and visitors engage with;</p> <p>Providing access to digital skills to help safeguard existing jobs, enable people to create and access new jobs and support the creation of new businesses and new ways of working;</p> <p>Maximising the benefits of close collaboration between the digital and creative sectors and digitally enabling cultural recovery;</p> <p>Find new and innovative ways to create and sustain better quality work, ways of living and ensuring social value in all digital initiatives.</p>	<p>Smart Places –</p> <p>Digital Neighbourhoods</p> <p>Extending the highest quality digital connectivity so that it is accessible and affordable to all residents and businesses;</p> <p>Promoting innovation in all aspects of place-making and ensuring that all assets provide inclusive digital connectivity;</p> <p>Working closely with the voluntary, community and social enterprise (VCSE) sector to promote co-design and co-ownership of new digital assets, including through the expansion of the GM Digital Coop;</p> <p>Providing physical access opportunities in local neighbourhoods with connectivity, equipment, training and demonstration facilities;</p> <p>Supporting creative places and spaces with enhanced digital capacity and connectivity;</p> <p>Smart urban design to reimagine and repurpose buildings and public realm with digital connectivity to support recovery.</p>	<p>Smart Prosperity –</p> <p>Digital Innovation</p> <p>Working to create higher quality job opportunities, including with advanced digital skills, in all parts of the digital ecosystem and in all other sectors becoming more digitally enabled and resilient;</p> <p>Further develop the innovation ecosystem to scale up and deploy innovative smart digital infrastructure and capabilities across the city, including through the Living Lab approach of user driven open innovation;</p> <p>Maximise opportunities to continue to attract and to grow digital businesses and investment and to enhance the links between these and the digital talent pool across the city;</p> <p>Enabling future foresight through more human centric and ethical approaches to automation and digital production, including AI and ideas of Industry 5.0;</p> <p>Empowering arts and culture and the creative sector more widely through digital innovation and investment;</p> <p>Linking the innovation ecosystem, including Innovation Districts and Hubs and mutual innovation models, to the “place ecosystem” to support inclusive and sustainable prosperity.</p>
--	---	--

Smart Resilience – Digital innovation for a green new deal

- Digital innovation to underpin all of our zero carbon ambitions and goals
- Developing green audits of digital initiatives and digital audits of green initiatives
- Ethical resilience that focuses on responsible stewardship for the future
- Digital design to improve the public realm, creating new smart civic spaces, and improving the quality of life
- Data driven policies to improve urban environments, supporting health, wellbeing and liveability
- Digital infrastructure as a utility not just a commodity and developing new and innovative models for co-ownership and co-production of digital infrastructure
- Community based Wi-Fi provision supporting digital neighbourhoods and smart places
- Living Labs to support research and innovation in next generation smart connectivity
- Manchester as a test bed for wireless enabled Internet of Things (IoT) initiatives (LoRaNet, 5G etc.)

2. Smart People: digital inclusion and skills at the heart of the Digital Strategy

2.1 Making a digital difference for skills, diversity and inclusion

The **Manchester Digital Strategy** aims to offer ideas for actions to help to maintain the successes of the digital sector and ecosystem to date as well as to stimulate inclusive economic recovery in Manchester. The starting point is that **Digital Inclusion** and **Digital Skills**, supported by world-class **digital infrastructure** and connectivity must provide a foundation for growing and sustaining the **Digital Ecosystem**.

In many of the digital projects undertaken in Manchester it has often been said that it is smart people that really make a smart city and consequently **digital inclusion** and **digital skills** are essential prerequisites for smart city development. This means that all residents have the right to be supported to have the access, skills and motivation so that they are confident in going online to access the opportunities provided by the internet and digital services. Digital exclusion has a particularly discriminatory impact on BAME communities as well as on people with disabilities and those aged 65+. The Digital Strategy takes account of a wider analysis of the impacts on those residents facing additional barriers, including wider cultural exclusion and institutional racism, and will support a range of specific projects involving digitally enabled diversity, cultural inclusion and institutional change.

While Manchester has a good track record in tackling the digital divide and promoting digital inclusion, it is still estimated that at least 27,000 people in Manchester are digitally excluded. Not only is this unacceptable for reasons of social equity but also a factor in wider social exclusion in terms of access to jobs, skills and online services. It is estimated that there is currently a serious risk that those who are already experiencing these challenges will be left even further behind post-Covid-19. In addition, those areas with high levels of deprivation across the city have higher numbers of residents likely to be digitally excluded. This is why the idea of actively creating **smart places** and **digital neighbourhoods** will be so important in meeting these challenges as we build an inclusive economic recovery. In particular the highest priority will be given to ensuring the deployment of digital connectivity and equipment through securing resources for new digital initiatives and projects as outlined in the Manchester Economic Recovery and Investment Plan.

2.2 Manchester's Digital Skills Network and Digital Inclusion Action Plan

The Digital Strategy aims to provide further strategic and practical support for Manchester's **Digital Skills Network** and the **Digital Inclusion Action Plan**, helping to generate even wider support for these from the digital sector and ecosystem. These are focusing on enabling all Manchester residents to be engaged to gain the experience, confidence and skills needed to access the benefits of being online. Digital talent and ensuring greater diversity of talent is one of the key attractors for investment and economic growth in the digital sector. In particular, the Manchester Digital Skills Network already brings together over 200 creative and digital, and education and skills professionals, with a broad purpose of sharing good practice and collaborating on activity that tackles Manchester's digital skills challenge. The network was first convened in 2014 with the initial purpose of strengthening links between education and skills providers and industry leaders, in aim to better support young people into a career in digital. Since 2017 the network has broadened its scope to plan, collaborate and mobilise action around wider talent pipeline and skills challenges. This includes helping to increase the digital capability of those working age as well as creating clearer pathways into digital careers for all residents. Engagement with the Digital Skills Network and its participating organisations will be crucial in realising the aims and objectives of the Manchester Digital Strategy.

Manchester's digital skills ecosystem is well placed to continue to support this with universities, colleges, business and the VCSE sector working closely together to ensure that additional capacity can be created and delivered to support inclusive economic recovery. It is widely recognised that Manchester has a strong talent pool based on a growing workforce which is young, diverse and increasingly well-educated with the skills and capacities to support further growth in the digital/tech sector, attracting new investment and relocations. At the same time there are

skills shortages which are highlighted in Manchester Digital's annual Skills Audit, including specific shortages in areas such as DevOps and software engineering, which need to be addressed as a matter of urgency. In further developing Manchester's capacity to meet these challenges, a number of key objectives have been identified, including:

- building up more intelligence, data and evidence about digital exclusion faced by residents across the city to inform all aspects of the digital strategy and the practical delivery of projects;
- actively engaging with residents facing digital exclusion and organisations working with them to gain a better understanding of their challenges and opportunities and to translate this into practical ways of enabling them to access the internet and build their own digital capabilities and confidence;
- working closely with the voluntary, community and social enterprise (VCSE) sector to create more and better ways of reaching communities that remain digitally excluded and supporting the sector to develop their own workforce skills;
- enhancing the promotion of the benefits of digital access and engagement;
- developing new skills paths into digital from other sectors of the economy and for anyone already in digital facing unemployment or other barriers to continuing work in the digital economy;
- reinforcing employment and training access routes at entry level and working closely with schools, colleges and training providers;
- supporting all young people and staff in schools with the digital capacity to transform the ways that digital education is delivered, including continuing to promote the importance of STEM subjects and job opportunities at all levels of the education system;
- building on the work of the GM Digital Fast Track Workforce Programme to provide short and targeted programme to increase the number and range of people who can access careers in digital;
- continuing to work closely with universities and colleges to improve their capacity for producing digital talent which meets the needs of the sector in the short and medium term, as well as making sure that all graduates are digitally enabled and competent for any sector that they go to work in, as all are impacted by the digitalisation outlined in this strategy;
- working more effectively through new partnerships to engage businesses, universities and colleges in supporting digitally excluded residents more directly;
- developing new ways of including ethical tech issues, e.g. around AI, to raise awareness and critical thinking, especially in the workplace;
- considering how best to enhance the digital offer in lifelong learning, especially through adult education, workplace based training and worker education.

Manchester's vibrant **digital ecosystem** will need support as it finds ways to make businesses and skills training more resilient and sustainable as the digital sectors in the City continue to grow and digitisation affects most aspects of people's working lives.. As well as continuing to build upon existing partnership working at a local level, we recognise the importance of working with partners at city-region level, especially GMCA and the wider network of training providers at GM level to meet the digital skills challenge.

As well as safeguarding jobs and skills there is an urgent need to develop innovative and flexible ways of supporting those people whose jobs and skills will be under threat as some parts of the economy recover rapidly from the Covid-19 pandemic, while others do not. A more resilient supply chain for digital skills will be essential to meet the needs of new entrants to the labour market, as well as others who have become recently unemployed or underemployed. In addition, although the labour market is likely to remain challenging for some time, there is a need to focus on meeting the needs for advanced digital skills, as specialist sectors of the ecosystem continue to grow rapidly and require higher level technical skills

Through the intelligence and data gathering work within Manchester and at GM level, especially by MIDAS, Manchester's inward investment agency, we already know that one of Manchester's key strengths as a location for investment and jobs is the range of talent already available and the commitment that this supply can be increased through enhanced collaboration between the universities, colleges, training providers and business. In addition for those entering the digital sector, further support is needed to help people retrain, reskill and to develop the entrepreneurial skills they need to form their own businesses and networks.

In initial feedback from the consultation activities that are taking place for the Manchester Digital Strategy it has been suggested that it would be empowering for residents to have their own personal digital roadmaps, helping residents and groups of residents to visualise the potential journeys, both individually and collectively, towards digital confidence and aspirations. This would need support from multi-agency collaboration, including DWP/JCP, the City Council, training providers, VCSE organisations and local self-help groups, and should be linked into wider health and wellbeing work.

The Manchester Digital Strategy will be addressing **digital inclusion** and **digital skills** as top priority issues. In section 4 on “Future Prosperity” the Digital Strategy identifies those areas within the digital economy and have remained strong during the pandemic. It outlines some proposed approaches for ensuring that the supply of smart people can meet the demand for skills in key areas of the digital economy and contribute to inclusive recovery. One other important aspect of this is to align skills and labour market analysis with the intelligence we now have from the digital sector, including the new report from Manchester Digital on [“How Manchester’s Tech Sector is Tackling the Coronavirus Pandemic”](#).

2.3 Digital opportunities and challenges for inclusive recovery

The primary aim of the Digital Strategy in relation to supporting jobs and skills for future prosperity is to maximise the opportunities for new job creation in the digital economy while enabling all residents to gain access to the training and re-training that they may need to take advantage of these opportunities. While much of the focus is on adults, in terms of creating and safeguarding jobs in the digital sector and in taking account of digitalisation in all other sectors, the role of schools and colleges is also a priority. Recognising the importance of good digital education and the need for a wider range of pathways into careers in the digital economy, the Digital Skills Network commissioned a **High School Digital Audit** report in 2019. It should be noted that this work was carried out prior to the Covid-19 outbreak, following which education through digital and issues digital access became of much greater concern to schools.

The Digital Audit highlighted two inter-related themes to focus on:

- a) **Digital Working:** ensuring that the digital opportunities provided through schools are an effective preparation for pathways to further education and employment;
- b) **Digital Living:** linking these digital opportunities to the support that people need as effective preparation for digital literacy and “digital for life”.

The Digital Audit made a range of recommendations for future action, including:

- More support and capacity building for the digital skills of school staff;
- Enhanced support and guidance for school leadership, staff and Governors, on developing an effective digital strategy ensuring vision, commitment and delivery of a much broader digital offer;
- Building a range of additional options for learning digital skills beyond just Key Stage 3 (KS3) Computer Science GCSE particularly a broader digital offer at Key Stage 4 (KS4);
- Further strengthening of links between schools and industry and the wider digital ecosystem;
- Recognition that digital exclusion and social inclusion are interrelated so that tackling inequality and discrimination is at the core of driving digital inclusion;
- Enabling further work to be undertaken to analyse how independent learning skills can be enhanced around digital working and living together with new and innovative forms of assessment and quality assurance for all aspects of the digital offer.

In addition, there are opportunities to maximise the potential of the introduction of T-levels and the work that The Manchester College is doing to pilot these, building on the success of the college’s existing work with employers to ensure that all of their level-3 students have access to industry relevant work experience as part of their study.

The above recommendations are now more pertinent than ever, however, recognising that school timetables are crowded and that there are other places where young people can acquire the digital skills that will help them succeed in life, there is a growing number of extra-curricula and informal digital learning opportunities for young

people in the city. Additional collaborative work by training providers and youth organisations is revealing new challenges and opportunities for developing the digital skills offer for all young people across Manchester. One pilot project which provides an example of what can be done was the DIGIMAKERS initiative, developed by Young Manchester, HIVE, the Raspberry Pi Foundation and partners. This is one example of where training providers, community organisations and businesses can work together to pioneer new approaches and content to engage young people and develop new pathways into employment. While Manchester is a pioneer of work around 3D printing and digital making, first developed by the award-winning Manchester Digital Laboratory (MadLab) more than 10 years ago, there is now little community based provision, which is a challenge in terms of access and inclusion.

Together with the well-established CoderDojo activities, coordinated from the Sharp Project, there are opportunities for building further on the success of Code Clubs and developing a new generation of digital makers “FabLab” access centres and projects across the city. The new approach to “FabLab” style facilities needs to be focused on these being much more agile and accessible than previous projects, enabling them to be both technically and financially viable and sustainable. The eventual aim would be to have at least one digital makers facility in every area of the city, engaging with libraries and youth zones, and linked to the smart places digital neighbourhoods programme outlined in section 3 below. At the same more consideration needs to be given to how to make Coding Bootcamps more accessible and inclusive, including through new access level, pre-training opportunities, including more virtual bootcamps and improved access to innovation centres through outreach and engagement work.

In addition another proposal arising from these discussions is to establish a digital challenge “award” which would help young people find new learning opportunities in their community. The programme would aim to support learners in transforming what they’ve studied into **new skills, digital pathways and careers**, outside of the school curriculum, by working with local leaders, learning providers, and digital employers to find untapped sources of community education and transform local lifelong learning. The aim of a Manchester Digital Challenge Award would include:

- widening access to learning for all;
- preparing young people for work in new and innovative ways;
- providing an enhanced range of activities and experiences for learners;
- linking up with industry to enhance the skills offer;
- providing new incentives to create a workforce ready for a changing world of work;
- encouraging a more imaginative sense of place, identity, and ambition.

The Digital Strategy aims to align with and complement both the GM Digital Blueprint and the GM Work and Skills Strategy. In doing so it is important to acknowledge the importance of the analysis and recommendations provided in the recent GM “Industry Labour Market and Skills Intelligence Report” (<https://greatermanchester-ca.gov.uk/media/3918/industry-labour-market-skills-report-digital-tech.pdf>) as so many of the businesses, skills providers and networks are clustered in Manchester. The report’s recommendations around ensuring that there are more flexible routes into digital/tech industries and that “inclusivity should be embedded in all skills initiatives” are particularly important, as are the needs for innovative piloting of new initiatives such as ensuring that coding bootcamps are more accessible, e.g. with funding from GMCA/DCMS.

In summary, the Manchester Digital Strategy’s **Smart People** objective will:

- a) ensure that digital skills and inclusion are made the highest priority within all digital initiatives;
- b) be proactive in promoting digital inclusion, diversity and equality in delivering the Digital Strategy;
- c) promote enhanced skills progression from entry level to higher level and higher value opportunities;
- d) working to create higher quality job opportunities, including with advanced digital skills, in all parts of the digital ecosystem and in all other sectors becoming more digitally enabled and resilient;
- e) recognise the convergence between the digital and creative sectors and support closer collaboration between the sectors to enable new and innovative routes into opportunities for employment and skills.

3. Digital Places: supporting smart people and a smart inclusive society

3.1 Digital innovation and smart places

Manchester's strengths in research and innovation have long made the city a place of choice for investment and talent, particularly focusing on the universities and related research agencies and networks. At the centre of this innovation ecosystem is the Oxford Road Corridor linking together the universities, the health campus and the MSP science and innovation campus. This is now expanding into new spaces, including "ID Manchester" (previously the University of Manchester's North Campus), a range of sites in Spinningfields and St. John's together with key sites in NOMA and the Northern Quarter. Many parts of the innovation ecosystem are already actively engaged in the wider communities in which they are based, including providing access for local people and business to the experience and expertise that they have available. The challenge now is to build this capacity out even further, enhancing both the scope and the scale of this in order to reach out into every local neighbourhood across the city. The intention is to develop a network of **smart places** and **digital neighbourhoods** across the city, supported by new digital infrastructure and connectivity based on the maximum possible open access and useability (further outlined in section 5 below).

This thinking draws upon ideas of how to enhance liveability and wellbeing across all parts of the city in the context of the digital economy and digital world. In developing this Digital Strategy, and new ideas about how Manchester can be a different type of "smart city" which is more human-centric and based on smart people, digital places and future prosperity, it is clear that all areas of the city need to be able to benefit from this by being more connected and resilient. While the stakeholders and partners involved in these discussions to date have primarily a city wide remit they have all stressed the need to focus on local neighbourhoods and physical places where people live and work and to ensure that digital connectivity and services are enhanced on an equitable basis.

Since these discussions started in March 2020 the ideas and practical experiences provided by Manchester's rich digital ecosystem have provided a strong foundation for a new Manchester Digital Strategy, highlighting both the opportunities that a more inclusive digital economy could provide as well as the challenges to be faced, especially in terms of recovery. A full list of those organisations and networks which have responded to this first stage of engagement and discussion is given in Annex 6. This includes:

- **Manchester Digital:** the independent trade association for the digital sector;
- **Responsible Tech Collective/Tech for Good Live/Open Data Manchester:** People-led Smart City initiative and growing role of work on ethical tech, diversity and data ethics;
- **Manchester Central Library:** public engagement, digital inclusion and cultural networking;
- **Manchester's Technology & Innovation Centres:** including the two private sector led business incubation spaces, CityLabs, Manchester Technology Centre and the Sharp project;
- **Manchester College "EdTech Demonstrator":** supporting innovation in on-line learning;
- **Cooperative Network Infrastructure (CNI):** aka the GM Digital Coop, open access neutral host model for digital infrastructure;
- **Factory/HOME/Manchester Science & Industry Museum:** creative industries, arts & culture including performing arts and cultural heritage;
- **Future Everything:** creative innovation lab and cultural organisation;
- **School of Digital Arts (SODA) & Digital Innovation (Manchester Met University):** digital arts centre of excellence and digital production demonstration centre, including 3D printing and digital design;
- **Digital Futures/Manchester Urban Observatory/Creative Manchester:** University of Manchester research networking;
- **Cyber Foundry & AI Foundry:** led by Manchester Met University in partnership with the University of Manchester, Salford University and Lancaster University using their expertise to help defend, innovate and grow businesses and to enable Artificial Intelligence for innovation and growth;
- **Health Innovation Manchester and the Christabel Pankhurst Institute for Health Technology Research and Innovation:** partnerships led by the University of Manchester focusing on digital innovation.

Working with key partners and existing innovation spaces ideas emerged about how a **Smart Innovation District and Hub** could provide enhanced support for all areas of the city, working towards the potential for a networked 'virtual campus'. This involves ensuring that all existing smart locations can act as innovation hubs to support **digital neighbourhoods** across the city. This would be complemented by an active programme of connecting hubs and civic places and public spaces through **smart digital infrastructure**, including through new open **Digital Exchanges** which would, in turn, support clusters of connectivity across the city. This would mean incorporating community hubs, district centres and outreach initiatives so that all of these smart places are able to provide direct support for digital inclusion and diversity, including providing residents with accessible digital connectivity, training and demonstration facilities.

Digital places will also be a theme which will inform the physical regeneration of the city, including the public realm, supporting the wider aim of Manchester becoming a smart, connected and resilient city. This recognises the ways that changing lifestyle habits, changing climate and the changing role of public spaces play an important role in creating a smart city, enabling us to make innovative uses of digital technologies to transform the place that is uniquely Manchester. Feedback is also suggesting that much more could be made of leveraging existing and newly emerging data to drive innovation. The smart city is based on smart people and smart places being supported through inclusive economic recovery. The public realm, including street furniture, is an essential vehicle through which smart change can be driven in Manchester. Smart places allow people to connect wherever they are and however they want to, a critical factor in creating a city to compete with the world's best.

Creating a smart public realm with smart street furniture is one essential way of supporting this, providing advanced infrastructures enabling the best WiFi, data access and hosting sensors as well as disseminating information and visualisations through screens and displays. Flexible working also needs smart places, with street furniture supporting people to work wherever they need to and helping to animate the public realm. Smart places will also be climate resilient and adaptive, supporting the city's commitment to be a zero-carbon city with innovative ways to generate and use renewable energy. This means being multi-purpose, multi-functional, sustainable and, above all, future proofed.

3.2 Digital places being enabled through smart data and civic Innovation

Smart cities need to be able to generate, analyse and visualise data as a key asset in the digital world and to do this in ways that are both ethical and sustainable. This is particularly important for the City Council but it equally applies to all partners and stakeholders involved in the production and delivery of public services. Just as Manchester has developed a dynamic and effective digital ecosystem for business, skills and economic growth so too does it need to develop a data ecosystem to act as a key enabler of digital transformation. Manchester City Council is currently developing a new **Data Management Strategy**. This will primarily focus on the Council's own data management but will also start to set standards in which data and information relationships can be enhanced with key partners and stakeholder organisations across the city and beyond, including GMCA and making sure that there is alignment with the GM Digital Blueprint.

Manchester City Council's primary aim is "**to become a data-led organisation and ensure data is central to what we do**". This will include the adoption of a "**Smart City Charter**" as part of a new **Smart Data Initiative** focusing on open data, new data standards and data skills (see Annex 3). This will look at data access and use in ways that put privacy and trust at the centre of the city's data agenda, while enabling enhanced data sharing, partnership working and best practice, especially in terms of data quality and security.

Key areas of the Data Management Strategy will focus on:

- Ensuring **systems** are developed to conform to best practice and allow safe data management alongside excellent reporting capabilities that drive informed decision making;
- Ensuring we are growing capacity in our **workforce**, equipping them with the skills for now and in the future;
- Ensuring data is of **good quality** and is held **securely**;

- Ensuring **good data management and governance** principles are followed;
- Further developing our information and data sharing practices, embedding the “Eindhoven Principles”, to minimise risk whilst **enabling partnership** working and collaboration.

The implementation of the strategy will initially be over a two year period, developing alongside and interlocking with digital and ICT development during that period.

In addition the City Council’s commitment to social value and local sourcing will underpin new initiatives, for which funding is currently being sought, on **Smart Civic Innovation** with two proposed new initiatives:

- a) **Smart City Civic Innovation Programme:** promoting innovation around identified challenges emerging from the city council and other partners, with a fully supported innovation programme, which will bring together digital businesses and others with the public and third sector to pilot and scale civic tech solutions to address key themes, such as zero carbon, ageing society and urban mobility;
- b) **Smart Urban Data Discovery Platform:** this would build on the experience gained from previous projects, including Triangulum and CityVerve, and coordinating work to populate, secure, and exploit data more effectively, underpinning other digital initiatives in the city such as the Civic Innovation Programme, and the digital inclusion agenda outlined in section 2 above. This would utilise existing assets such as the GM Data Analysts group, as well as the UKCRIC funded Urban Observatory project at the University of Manchester.

These will enable new digital challenges to be aimed at SMEs, start-ups and social enterprises and help to build up their capacity to develop new applications and services with and for the City Council. More information about these and the other priority projects that resources are being sought to enable implementation as part of Manchester’s Economic Recovery and Investment Plan is provided in section 6.

The City Council and partners are continuing to work closely with **Open Data Manchester** to consider how best to support the implementation of the key themes in their new “Declaration for responsible and intelligent data practice” including common principles for commitments, collecting and using data, good governance, system design, procurement, knowledge sharing, open data and environmental impacts. There will be a coordinated effort to engage not only with all public sector partners but also businesses, both in the digital sector and more widely, to gain a city wide commitment and practical action on open data at all levels. Continuing support for Open Data initiatives and coordination of effort across the city-region with GMCA will be essential to reach a critical mass of capacity to ensure that this is done properly and also engages with all public agencies, including transport, health and education. At the same time there will be a focus on data which is held by business and private sector networks and how this can also be made available for intelligence and analysis of future urban development, planning and service delivery. This work is also being developed in the context of continuing city-region initiatives with GMCA, Open Data Manchester, AI Foundry and a wide range of other partners from the public, private and VCSE sectors.

3.3 Digital places enabling creative innovation

Digital places are also a central part of supporting Manchester as a **creative city**. To this end the Digital Strategy aims to enable new digital innovation in convergent sectors such as cultural and creative industries as well as supporting the **Culture Recovery Plan**. Large sections of the cultural and creative sector will take longer to recover and there is great scope for looking at ways that digital can support their recovery as well as finding imaginative ways to support specific areas, such as “live” performance, whose recovery remains challenging or even stalled. Supporting the Culture Recovery Plan through the Digital Strategy will be an important part of developing new creative spaces which can use digital to engage both existing and new audiences and to support artists and creatives, including with new skills. In particular the Culture Recovery Plan has a strong commitment to developing skills, inclusion and diversity and highlights the need for giving the creative sector “the chance for projects that support communities and artists who are prone to be excluded to recover and reimagine the future”. The plan also highlights the importance of libraries as “a major physical and creative resource” which “should play a major part in all dimensions of this recovery”.

The Covid-19 pandemic has deeply affected the arts and cultural sector and highlighted challenges in relation to digital development. These effects are expected to be fundamental and long-lasting and is accelerating the digital transformation of the sector. Looking ahead to the sector's recovery, there are some key areas in which digital will play a critical role. During lockdown, artists and arts organisations adapted to restrictions by streaming performances, making collections available online and using social media to engage with audiences and participants. Some individuals and organisations found it easier to adapt than others, due to varying levels of access to resources, equipment and skills. The same is true for their ability to monetise digital content. Manchester Museum, Manchester Camerata, Manchester International Festival (MIF), Contact, Hallé Orchestra, Manchester Art Gallery, HOME, People's History Museum amongst others provided rich online content such as streamed or recorded works, interactive participation material and immersive virtual world game play. This shone a light on the level of innovation in the sector. MIF's Virtual Factory is a prime example of creative innovation in this space and this is highlighted within the Digital Strategy as an exemplar of what can be achieved through imaginative thinking and delivery.

The sudden switch to digital delivery also presented barriers to those audience members and participants who lack access to digital equipment and data, the means to afford and the skills to utilise it. The wealth of digital artistic content which was made available will have also made it difficult for some customers to navigate the landscape of the new digital cultural offer. The continuing digital transformation of this sector is focusing thinking on future planning and delivery. If digitising, making available and monetising artistic products online was previously a costly proposition reserved for artists and organisations with access to the right resources and relevant skills, the changes have led to a greater number of artists and arts organisations relying on using digital as a means of reaching their audience.

During recovery and beyond, a blended online/in-venue approach to delivery of cultural content and engagement with audiences will be central to sustainable business models. This is not only due to the uncertainty of the environment but also because of the huge opportunity to reach new audiences, many of which have been developed during lockdown. This will require consolidation and further innovation from that part of the sector already on this path. Excluded artists and creatives need to be supported to re-skill and re-equip to enable them to catch up and bring their creativity to wider audiences.

In providing support as the sector emerges from the pandemic in a way that will enable it to thrive, we need a better distribution of access to digital resources and skills to level the playing field. While many art forms will always primarily depend on human interaction, the environment in which they are operating has changed for good and we will need to ensure that all artists and arts organisations can share in the opportunities that the digital transformation affords. The same applies to digital inclusion for audiences and participants. We need to safeguard the reach of the arts into our communities, and particularly to those residents who encounter barriers to access arts and culture digitally. In feedback to the earlier drafts of the Digital Strategy partners have highlighted a number of opportunities and challenges for rethinking the ways that creative content is generated, used and experienced in the digital world. It is suggested that the impact of digitalisation means thinking about significant changes in organisational structures, cultures and platforms. This is a key element of new collaborations with and within local universities, including the School of Digital Arts (SODA) at Manchester Met University and the Institute for Cultural Practices at the University of Manchester.

The digital transformation enables the sector opportunities to innovate practices, improve data management and marketing, measure impact, increase access and participation, and reduce carbon emissions, opportunities that should be available to all in the sector. **Digital transformation supports the city's Cultural Ambition 2016-26** and its aim "to be a coalition for cultural growth based on generosity: more open to collaboration; more open to communities; and more open to data-sharing and insight. We are open to changing how we do business to make more impact across Greater Manchester." It can also help us to fulfil Manchester's ambition to become "the UK's most culturally democratic city, engaging with a much greater number and diversity of people across Greater Manchester."

3.4 Vision, leadership and governance for digital places

The **Manchester Digital Strategy** aims to provide a new strategic framework for making Manchester, the place, a centre of excellence for new and innovative forms of digital inclusion, diversity and accessibility for all local residents and businesses through smart places and digital neighbourhoods. The strategy also focuses on ways that Manchester City Council itself can benefit from further digital transformation, together with its service delivery partners, especially in health and social care, education and housing. Continuing service improvements supported by digital transformation are an essential part of achieving an inclusive recovery. In order to support this Manchester City Council's new ICT Strategy will complement and enhance the Digital Strategy by focusing on digital transformation of the Council's own services, staff, assets and places.

This work will include further consultation work on establishing a **Digital Office** to provide leadership and coordinate work on the implementation and delivery of the recommendations of the Digital Strategy. There are a number of options for the operation and governance of such a Digital Office and these are explored further in section 6 on Implementation and Delivery, below. There will be an ongoing dialogue with the digital ecosystem (as outlined in section 3.1 above) including further consideration of how existing digital networks could be engaged in the governance arrangements for the development and operation of the Digital Office.

In summary, by developing **Digital Places** which will support local residents and businesses to engage with, shape and benefit from Manchester as a Smart City, the Manchester Digital Strategy will:

- a) Develop a Digital Office to support the implementation of the Digital Strategy;
- b) Roll out a programme to ensure the systematic upgrading of accessible digital infrastructure in every neighbourhood so that all residents, businesses and community groups have the access they need;
- c) Ensure that digital innovation is embedded in all aspects of place-making, including developing new digital assets to support smart civic spaces, public spaces and cultural facilities;
- d) Promote smart urban design enabling buildings and public realm to be reimagined and repurposed with digital connectivity and services which can, in turn, support a digitally enabled inclusive recovery.

4. Future Prosperity and Digital Innovation: digital enabling the smart inclusive economy

4.1 Digital innovation and the digital ecosystem

Manchester's success in building up such a strong and resilient **digital sector and ecosystem**, and its wide recognition as the most significant UK digital city or "technology city" (outside of London), owes much to the legacy of the prime mover internet businesses of the 1990s and their successor start-ups and scale-ups since 2010 as well as to the dynamism of current businesses, investors and networks. This has led to the local digital economy being incredibly diverse with some local eCommerce and tech businesses, especially those providing internet and data infrastructure, having been in business for more than 25 years while others are much more recent examples of inward investment and start ups. There are both specific strengths in particular parts of the sector, including Service Design, eCommerce, Cyber, AI and Data Science, as well as in advanced materials, as well as also in those parts of the digital sector which are at the forefront of innovation impacting on more traditional sectors, including manufacturing, construction, retail and product & service design.

There is an increasingly strong evidence base for **Manchester's digital strengths**, including work commissioned by MIDAS, together with GMCA, the LEP and the Business Growth Hub, particularly that from "[The Data City](#)" featured in the "[Greater Manchester Emerging Technologies Sectors. Sensemaking & Narrative Report](#)". This highlights how important Manchester now is in terms of combining its historic strengths in specific parts of the digital sector, including its digital talent pool, with new investment to support wider business growth, especially with start-ups and scale-ups. Tech Manchester has recently highlighted the number of (what they are calling) "furlough-preneurs" who have ideas for start-ups ready to start as soon as recovery begins, if not before. This is all creating a very strong marketing proposition for the city and city-region and is a catalyst for attracting both local and global investment.

The importance of **Manchester's universities** in providing the foundation for **digital innovation and research** and the talent pool to attract investment for future prosperity is highlighted in numerous reports, including in the Tech Nation Jobs and Skills Report where Manchester is recognised as the fastest growing "tech city" within Europe, having overtaken Cambridge for the first time as second only to London for venture capital investment in tech businesses. Alongside this Manchester has also been ranked as the top UK city for IT professionals to live and work (CompTIA UK Tech Town Index, 2019). New collaborative initiatives by local universities, including the Cyber Foundry, AI Foundry and the School of Digital Arts (SODA @ Manchester Met) further strengthen this foundation and the wider digital ecosystem.

Manchester is home to an emerging new wave of **ethical tech** businesses and **digital not-for-profits** which builds upon existing strengths of other pioneering initiatives including Future Everything, Open Data Manchester and the Manchester Digital Lab (MadLab). Manchester's new Digital Vision is drawing inspiration from the growing commitment to data ethics with GMCA coordinating work at city-region level, working in partnership with Open Data Manchester. Alongside this over initiatives are extending the ecosystem further, including the BBC's focus on **design ethics** across its digital portfolio, Thoughtwork's dedication to addressing **diversity** challenges and Reason Digital's work with The Trussell Trust and Alzheimer's UK on digital impact. Across the digital sector organisations are leading the way on tech being created with **communities, society and the environment** at the head of their ideas. Again, Manchester Metropolitan University and the University of Manchester are spearheading work to establish ethical AI practises and co-production techniques with disadvantaged communities, and in the third sector, Open Data Manchester, Ethics Kit and Innovate Her are making waves through evidencing more transparent, inclusive and sustainable approaches to working in the industry. This is led by Tech for Good Live (a globally renowned podcast and proactive local community dedicated to enhancing the charity sector's digital capabilities) and the Greater Manchester Responsible Tech Collective (initiating innovative projects to shape people-powered smart cities and ethnic equality in tech), Manchester's work in ethical tech is gaining national attention through partnerships with Luminate, the Social Tech Trust, Barclays and the Co-op Group, plus connections to international ethical tech initiatives of the likes of Les Halles Civiques in Paris (<https://hallesciviques.org/>) to New York's Civic Hall initiative (<https://civichall.org/about-civic-hall/>).

This wider digital ecosystem was already working in close collaboration before the Covid-19 pandemic hit, with the City Council and all of the city-region bodies working together with local universities, colleges and training

providers, Manchester Digital and the wide range of technology and innovation centres, incubators and accelerators across the city. This ecosystem has remained very robust throughout the pandemic and the totality of the support system provides for optimism for future recovery, the GM Industry Labour Market and Skills Intelligence Report (2020) reported that, during spring/summer 2020, *“although recruitment dropped consistently by a third overall due to COVID, Information and Communications vacancies remained the majority of roles on offer”*. The Digital Strategy, as one part of the city’s wider recovery plans, will be supporting work to identify what other support may be needed and how such support can be best be scaled up.

Current ideas for new and future work are also informed by Manchester’s strong track record of economic development based on digital innovation and the positive legacy of earlier projects, from the “Wired Up Communities” project which started in 2001 and provided affordable and accessible connectivity to over 3,000 households in East Manchester as a Commonwealth Games legacy project back to the Manchester Host computer communications and networking system, developed in partnership with Poptel, the first public access network of its kind in the UK, in 1991. Over the past ten years the experience gained from Manchester’s participation in European projects has also left a rich legacy of experience and expertise around the smart cities agenda with Manchester being a founder member of the European Network of Living Labs (ENoLL) launched in 2007 and the European Smart Cities Network in 2010. This includes the CivicTech initiative with Living Labs setting up a network of European cities, including Manchester, in 2014, to trial new challenges with SMEs, start-ups and social enterprises as incubators for new city applications and services, which has helped inform the proposed new Civic Innovation Programme. The Living Lab approach of “user-driven open innovation” is now well established and Manchester was one of the pioneers of this approach nearly 20 years ago, when it coordinated the EU funded Intelligent Cities projects with twenty partner cities across Europe, which provided a basis for major projects to be developed such as Triangulum and CityVerve in the past 5 years.

Securing a more resilient digital sector also means overcoming challenges and ensuring that we continue to build upon our commitment to digital inclusion and digital skills development, as outlined in section 2 (above). This is especially important as we consider how best to be more proactive as recovery disrupts the labour market with some jobs being lost before new ones are created, while at the same time ensuring that growth sectors gain access to the advanced skills that they need. The Digital Strategy recognises the social implications of the impact of some tech innovation, especially around accelerating automation, which may reduce the number of jobs in some areas before new jobs can be created. Already some parts of the innovation ecosystem are being more proactive in pre-empting and responding to this, including the pioneering work being done by local universities around moving from the concept of “Industry 4.0” to “Industry 5.0” to create more human centric and socially responsible uses of advanced technologies.

4.2 A smart city roadmap for future prosperity

Developing a **smart city roadmap** will be one of the key outcomes of the implementation of the Digital Strategy. This will build upon the networked approach to co-design and co-production of digital projects and initiatives as part of the implementation and delivery framework outlined in section 6 below. This will draw first and foremost upon the experience and expertise that is already there across the city but will also be working proactively to identify newly emerging collaborations and enterprises that are developing to support recovery with new applications and services. The aim is to ensure that the outcomes of the digital innovation and research taking place across the city can become more visible, accessible and useable. This draws upon the ideas put forward in the Responsible Tech Collective’s commitment for “adopting a **people-first approach** – looking to the **needs of people** and the **problems in the places** they live” and designing “SmartCity solutions that are purposeful, impactful and sustainable”. At the same time there is a growing recognition that social innovation is as important as technical innovation and wider issues of health and wellbeing, creating an age-friendly city and climate change must be an essential part of the smart city roadmap and action plan.

The Digital Strategy's **Future Prosperity** theme aims to build upon the focus on **digital places** by identifying key areas to promote further inclusive economic development in all parts of the city. This means that as well as continuing support for the current Corridor Partnership area, including the new Innovation District – “ID Manchester” and developments around “Enterprise City” in St John's, there will be other priorities for digital development in areas including NOMA and North Manchester, especially the proposed new development around North Manchester General Hospital, in East Manchester and in Wythenshawe, including the hospital, district centre and Airport City. This will be supported by the proposed extension to the Digital Cooperative's infrastructure, including (where possible) use of Metrolink tramside ducting connecting Wythenshawe, the Corridor area and North Manchester with new Digital Exchanges (DX) across the city (see section 5.2 below). At the same time, wider collaborations across the city region will be promoted, including through emerging work with the GM Digital Cooperative (led by Tameside), the Digital Skills Network in Stockport and the Salford Smart Cities initiative.

4.3 Digital innovation and the future of work

Digital innovation impacts on all aspects of the digital economy and ecosystem, covering a very wide field including web based services, augmented and virtual reality (AR/VR), the Internet of Things (IoT), Artificial Intelligence (AI), robotics, digital production (from 3D printing to additive manufacturing), intelligent optics and advanced wireless, bio-engineering and quantum computing. Manchester is already the base for many advanced research and innovation centres and these will play a crucial role in enabling the digital sector to continue to grow and to create jobs during recovery. Economic data being analysed by the City Council, GMCA and other GM wide bodies, especially the inward investment agency, MIDAS, highlights those key parts of the digital economy which are playing a central role in current and future growth, in spite of the pandemic. This includes Cyber, E-Commerce, FinTech, HealthTech, EdTech, Service Design and Software Development with other strengths in emerging areas, such as AI & Automation, Low Carbon Tech and Ethical Tech. A number of these areas also demonstrate the strong links between digital and the creative sector, especially in media, design and advertising.

Research suggests that **productivity** in the digital sector remains high while some areas of business and professional services face serious challenges in terms of low levels of productivity and it is likely that these will be areas where automation will be taken place more rapidly. While this will lead to a significant restructuring of employment including job losses in the short term, there is seen to be major scope for retraining and reskilling workers affected and directing them into particular growth areas within the digital sector. It is anticipated that for many reskilled staff the productivity gains could be dramatic, in some cases doubling the measure for average productivity from less than £40,000 GVA per worker to more than £80,000 GVA per worker.

The recent report from the **Manchester Digital trade association** on “How Manchester's Tech Sector is Tackling the Coronavirus Pandemic” identifies “reasons to be optimistic about recovery – there are definitely green shoots out there” and goes on to provide examples of “how businesses have adapted to the new normal, whether that is pivoting their business model, making permanent changes to the way they work or being in a niche that has flourished regardless of the virus”. Alongside this optimism the report goes on to outline how many of the changes brought about by the pandemic are likely to have a much longer term impact both on businesses and the wider labour market. Many companies are reported to be rethinking their need for office space and moving to a much higher level of flexible working than even before, even though many parts of the digital sector have embraced flexible working for a long time. This may result in digital businesses employing fewer permanent staff and increasing their use of temporary contracts and/or freelance staff. In recognition of this more work needs to be supported in further developing the entrepreneurial capability and resilience of residents and micro-businesses to thrive in an industry that is already moving towards reliance on contracting and freelance work.

The **Manchester Digital Strategy** recognises that Manchester is the largest and most dynamic digital sector outside of London and, as outlined above, the digital sector has very strong potential for recovery. There are, however, aspects of recovery for the sector that need support now, in particular for the large number of small businesses and freelancers impacted by the pandemic. Many parts of the sector are particularly resilient while others are finding that their specific skillset and their small size presents them with additional challenges as

supply chains are disrupted and some larger businesses are bringing particular digital skills in house. Manchester Digital is providing valuable intelligence about these threats and challenges as well as the opportunities for enhanced resilience during recovery. In addition specific support will be needed to help sustain some workspaces, including co-working spaces and studios, facing multiple challenges in trying to become more resilient and play an important role in contributing towards inclusive economic recovery.

Demand for **automation** and “**digital-first workflows**” is reported to be growing fast and will be driving change in all parts of the economy as well as providing work for Manchester’s digital sector. These issues are also a focus for research and innovation work within the university sector. New initiatives to coordinate and promote digital innovation range from the Digital Futures programme at the University of Manchester (highlighted below) to the new School of Digital Arts (SODA) at Manchester Met, as well as the joint universities’ initiative in developing the Cyber Foundry and the new AI Foundry. There is also the opportunity to address the Government’s (MHCLG) recent request for new projects which would address: “investment in innovation ecosystem including through improvements to research and development facilities driving up business productivity”.

One of the new initiatives in Manchester which is particularly relevant is around **Industry 5.0**, being developed by Digital Futures at the University of Manchester and part of the proposed new SMART Centre for Sustainable Manufacturing, Robotics and Intelligent Automation (see section 4.4 below) in partnership with Manchester Met. University and Salford University. This focuses on going beyond the concept of Industry 4.0 by integrating the human aspects of creativity and empathy in decision making with the growing role of smart, connected and autonomous digital and physical technologies, including robotics and AI. The Manchester Digital Strategy and the Smart Manchester Innovation Networking Enterprise (MINE) framework will be promoting discussion and planning around this concept to ensure that this work is more widely known and understood across the digital ecosystem. As specific projects develop idea is that the digital ecosystem will act as a catalyst to provide the networking support required to ensure that these are linked into economic recovery plans.

4.4 New models for digital innovation experimentation and delivery

Sector based research and innovation is demonstrating new models for developing digital applications and services building upon the now well established Living Lab models of open innovation. In particular work around **Smart Healthcare** and health innovation is also generating a wide range of new and innovative ideas for digital projects. The results of new research is supporting the co-creation of new production cycles for practical applications, particularly around health and social care, e.g. assisted living, can enable new thinking and new products to be tested in the market much more quickly and effectively, for instance using 3D printing, smart devices, better patient diagnostics and use of telehealth. The idea of the Manchester Smart Living Foundry applies new and innovative approaches from bio-engineering to smart healthcare, developing new production cycles from intelligent and predictive co-design, fabrication, evaluation and the co-production of new materials and services to new ways of bringing these to market. This work will be developed in collaboration with ongoing work with Health Innovation Manchester, Age Friendly Manchester and other initiatives.

Alongside these approaches it is also proposed to create a **cooperative digital testbed**, a “Cooperative Innovation Zone”, for organising future digital work using new mutual organisational models. The proposed GM Innovation Cooperative, which is one of the recommendations from the GM Cooperative Commission, will develop a protected space where digital businesses and workers can develop new ways of working. This will involve a shared contractual and commercial interface with the outside world in order to provide direct support for inclusive economic recovery. This would include new commercial, technical and legal platforms, shared digital tools, assets and resources and new standards and protocols based on cooperative values and principles – fair remuneration, shared risk, equal say, common reserves etc. This initiative is taking inspiration from SMART.coop (<https://smart.coop/>) a “collective entrepreneurship” initiative that operates in over 40 cities across Europe, with over 35,000 members, which is responding at scale to the challenges of the gig economy and freelance precariousness and is keen to cooperate with partners in Manchester.

As Manchester's economic recovery plans are implemented a key focus will be on working to create higher quality job opportunities, including with advanced digital skills, in all parts of the digital ecosystem as well as in all other sectors enabling them to become more digitally enabled and resilient. The Living Lab approach will help to further develop the innovation ecosystem in scaling up and deploying innovative smart digital infrastructure and capabilities across the city. Future foresight work will include focusing on more human centric and ethical approaches to automation and digital production, including AI and ideas of Industry 5.0, and linking this into the wider work in promoting new ideas and new practice, including through a proposed **Digital New Ideas Foundry** to act as a catalyst for new foresight work around longer term thinking and strategies about digital innovation and practice.

In particular the new initiative by the University of Manchester, Manchester Met University and Salford University to create the **SMART Centre for Sustainable Manufacturing, Robotics and Intelligent Automation** provides a good example of what is possible through innovative collaborations. This would build upon the three universities' digital capabilities and specific strengths in key areas including:

- Advanced materials and additive manufacturing;
- Virtualisation and Digital Twins;
- Artificial Intelligence;
- Intelligent Automation and Robotics.

The proposed **SMART Centre** would provide a focal point for industry and other partners to be able to engage with expertise *“addressing their sustainability and productivity challenges through a holistic approach, spanning:*

- *Digitalisation;*
- *Automation and optimisation of manufacturing processes;*
- *Utilising revolutionary materials and digital technologies;*
- *Instigating the required fundamental changes in business models;*
- *Upskilling the workforce;*
- *Addressing the organisational and wider societal impact of Industry 4.0.”*

All of this work will need support from a **Digital Investment Strategy** which will include looking at imaginative ways of accelerating the “levelling up” of investment particularly for digital and smart companies and other digital initiatives in Manchester. The majority of the investment work in the city and city-region is coordinated at a city-region level by GMCA and key agencies such as MIDAS. More work needs to be done to identify how investment can be increased both through enhanced joint work at city-region level and through local partnerships as has been done with Enterprise City and emerging collaborations in other parts of the city and the redevelopment of North Manchester General Hospital. Feedback from this first phase of consultation has also suggested that there should be targeted funding for ethnic and gender diverse businesses, not only to make such investment more accessible but also to promote tech and social innovation in new ways. There is also potential for attracting more targeted investment in green tech and through the deployment of innovative digital infrastructure, as outlined in section 5 below.

At the same time the continuing **convergence of the digital and creative sectors**, as outlined in section 3.3 above, highlights the potential for enhanced collaboration, empowering arts and culture generally but also thinking about ways that digital can support new and imaginative forms of creative practice and live performance. As ideas also develop around the idea of the “place ecosystem” and how smart places interact with smart prosperity in support of smart people we need to ensure that links and inter-dependencies with the innovation ecosystem are supported to be more sustainable and resilient.

Supporting **Future Prosperity** through **Digital Innovation** is a key part of Manchester's economic recovery plans with the city itself being enabled as a Living Lab for testing out new approaches to working and living, enhanced by digital technologies. Manchester has a real critical mass of research and innovation capacity, as the new SMART Centre proposals demonstrate, but the city faces many challenges in providing opportunities for the upscaling and practical implementation of the results of this work. The Digital Strategy aims to promote new and more open ways of developing collaborative innovation across Manchester and the city-region and to ensure that

digital innovation plays an important role in enhancing the resilience of the city through inclusive economic recovery.

In summary, by facilitating smart **Future Prosperity** through digital enabling the smart inclusive economy and recovery, the Manchester Digital Strategy will:

- a) Support the creation of more higher quality jobs and ways of working, ensuring advanced digital skills are available and accessible in all parts of the digital ecosystem;
- b) Expand and enhance the innovation ecosystem so that it can scale up and play its role in achieving the wider and more accessible deployment of smart digital innovation and capabilities across the city, including through new “cooperative innovation zones”;
- c) Promote future foresight to identify new areas of growth and resilience in the digital economy including more human centric and ethical approaches to automation and digital production, including AI and ideas of Industry 5.0, and seek to develop innovative investment strategies to support this;
- d) Recognise the convergence between the digital and creative sectors and ecosystems and link this into the city’s strengths in re-establishing economic momentum and enabling continued inclusive growth through digital innovation supporting culture recovery, including through enhanced digital access for venues and innovative forms of performance.

5. Smart Resilience: digital innovation supporting zero carbon goals and inclusive connectivity

5.1 Digital innovation for the low-carbon city

5.1.1 Using digital to drive a green, inclusive economy

Digital technologies are increasingly seen as having a specific role in supporting action on climate change and zero carbon aspirations. The recent report on [“Smart and green: joining up digital and environmental priorities”](#) (Green Alliance, October 2020) outlined five key areas of focus:

- Ensuring digitalisation and low carbon agenda are joined up in recovery plans;
- Investing in smart, net zero compatible infrastructure;
- Strengthening skills and capabilities with programmes supporting the growth of clean industries and digitalisation;
- Promoting the public benefit of data in supporting the transition to low carbon futures;
- Promoting greener digital technology.

Digital technologies and applications could be transformational for the environmental agenda and offer very practical solutions for current and future action. New, low carbon opportunities can be realised through enhanced digital connectivity and data analytics, especially in areas such as mobility, logistics, food and buildings. This is why the **Manchester Digital Strategy** is highlighting the many ways in which digital technologies can support Manchester’s commitment to becoming a zero carbon city, ranging from sourcing all of its energy from green sources to improving air quality and encouraging more walking and cycling. The starting point for this is to ensure that Manchester’s digital sector and ecosystem is working more closely with the **Manchester Climate Change Partnership** and to stimulate ideas about how the sector can develop digital solutions that can accelerate the move to zero carbon in Manchester and the city-region as well as the potential for collaboration with other cities, such as through the Eurocities network.

The idea of a **“Green New Deal”** is a key part of economic recovery plans and Manchester was one of the first cities in the UK to highlight this in its [“Manchester Climate Change Call to Action Report”](#) in 2009. In a digital world, where innovation is at the centre of new thinking about jobs, skills and the quality of life, ideas are emerging about ways of fusing together all of the diverse elements of a broader **Smart Innovation, Digital and Green New Deal**. Digital innovation is already supporting smart energy schemes both in terms of infrastructure, such as smart grids, and with digital services that enable users to improve the monitoring and control of their energy use, e.g. through smart meters.

The **Manchester Climate Change Framework 2020-25** sets out the “strategy towards making Manchester a thriving, zero carbon, climate resilient city” and four objectives to meet by 2025.

- Objective 1: Staying within our carbon budgets
- Objective 2: Climate adaptation and resilience
- Objective 3: Health and wellbeing
- Objective 4: Inclusive, zero-carbon and climate resilient economy

In order to meet these the strategy identifies six priority areas for action:

1. Building (existing and new)
2. Renewable energy
3. Transport and flying
4. Food
5. The things we buy and throw away
6. Green infrastructure and nature-based solutions

The **Manchester Digital Strategy** aims to align with these objectives and action areas and to identify ways in which digital innovation can best be used to support these. The Digital Strategy’s primary themes around smart

people, smart places and smart prosperity provide opportunities to address the ways that digital inclusion, digital neighbourhoods and digital innovation can support Manchester’s goal of becoming a “thriving, zero carbon, climate resilient city”, including:

- **Smart data:** using Manchester’s new Data Management Strategy to ensure that data collection, data analysis and data visualisation is enhanced through the deployment of smart sensors and other data gathering devices, backed up by advanced digital infrastructure, with the proposed Smart Urban Data Discovery Platform (see section 3.2 above) being utilised to analyse and disseminate results in ways which can be easily understood making it easier to take action based on the evidence;
- **Smart climate resilience:** ensuring that digital infrastructure and services are embedded into all buildings, both new and through retrofit, into other infrastructure (including all utilities) and into the natural environment, especially creating smart connectivity in civic places and public spaces;
- **Smart health and wellbeing:** using digital connectivity and services to enhance online access to health information and advice, creating new virtual ways of participating in cultural, sporting and leisure activities and wider deployment of telehealth and telecare services to provide digitally enhanced assisted living capabilities and facilities;
- **Smart people and digital decarbonising:** carbon literacy will be a key part of inclusive approaches to engaging residents and businesses in the process of climate adaptation and resilience and this should be linked with the digital inclusion and digital skills development work outlined in section 2 of the Digital Strategy.

5.1.2 A digital action plan for carbon reduction and climate adaptation

There is great potential for creating digitally enabled **smart buildings**, linking together smart places with the digital innovation ecosystem through programmes of investment for retrofitting both buildings and public realm with smart digital infrastructure and capacity. This would enable better monitoring and management of usage, energy requirements and resilience and support data analytics enabling real-time decision making to reduce energy consumption and enhance environmental benefits. All new build should be required to meet standards for the kind of future proofed digital infrastructure outlined in section 5.2 below, including full capacity for fibre ready ducting, wireless equipment and smart energy capabilities. **Smart lighting** is another area in which digital systems supporting LED lighting roll out can not only reduce energy use but also help to create more adaptable and secure environments. Even where existing systems are not yet “smart” the commitment to retrofit can increasingly utilise digital innovation to add in smart elements on the basis of cost effectiveness and service efficiencies, for example as outlined in the City Council’s new Street Furniture Guidance document.

Digital innovation has also played an important role in **smart mobility** initiatives and TfGM have a number of pilot projects, including around the use of 5G, from which lessons can be learnt, for example developing collaborative digital infrastructure from the reuse and sharing of assets such as those in road, tram and rail systems. One of the proposed themes of the Civic Innovation Programme (see section 3.2) will be on **Urban Mobility NOW** “helping with active travel solutions for the future, to reduce congestion, improve travel choices, and encourage the transition to low carbon transport options”. There is also an aspiration for this to make up a wider analytical ecosystem which could digitally monitor and help to evaluate the city’s overall environmental performance.

Smart nutrition is another area relating to health and wellbeing where digital applications and services can play a significant role, from informing people about food choices to enabling community organising around food supplies, including food coops, foodbanks and local sourcing. New models for urban food production, e.g. hydroponics and aquaponics, require sensitive monitoring and management and so accessible digital systems are essential to underpin this.

Consumption based emissions relating to the things that we buy and throw away are estimated to be as much as 60% higher than a city’s direct carbon emissions. A **smart circular economy** is required where local sourcing is the norm and product information can be made more accessible and easier to analyse with repair and recycling facilities more widely known and understood. There is potential for repair and recycling to be linked more closely

with FabLabs and other digital production facilities to give products longer lifecycles and to enable upgrading and “upcycling” with digital enhancements. Digital capabilities to support **green infrastructure and nature-based solutions** can provide for enhanced monitoring and management of these assets, opening up opportunities for data driven promotional and educational activities, citizen science projects and improved facilities such as advanced Wi-Fi in all public spaces. Feedback from Manchester Met University has suggested ways of using the “Foundry” model to foster more green and digital research and innovation. Manchester already has a vibrant ‘**green tech**’ sector, highlighted by the work of [Pro-Manchester’s Green Economy network](#) and Green Tech events, and, together with the universities’ commitment to green innovation and research, this can provide a strong basis for future work on green/digital convergence and collaboration. This can be complemented with further support for business transformation towards zero carbon building on the experience of programme such as [GM Business Growth Hub’s Low Carbon Network](#)

5.1.3 Using digital to support smart energy systems

In terms of **smart energy** there should be more proactive plans for further development of smart grids and greater capacity for local renewable generation, including looking at the feasibility of greatly enhanced storage capacity and research and innovation programmes on the development of battery technology. There is also the potential for generating renewable outside of the city working in partnership with green energy investment companies and cooperative models.

Local development of digital infrastructure and capacity would be aligned with the strategic priorities if the Manchester Climate Change Partnership, as outlined above, and also at city-region level including the GMCA Local Energy Market (LEM) initiative. In addition this would increasingly be a practical alignment as the actual deployment of new energy infrastructures could be part of a “dig once” approach to digital infrastructure which, in turn, can be used to make the energy services smarter. New collaborations around developing local energy masterplans with enhanced digital capacities will be encouraged and the potential for digitalisation supporting green investment ready business models needs to be highlighted. As outlined in section 5.2 below there is also potential for aggregating assets so that digital infrastructure can be rolled out in ways that benefit not only energy networks, including the Manchester Civic Quarter Heat Network, but also digital connectivity for energy infrastructure across the city.

Just as the new Manchester Digital Strategy is focused on the idea of **Smart Manchester for Inclusive Recovery** the City Council has made a clear commitment to having the Manchester Climate Change at the heart of its recovery plans and the reset of the Our Manchester strategy. Relating back to the idea of fusing together Smart Innovation and Digital into a comprehensive Smart Innovation + Digital + Green New Deal there is a clear role that digital innovation and the digital ecosystem could play in enabling action on carbon reduction and climate adaptation while at the same time supporting jobs, skills and quality of life.

In summary by promoting **digital innovation for the low-carbon city** the Manchester Digital Strategy will complement and support the Manchester 2020-25 Climate Change Framework and Action Plan by:

- a) Helping to ensure that smart energy and smart mobility initiatives are properly supported through digital innovation capabilities and facilities in the city;
- b) Enabling a green audit process to be developed for all digital initiatives and to complement this by creating digital audits for green and low-carbon initiatives;
- c) Use digital design to improve the public realm, creating new smart civic spaces, with a clear framework for incorporating digital capacity into street furniture and public spaces to help improve liveability;
- d) Use smart data to support the commitment to have data driven policy and decision making within frameworks and action plans and to support projects with digital capacity in areas such as safety, security and waste management.

5.2. Smart connectivity: developing innovative and resilient digital infrastructure

5.2.1 Digital infrastructure as a utility not just a commodity

Manchester's commitment to being "**a connected city**" is one of the main outcomes of the **Our Manchester Strategy**, as well as here in the new **Manchester Digital Strategy**. Both Manchester and the wider city-region needs not only to capitalise on the world class infrastructure and connectivity that has been created to date but also to look to the future and find ways of staying ahead of the curve for future digital infrastructure. This means new models of delivery and finding ways that digital infrastructure can be delivered as an essential utility not just as a commodity. The City Council has been highlighting the importance of investment in digital infrastructure for "developing a more resilient city" in all parts of its current work on inclusive economic recovery and this is also a key element of the Our Manchester "Inclusive Economy" Local Industrial Strategy.

This strategic priority, together with future investment to implement specific digital infrastructure projects, will be closely aligned with the City Council's **digital transformation** and ICT Strategy. This will ensure that the City Council's own digital infrastructure and assets can be enhanced as much as possible, including supporting the extensive upgrading and deployment of MCC WAN/LAN networks and capabilities. The main priority will be on delivering work in progress and ensuring that this meets the City Council's commitments to achieving social value, both in procurement and in delivery. The objective is to achieve the most extensive and comprehensive deployment of the best **digital connectivity** in every neighbourhood of the city with the most accessible and affordable capacity available to all residents and businesses. This will involve the City Council's own assets, those of key partners, including in transport (e.g. TfGM), health, education and housing, extending the scale and scope of the Digital Coop (CNI) and through innovative partnerships with the large operators and other infrastructure providers. This will provide a foundation for further engagement work with employers across the city (in the public, private and VCSE sectors) to encourage wider connectivity for their workforces which could also be made available to service users and residents.

In setting out the city's digital ambitions and capacities in the context of inclusive recovery the Manchester Digital Strategy is focusing on being able to use digital infrastructure and innovation to create a smarter, more resilient and future-proofed city. One of the most important delivery mechanisms for this is the development of **Cooperative Network Infrastructure (CNI)**, also known as the "**Digital Coop**". CNI involves Manchester City Council, working in partnership with other public and community organisations (including the NHS, universities, colleges, cultural agencies, housing RSLs and the voluntary sector) and business networks, including the Manchester Digital trade association. It is the next stage of the partnership between MCC and Tameside MBC to extend the original CNI/Digital Coop duct and fibre infrastructure to more than 100 public, research and innovation locations across Manchester, starting with the Corridor Partnership area, including reusing the original Corridor digital infrastructure built in 2010 by Geo (now Zayo).

This will provide faster and more resilient fibre connectivity to the digital sector and support community initiatives to enhance digital inclusion thus ensuring that access to the fastest possible broadband is made more accessible and affordable. This will help in both safeguarding existing jobs and skills and providing part of the improved and more resilient digital infrastructure required to create new jobs and skills for a post-pandemic more inclusive economy. This is bringing neutral open access state of the art digital infrastructure across Manchester and Tameside, and then potentially to other parts of GM, including using spare fibre duct running alongside Metrolink routes and with the opportunity to do the same with the Corridor and Heat Networks. This is going beyond "full fibre" and is the basis to future-proof current investment including all new wireless technologies.

This complements national funding from DCMS for Public Sector Building Upgrade (PSBU) work already underway and addresses all of the appropriate State Aid issues previously agreed through Tameside MBC in launching Cooperative Network Infrastructure (CNI) (the GM Digital Coop) on the Market Economy Operator Principle (MEOP). This further and much wider deployment will extend to key sites supporting the city's Innovation District

(across the Corridor Partnership area including the University of Manchester, MMU, Health Innovation Zone and Manchester Science Partnerships) and innovation ecosystem including the NOMA regeneration partnership (additional incubators and accelerators), Sharp Innovation Centre, Wythenshawe Health Campus and District Centre and key public sector projects within Airport City and Enterprise Zone. Future work will deliver:

- Developing a new mutual open access 'Digital Exchange - DX' together with a number of neighbourhood based smaller DX points-of-presence (DXPs) as carrier-neutral aggregation points;
- building new neutral fibre spine from the principal Internet Exchange (IX) point in MSP (at the heart of the Innovation District) to the new Corridor heating and energy network, to the Health Innovation Zone and down to Wythenshawe Hospital, District Centre and Airport City and the Enterprise Zone;
- Metrolink tramside connectivity via diverse routes;
- providing a neutral host testbed for advanced wireless deployment, including LoRaNet and 5G;
- a new 'FibreManchester' brand and registration system to raise awareness and plot demand clusters for investment as well as supporting new crowdsourcing approaches for 'build your own' deployment, providing a simple investment vehicle both for businesses and the community.

This new capacity also needs to be supported through improved processes for planning, project management and achieving social value through as open and flexible an approach as possible for all telecoms operators and other infrastructure providers and investors, as well as digital social value being linked more widely to other procurement and planning processes. The **Manchester Digital Strategy** will inform a more detailed explanation of its non-exclusive, open access approach to be set out in the **Manchester Smart City Action Plan** and a new **Manchester Digital Infrastructure Toolkit** which will be part of this. This will underpin the continuing collaboration with all major infrastructure providers, some of which, i.e. Virgin, have already joined CNI, to ensure that the fastest and most accessible universal service provision is available to all residents and businesses in all areas.

Manchester has a commitment to "dig once" wherever possible, minimising disruption and developing new digital mapping of where networks and assets are and how they can be accessed. Together with commitments for fast-track planning and engineering support and the tackling of legal barriers, such as simplification and standardisation of wayleaves, this aims to promote the faster and more efficient upgrading and deployment of future digital infrastructure. It also aims to maximise the re-use of existing digital infrastructure assets for both fibre and advanced wireless networks.

5.2.2 Smart infrastructure supporting digital neighbourhoods and enhanced access to connectivity for all

Manchester's digital economy needs resilient digital infrastructure more urgently than ever before in order to support rapid and resilient recovery post-Covid-19 and it does not yet have this. There are two main reasons why this is a priority, firstly providing a triple stimulus for inclusive recovery, including:

- a) immediate stimulus for construction, fibre deployment, networking as Manchester's "distributed innovation ecosystem" is enhanced with consequent support for jobs and training opportunities;
- b) continuing stimulus to Manchester's significant digital infrastructure and hosting sector, which will be operating, maintaining and commercialising the networks and systems;
- c) continuing benefits for productivity through faster future-proof full fibre Internet infrastructure and applications using this, including 5G.

The second reason is about resilience as during the pandemic there have been failures of digital infrastructure and Manchester's innovation ecosystem needs more resilient future-proofed Internet in two particular areas:

- a) Topological resilience – new spine fibre connections connecting key nodes by diverse routes;
- b) Commercial resilience – which must be made available on neutral non-exclusive basis so that multiple ISPs and operators can use it. This increases diversity of supply, competition and the scope for innovation, hence the use of the cooperative neutral host model.

Commercial resilience means that there is enhanced future-proofing because of the diversity of supply which is less prone to stress or failure. This in turn provides new opportunities for local and smaller digital/tech businesses to add value with access to infrastructure (rather than services) that otherwise would not be available to them. In addition the public sector has more choice in its procurements and greater access to innovation and new services and applications.

Creating digital resilience is created by building the “scaffolding” from which Internet Service Providers – ISPs, operators and other SMEs providing specialist services can then build out to reach more customers more easily and effectively – both public sector and others in the innovation ecosystem. That in turn means: more scope and scale for fibre spines and shared neutral digital exchanges which thus encourages more investment. Operators can choose their areas, for example, they don’t need to ‘roll out’ across the conurbation to achieve scale but can instead share and co-produce connectivity which also means smaller and local ISPs and operators, including new start-ups, can take part, increasing productivity and growing new markets.

The commitment is to use this ‘build out’ to support the digital neighbourhoods outlined in section 3. This new smart digital connectivity will be provided by extending digital infrastructure on a neutral open access basis to all neighbourhoods across the city, working in partnership with CNI/GM Digital Coop, it’s members and other suppliers, to identify buildings, public spaces and other existing digital facilities which can be made more accessible to support the roll out of the smart places programme. This will also support digital inclusion initiatives and ensure that as many residents, community organisations and local businesses can maximise their ability to use digital services in the most accessible and affordable basis possible.

Another whole layer of digital connectivity will be needed if easy and affordable access is to be delivered to all local residents in every digital neighbourhood. One other new initiative under discussion is a **Smart Urban Place Access Community Network – SUPA-Net** which would be able to develop a new layer of neutral, open access advanced digital wireless connectivity. This would build upon the City Council’s own access network as well as on the full fibre infrastructure of the GM Digital Coop (Coop Network Infrastructure – CNI), plus offer an innovative scheme for access devices through a new equipment loan scheme for the most socially excluded across the city. This would also aim to tackle digital exclusion and enable all residents to participate in the digital economy as part of Manchester recovery plans to deliver an inclusive economy for all. This will be complemented by further collaborative work with the major tech and telecom companies, e.g. Vodafone, Virgin, BT, Open Reach, Amazon etc., to ensure that industry wide collaboration can help us to achieve our objectives.

5.2.3 Supporting research and innovation in next generation smart connectivity

Manchester’s digital research and innovation capacity is one of the best in Europe and can be further strengthened by setting out ambitious goals for future development. Ideas under consideration include:

- Developing a new **Lightwave Infrastructure Research Testbed Living Lab** which would be building upon Manchester’s research strengths in optical technologies and quantum computing with the aim of achieving similar, or even better, results than the Australian Testbed in Melbourne which recently reached the world’s fastest internet speeds of 44.2 Tbps (that is 44,200 Gbps which is rather faster than “Gigabit broadband” speed targets in the UK of 1 Gbps, in fact 44,200 times faster), this would also build on existing collaboration between Manchester and Melbourne both at research and civic levels;
- This would be complemented by the implementation of new open access dark fibre using CNI’s Digital Coop network, the working title for which is the **Manchester Fibre Research & Innovation Network Group (MF-RING)**. This would create new high capacity open access infrastructure to support research and innovation with the scope for both immediate and longer term commercialisation. The benefits will be focused on SME growth and innovation and the further enhancement of the innovation ecosystem to maximise the impact on productivity, jobs, skills and post-Covid recovery;

- Supporting new research and innovation around **Next Generation Wireless** looking both at high tech and low tech solutions, so from 6G (which is expected to be commercially deployed in the 2030s, at speeds of up to 100Gbps) to Long Range (LoRa) networks based on Low Power Wide Area Networks (LPWANs) which have a capability of providing low carbon and low cost solutions, including for Internet of Things (IoT) deployment.

In summary the deployment of **smart connectivity** to provide innovative and resilient digital infrastructure, as outlined in the Manchester Digital Strategy will:

- a) Work to ensure that digital connectivity is developed as a utility not just a commodity, through new models of co-production and co-ownership of digital assets;
- b) Enhance the City Council's own public wireless connectivity with additional forms of community based Wi-Fi provision supporting digital neighbourhoods and smart places;
- c) Place social value at the heart of our commitment to support the widest possible deployment of innovative digital connectivity including through sourcing and procurement;
- d) Build further capacity for research and innovation to support the deployment and resilience of digital infrastructure and smart connectivity;
- e) Develop Manchester as a test bed for wireless enabled Internet of Things (IoT) initiatives using all forms of innovative wireless technologies including LoRaNet and 5G;

6. Implementation and delivery: Manchester Smart City Action Plan

The new **Manchester Digital Strategy** will be realised through the production of the **Manchester Smart City Action Plan** based on collaboration and co-production at two main levels:

- a) with the existing the digital ecosystem, as outlined above;
- b) through new collaborations that are emerging as people, organisations and networks are thinking and working in new ways to co-create imaginative solutions to the challenges of the pandemic and to ensuring an inclusive economic recovery.

This means that some of the strategic priorities outlined above are based on updating and enhancing longstanding commitments and work programmes while others are new and are aiming to go significantly beyond the current state-of-the-art through more innovative and future focused ideas and practice. This is both a response to the pandemic focusing on recovery and also a wider commitment to be much more sustainable and resilient in the future, using foresight and scenario planning to think and act differently.

This needs new thinking and more innovative practice so that the results of research and innovation can be scaled up and deployed wherever they are needed across the city. The City Council and all of its stakeholders and partners need to be thinking and discussing how best to deliver more inclusive outcomes and results from the new Digital Strategy. As part of the ongoing discussions about delivery and implementation we will be developing the Manchester Smart City Action Plan further. This first outline draft, in Annex 1, lists some of the key headings, based on the four main themes outline above, plus some of the indicative project ideas that are currently being worked on, together with planned outcomes. The plan is that this will be reviewed annually through the proposed five years of its implementation from 2021 to 2026.

It is essential that the City Council's partners and stakeholders are able to buy in to a shared vision and strategy in order to have a collaborative commitment to take forward projects and initiatives. In the first instance Manchester City Council will convene a Board to drive the Digital Strategy forward.

Creating a digitally enabled inclusive economy and society will need commitment and support from all partners across the city working collaboratively and investing their time, energy and, wherever possible, resources in order to achieve this. The **Manchester Smart City Action Plan** aims to provide a new **Digital Vision** for Manchester backed up with clear descriptions of the required **Leadership** and **Governance** that will be needed to enable us to deliver this. In order to achieve this **Manchester Smart City** partnership boards and working groups will be proposed in order to oversee the development of programmes of work and support effective governance of their

implementation. As well as developing a shared commitment to ensuring that social value is at the heart of all aspects of the **Manchester Digital Strategy** it is also important to include increasing economic, social and economic justice across the city, especially with digital inclusion being the single most important aspect of this work.

The focus of the **Manchester Smart City Action Plan** is to utilise existing assets and skills and to enable proposals to be brought forward for new work programmes and projects which can be developed in the most agile and resilient ways possible. It is hoped that, by working with partners using existing assets to form the **Smart innovation Hub** and the **Smart Manchester Innovation Networking Enterprise – Smart MINE** – framework, we can create not only an enhanced innovation ecosystem across the city but also a more sustainable basis for future co-design and co-creation for upscaling and practical implementation of digital innovation at all levels.

Manchester City Council will continue to work closely with everyone who has collaborated to produce the ideas and proposals brought together so far. This will include outlining options for coordinating and implementing new work programmes and practical projects, as well as more resilient funding models for supporting this work in the context of inclusive economic recovery.

Annex 1: Manchester Smart City Action Plan: draft framework (the core commitments)

NB. This is very much work in progress and these are indicative outlines subject to discussion and revision

A. Smart People: Digital Inclusion and skills

1. Digital skills and inclusion at the heart of the Digital Strategy: Working with employers, skills providers and business networks to enhance the digital talent pipeline to address current and future needs, based on the need to support digital growth sectors and wider digitalisation across the whole of the local economy including to increase productivity, balance the future impact of automation and promote ethical tech.

2. Promoting digital inclusion, diversity and equality: Identifying new pathways into employment and skills for all residents and businesses and more open and equitable opportunities to access these, based on overcoming barriers to digital access and skills with innovative and proactive practices to engage with everyone facing disadvantage and discrimination.

3. Ensuring skills progression from entry level to high value opportunities: Identifying the new skillsets that are required to support inclusive recovery and future growth including retraining and enterprise skill needs. As recovery impacts on a further restructuring of the economy special measures will be required to support both entry level and higher value level requirements.

4. Using digital and creative sector convergence to support new opportunities for jobs and skills: Enhanced collaboration between the digital and creative sectors and joint work to promote the opportunities and needs of digital/creative convergence. Digital skills for creative and creative skills for digital are increasingly interdependent and mutual benefits for both sectors can be achieved through closer collaboration

B. Digital Places: creating smart places and digital neighbourhoods

5. Creating a Manchester Digital Office: Creating a focal point for coordination of activities and projects supporting the implementation of the Digital Strategy. As digital policies and initiatives become embedded in all areas of policy and practice a single point of contact is needed to enable improved collaboration and coordination.

6. Digital Action Plans for every neighbourhood: Developing a Smart Places deployment programme to create digital neighbourhoods in every part of the city, and complementing existing work, such as the Ambition for Aging initiative. There is a recognition that many areas of the city lack basic access to digital services and infrastructure and a more proactive response is needed to change this.

7. Commitment to digitally enabled place-making including public realm: Coordinating digital enhancements in all regeneration and development projects. All regeneration and development projects need to be future proofed so that enhanced digital services and infrastructure can be seamlessly added at any time.

8. Promoting smart urban design and intelligent buildings: The development of smart planning and development tools, such as “Digital Twin” and a “Digital Infrastructure Toolkit” will help to streamline the planning and deployment of a smart built environment. Manchester needs to have the most advanced digital planning and infrastructure models and tools available to be a smart city and to use these in wider promotional and educational work.

C. Future Prosperity: enabling a smart inclusive economy

9. Enabling the digital sector to support high quality job creation and business development: Enhanced communication and collaboration with the digital ecosystem to gain improved evidence and data to inform support for digital business development. Intelligence based on improved evidence and data about the performance of the digital sector and the wider digital ecosystem is essential to inform decision making and to support digital initiatives across the city.

10. Enhancing the innovation ecosystem to attract more investment and support digital growth: Establish a Digital Innovation Network, on a similar model to the Digital Skills Network, to meet regularly and highlight new developments. Manchester needs to increase the capacity and visibility of its digital innovation assets and capabilities and to ensure that innovation ecosystem continues to grow and provide intelligence about digital growth and opportunities.

11. Future foresight work on digital to identify and promote new areas of growth, e.g. Industry 5.0: Strengthen the capacity of the Urban Observatory to support the proposed Smart Urban Data Discovery Platform to enhance data and intelligence on digitalisation and future trends. As recovery continues it is likely that growth in some parts of the digital sector will accelerate while other parts will decline. It is essential to have new capacity to monitor and understand this.

12. Supporting the Culture Recovery Plan through digital innovation in arts, culture and creative: Supporting closer collaboration and project initiatives between the digital and creative sectors and ecosystems, including through exemplar projects such as the Factory development. Many parts of the arts, culture and creative sector are now accelerating their use of digital services and tools to support recovery and new ways of working and this will need longer term support and capacity building.

D. Sustainable Resilience: digital innovation for zero carbon and inclusive connectivity:

13. Enhanced digital capacity and facilities to support smart energy and smart mobility: Undertaking an audit and asset mapping exercise of digital infrastructure and collaboration with other networks to identify links with energy infrastructure. Smart energy and mobility infrastructure needs to use smart connectivity and there is great potential of creating a ‘win-win’ through asset sharing.

14. Developing greater mutual support between green and digital initiatives: Developing a Manchester Green and Digital Audit to highlight both existing initiatives and the potential for new developments, with regular intelligence updates. The use of digital to support green initiatives and the need for digital services, especially digital infrastructure, to be part of the solution for zero carbon.

15. Promoting ethical resilience: Focusing on responsible stewardship for the future with innovative and ethical data driven policies to improve urban environments, supporting health, wellbeing and liveability.

16. Digital infrastructure to be deployed as a utility on an open, neutral host basis: Extending both the scope and the scale of Cooperative Network Infrastructure (CNI), the GM Digital Coop, to underpin the roll out of smart places and digital neighbourhoods. Manchester has always led the way in pioneering new approaches for digital infrastructure and services and can use these new assets to continue to do so.

17. Building new capacity for digital research and innovation supporting inclusive connectivity: Bringing together the innovation and digital ecosystems to collaborate on realising the potential for this. The critical mass of digital businesses and the wider digital ecosystem means that the city is well placed to be a national and global leader in digital research and innovation.

18. Social value at the heart of digital connectivity including in sourcing and procurement: Making sure that the opportunities of social value are used fully in all aspects of digital investment and infrastructure deployment. The idea of digital connectivity being a utility and not just a commodity can be realised by a social value approach to expanding digital infrastructure and enhancing the digital ecosystem and linked to related planning and regeneration developments.

Annex 2. List of case studies and supporting documents

[NB. As in the Our Manchester Industry Strategy, a series of case studies would be placed throughout the narrative, based on the list below and starting with the Manchester Digital Skills Network.]

CASE STUDY 1. Manchester Digital Skills Network

CASE STUDY 2. DIGIMAKERS initiative: Young Manchester/HIVE & partners

CASE STUDY 3. Manchester Libraries and Digital Inclusion

CASE STUDY 4. Responsible Tech Collective and Fed House

CASE STUDY 5. Manchester Digital & Big Chip

CASE STUDY 6. Future Everything

CASE STUDY 7. Manchester Technology & Innovation Centres

CASE STUDY 8. Cybersecurity Centre of Excellence

CASE STUDY 9. Factory/HOME Digital Creativity Programmes

CASE STUDY 10. Cooperative Network Infrastructure/CNI – GM Digital Coop

CASE STUDY 11. MMU School of Digital Arts (SODA)

CASE STUDY 12. Manchester Urban Observatory & Health Innovation Manchester (led by University of Manchester)

CASE STUDY 13. Manchester College EdTech Demonstrator

CASE STUDY 14. Institute for Cultural Practices and Creative Manchester, University of Manchester

Annex 3: Smart City Charter: the “Eindhoven Principles”

Annex 4: Case studies of City Digital Strategies and Smart Cities initiatives: adding 4-5 examples from the ARUP report and Eurocities

Annex 5: Manchester Digital Infrastructure Toolkit proposal

Annex 6: Acknowledgements: list of organisations and networks involved in consultation to date

Dave Carter, Digital Strategist, Manchester City Council. January 2021