

# **Stakeholder engagement in Smart City initiatives: insights from a review of Smart City initiatives in four UK cities**

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## 1. Executive Summary

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More and more people are living in cities now than at any time in human history. By 2050, it is estimated that more than 70 per cent of the world's population will be living in cities. In the UK, nearly 80% of the population will be living in cities by 2030. This urban agglomeration of people and businesses presents both an opportunity and a challenge to city authorities. New ideas, a constant supply of workers, and potential growth in local revenue mobilisation are just some the benefits that accompany this urbanised future. Simultaneously, the concentration of people and businesses within cities also means an increased demand for city services, e.g. healthcare, education and security, as well as increased pressure on road and rail networks, housing, leisure facilities and other city infrastructure. Growing demand against a backdrop of cuts in public spending is a challenge for city authorities and is pushing them to explore innovative and more efficient ways of organising life in cities and ultimately improving citizens' welfare.

In tandem with these challenges, advancement in information communication technologies and a growing amount of public data have inspired city authorities, technology and telecommunication companies, universities and civil societies to look for a more concerted approach that takes advantage of these digital innovations to address city challenges. Smart Cities have been proposed as one of the main avenues through which the present and future urban challenges facing cities can be tackled. Smart Cities essentially combine massive amounts of data and innovations in digital technologies to offer solutions to current and future urban problems in the form of partnerships with different stakeholders. There is now a strong consensus that the lifeblood, and indeed the success, of any Smart City project depends on the extent to which it engages different stakeholders within the city throughout its life-cycle. More specifically, there has been call for stakeholder engagement to be initiated right from the idea initiation stage and not at the end user stage.

The UK now has a considerable number of Smart Cities. However, the extent to which stakeholder engagement underpins the Smart City projects taking place in most UK cities is unclear, nor is there clarity over the forms of engagement being implemented. Against this backdrop, this report reviews case studies of Smart City initiatives in UK cities to understand the extent to which they engage stakeholders and the forms of stakeholder engagement they deploy. The overarching aim of this report is to gather insights that can first help deepen understanding about the nature of stakeholder engagement in UK Smart Cities. Secondly, and more crucially, the study aims to use the insights from the case studies to conduct empirical research whose outcome would subsequently be used to inform the development of a best practice guide for stakeholder engagement in Smart City projects in the UK and beyond.

Drawing on the cases of London, Manchester, Milton Keynes and Glasgow, the report uncovers the following general observations about Smart Cities in the case study cities and also the specific observations regarding stakeholder engagement.

General observations regarding Smart Cities in the case study cities include:

1. Strong emphasis on the power of data and the benefits of data sharing, but limited insights on sensitive matters about data

In most of the documents setting out the Smart City visions, plans and initiatives of the case study cities, there is much emphasis on how access to data can unlock opportunities for cities. However, there is very little, and nothing concrete, in these information sources regarding oversight of and accountability for sensitive matters and issues relating to data ethics, data privacy, data governance, intellectual property, third party rights and monetisation of data.

2. Some alignment between city challenges and Smart City initiatives, but limited focus on structural and endemic problems

There is evidence to show that some Smart City initiatives are aligned with city challenges. For example, growing environmental concerns regarding inner city congestion and rising carbon footprints have meant that cities are now penalising vehicles that run on fossil fuel and promoting the use of electric and autonomous vehicles, which are considered more environmentally friendly. There is however little evidence to show that Smart City initiatives are oriented towards helping to address those structural and more complex problems (e.g. inequality, poverty and homelessness) currently facing most UK cities.

3. Disproportionate focus on transportation, congestion and environmental impacts

Although, as a concept, a Smart City will focus on different verticals or components like smart governance, smart economy, smart mobility, smart environment, smart people and smart living, the findings from the case studies seem to suggest that disproportionate attention is paid to initiatives that are oriented towards smart mobility and smart environment rather than to other components of the Smart City concept.

Specific observations regarding stakeholder engagement in the case study cities include:

1. Absence of a comprehensive stakeholder engagement plan

The report finds that, although the Smart City visions, strategies and plans of the case study cities make reference to engaging local residents and other stakeholders, none has published its stakeholder engagement plan. This elicits the question as to whether they have a stakeholder engagement plan in place to guide how they conduct stakeholder engagement or not.

2. Growing evidence of citizen-led initiatives

Contrary to criticisms that most Smart City initiatives are very top-down and do not allow citizens to make any substantial contribution at the design stages of Smart City initiatives, the report found some evidence of initiatives under Smart Cities that allow residents who are non-technical experts to propose, lead and execute projects that have the potential to address urban problems. Good examples are the Indie Food Forum and Food Passport in Milton Keynes and the community gardening project in Glasgow. However, there is no concrete evidence to show how ordinary residents are involved in the more technical and sophisticated initiatives other than in participative hackathons, the outcomes of which are sometimes predetermined by the project initiators.

3. Lack of evidence supporting post-implementation success of Smart City initiatives

The report found that, while some of the Smart Cities provide relevant statistics regarding the number of people who were engaged in Smart City projects, there is a lack of empirically supported evidence of different stakeholders' appraisal of the usefulness of the forms of stakeholder engagement they were able to participate in, or of the specific Smart City initiatives themselves.

Following on from these findings, the report makes the following specific recommendations regarding stakeholder engagement. Further, more comprehensive recommendations will follow after the empirical work.

Recommendations:

1. Preparation of a stakeholder engagement plan

To prevent stakeholder engagement from becoming an after-thought or a mere leitmotif in Smart City discourse, it is recommended that city authorities and their project partners, in consultation with different stakeholder groups, put together a stakeholder engagement plan. This should provide clarity as to what stakeholder engagement will be; who qualifies to be a stakeholder; why and how stakeholders should be engaged in ways that not only get them to approve of a project but empower them to make a substantial contribution towards how the future is imagined; and what resources and tools are deployed to realise the future envisaged collectively. The plan should also detail key performance indicators that can help to track not just the number of people taking part in the stakeholder engagement but its overall usefulness for the participants.

2. Demonstrate transparency and responsibility regarding stewardship over public data

To tackle the growing concerns regarding data ethics, usage, governance, storage, retrieval and destruction, the report recommends that city authorities implementing Smart City initiatives draw inspiration from London's establishment of the office of Chief Data Officer and an Advisory Board that can exercise oversight and set standards and guidelines regarding the collection, use, storage, retrieval and destruction of public data, etc. This should have regard to provisions within both the General Data Protection Regulations (GDPR) and the Data Protection Act (DPA 2018).

3. Develop an understanding of both organisational and citizen-side constraints likely to undermine co-productive forms of stakeholder engagement

While there is now strong support for engaging stakeholders at the very initial stages of a Smart City initiative, it should be clear whether stakeholder engagement is becoming a societal value merely to be aspired towards or if there is some empirical evidence justifying its functional utility. In view of this, we recommend that city authorities and initiators of Smart City projects conduct empirical studies to examine the institutional and citizen-side factors that can either enable or bolster the adoption of more co-designed and co-productive forms of stakeholder engagement.

## 2. Background

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It is estimated that nearly 70 per cent of the world's population will be living in cities by 2050 (Cathelat, 2019). In the UK, over 80 per cent of the population will be living in urban areas by 2030 (DJS Research, 2016). Against a backdrop of severe cuts in public sector funding, increasing urbanisation is putting a strain on urban physical and social infrastructure and services. For example, rising levels of urban crime, inefficient timetable management in the rail industry, long waiting hours in GP surgeries, inadequate affordable housing are but a few of the problems brought about by urban agglomeration, changing social demography and inadequate public sector finance. Concurrently, the growing concentration of people in cities, coupled with advances in digital technologies, is generating unprecedented amounts of data, which governments, businesses, universities, civil societies and local communities believe can help us better understand the built environment and find solutions to urban problems.

In this maze of growing digitisation, Smart Cities have been singled out as one of the avenues through which urban cities can lever big data and innovations in digital technologies to address some of the existing and future urban problems. Throughout the world, we are witnessing a growing number of Smart Cities, or more appropriately Smart City initiatives, such that UNESCO recently commissioned a study entitled *Smart Cities: Shaping the society of 2030*. This comprehensive report, running to over 300 pages, provides a picture of how digital innovations could transform the houses we live in, our modes of transport, how children are taught in school, how city authorities identify and sanction criminals, and how money is transferred, all of which are summarised in the prologue of the report. The report strongly suggests that despite differences in traditions, culture and religion in most mega-cities of the world, the globalised lifestyle of Smart City dwellers seems more imminent than ever.

The purpose of this report is to review and present evidence of stakeholder engagement in Smart City projects across the UK following concerns that most Smart City projects are implemented in a top-down approach and the term stakeholder engagement has become a leitmotif without any evidence of impact.



### 3. Smart Cities and the essentiality of stakeholder engagement

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#### 3.1. Defining Smart Cities

There is no universally accepted definition of Smart Cities. However, increasingly, the concept has come to be strongly associated with ‘a city seeking to address crucial urban challenges through the deployment of ICT-based solutions drawing upon available data, knowledge, finance and expertise of multiple stakeholders, often in a municipally-based partnership’ (Cardullo & Kitchin, 2019; Manville et al., 2012). In the UK, the British Standards Institution (BSI) has produced a Smart City Framework in which it defines the Smart City concept as an ‘effective integration of physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future for its citizens’ (British Standard Institution, 2014 p.4). Several other organisations have crafted their own definition of Smart Cities. However, despite the several definitions emerging, there seems to be agreement that every Smart City should have people, with their ideas, skills and needs, at its centre.

#### 3.2. Components of Smart Cities

Several components come together to make a Smart City. These components vary across countries, cities, and organisations. For example, according to the Smart City Framework recently developed by the BSI (PAS 181), the Smart City is: (1) visionary, (2) citizen-centric, and (3) digital, open and collaborative. It further notes that these guiding principles would be reflected in four main areas. The first is a visionary city, where the vision of the city’s future is clear, compelling, and jointly owned by all key stakeholders. Second is a citizen-centric city where there is belief in a detailed and segmental understanding of citizens’ and businesses’ needs, spaces and services, built around citizens’ needs and transformations, and *done with* citizens and businesses, *not to them* (emphasis added). Third is a digital city – where there is belief in enabling ubiquitous digitisation of the city, with connectivity and integration between people, places and things across the city, and where inclusive digitisation of the city is ensured, with no stakeholder group left behind. The fourth feature of Smart City is its openness and collaboration, where there is a belief in creating spaces and new opportunities for collaboration, opening up the city’s data to drive innovation and create new value, and sharing and reusing city assets and services. Finally, the Smart City is reflected in its physical, spatial and ecological environment.

From an EU perspective, a Smart City comprises three main components which serve as building blocks (Manville et al., 2012). The three components are: technology factors, human factors and institutional factors. Technology factors include: physical infrastructure, smart

technologies, mobile technologies, virtual technologies and digital networks. The human factors include: human infrastructure and social capital, while the institutional factors relate to governance, policy and regulation, and directives.

The characteristics of Smart Cities include: smart economy, smart environment, smart government, smart people, smart mobility and smart living.

1. **Smart economies** require joined up governance, services and interactions, within and outside the city, and which integrate private and public sector bodies, central and local government. Emphasis is placed on transparency, open data, e-government, and participatory decision-making and co-created services. Smart economies emphasise e-business and e-commerce, increased productivity, advanced manufacturing and delivery of services, as well as ICT enabled innovation and new business models. They focus on local and global inter-connectedness and international embeddedness with physical and virtual flow of goods, services and knowledge.
2. **Smart mobility** relates to ICT-supported, integrated transport and logistics systems. This comprises buses, trains, trams, metros, cars, bicycles and pedestrians using multiple transportation modes. Smart mobility emphasises the need for access to relevant and real-time information regarding transport modes and feedback technologies.
3. **Smart environment** brings into focus issues around renewable energy, ICT-enabled grids, smart metering, pollution control and monitoring, green buildings, urban planning and efficient use of resources and recycling. Examples include functional urban services, e.g. street lighting, waste management, and water and drainage systems monitored to reduce pollution.
4. **Smart people** requires digital inclusion: electronic skills, working in ICT-enabled environments, having access to education and training improve human resource capacity and engender creativity.
5. **Smart living** focuses on lifestyle, behaviour and consumption patterns that make use of ICT-enabled technologies in a healthy, safe and culturally vibrant and diverse urban environment. Quality accommodation, high levels of social cohesion and social capital are also emphasised in smart living.

Future Cities Catapult (2016) in their '*Global review of Smart City Demonstrators*' with special emphasis on UK case studies, highlight five characteristics of Smart Cities:

1. **City services**, which focus on: (a) smart traffic management through the use of sensors, cameras and networked traffic signals to optimise the flow of traffic; (b)

smart parking, ticketing, access control, ticketing management, parking guidance and automated slot management; (c) smart street lighting involves the replacement of existing street lights with more efficient LED lights, as well as the integration of communication platforms with other assets such as electricity, water, parking meters and environmental sensors; (d) smart waste management includes the use of analytics, routing algorithms and sensors in order to reduce waste, reuse and recovery of materials.

2. **Smart utilities**, i.e. the use of smart meters, smart grids and dynamic energy markets.
3. **Smart health** focuses on buildings that are appropriate for all ages, remote self-monitoring of chronic conditions, and assisted living technologies to support people to stay in their homes longer.
4. **Connected and autonomous vehicles** mainly focuses on driver assistance, namely, advanced vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) systems that use sensors and connections to other vehicles and back office systems to improve safety and reduce congestion; with conditional automation with human intervention when necessary (level 3) and high automation where the vehicle conducts all aspects of the driving task even if a human fails to respond to a request (level 4).
5. **Last mile supply chain and logistics** include: (a) green delivery vehicles, including electric vans and bicycle delivery systems to reduce emissions; (b) advanced algorithms and analytics within the distribution, storage and transport of goods to help companies optimise aspects of their operations; and (3) delivery drones and robots which help companies provide extremely fast and flexible service with lower environmental impacts at potentially lower prices.
6. **Next generation connectivity and data demonstrators** have become essential because the requirement for smart solutions cannot be met with today's connectivity networks. Hence, there is a need for faster internet connectivity which combines Wi-Fi, 3G, 4G, LTE, early 5G and radio frequency mesh networks.

### 3.3. Categorising Smart Cities and Smart City Initiatives

Smart Cities come in different forms and can be classified using multiple criteria. Future Cities Catapult (2016) categorises Smart Cities based on whether they are test beds or demonstration projects. They view test beds as physical or virtual infrastructure that enable experimentation, development or testing of products, providing solution service platforms for experimentation. Demonstrators aim to de-risk the development and scaling up of solutions and services not yet ready for mainstream market uptake by providing safe

environments for experimentation and innovation. Following this, they consider the status of the Smart City initiative and ascertain whether it is 'in delivery', complete or operational. In mapping Smart Cities across Europe, Manville et al. (2012) categorise Smart Cities based on four maturity levels. At the first maturity level, a Smart City only has a strategy or policy in place. At the secondary level, a city has a project plan or project vision which has not been piloted or implemented in addition to having level 1. At the third level, there is some pilot testing of Smart City initiatives, in addition to having levels 1 and 2. At the fourth maturity level, a Smart City has at least one fully launched or implemented Smart City initiative, in addition to having levels 1, 2, and 3.

Other criteria suggested include: (1) size of the initiative, whether in terms of the amount of funding invested or its geographical coverage, (2) location of the demonstration, including the public realm versus private properties or university campuses, brownfield sites versus functional urban areas, and (3) geographical spread, be it nationally or internationally.

The notion of a 'city', at least from the perspectives of eminent urban scholars like Saskia Sassen (2015), Edward Glaeser (2011), David Harvey (2008) and more recently, Samuel Stein (2019), is highly contested in terms of who owns it, who has the right to do what and who makes decisions about the city's future. All these nuances must be considered when defining a Smart City.

## 4. The growing importance of stakeholders in Smart Cities

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Increasingly, the concept of stakeholder engagement has become a central theme in most discussions about Smart Cities. There seems to be a growing consensus that the success of any Smart City depends to a large extent on how deeply Smart City initiators have engaged with different stakeholders within cities to understand their needs and priorities, which will in turn inform the Smart City solutions proposed. For example, a recent study commissioned by Lucy Zodion (DJS Research, 2016) into the opinions of senior management from 187 councils across England, Wales, Scotland, and Northern Ireland concluded that 'engaging citizens from the offset is a characteristic of a truly Smart City' (p.18) and that engaging citizens in plans for the design and architecture of Smart Cities is one of the seven considerations for optimising infrastructure in a Smart City (p.19). Similarly, the Future Cities Catapult (2016) concluded its global review on Smart City demonstrators with the statement that 'a major barrier to development and uptake of Smart City demonstrators or solutions is the lack of engagement, understanding and trust of people who are the end-users or are affected by these technologies' (p.65). The Huawei Smart City Indices of Smart Cities in the UK considers 'stakeholder engagement' and 'community reach' to be strategy and execution dimensions for evaluating Smart City initiatives.

Who constitutes a stakeholder in a Smart City, why they should be engaged, how they should be engaged and for what purpose they should be engaged are difficult questions to answer. Traditionally, stakeholders of Smart City Initiatives have comprised Universities with researchers (who possess highly technical skills in computing, data processing, modelling, analytics and have specialised labs to aid experimentation); as well as businesses and industry players who can take risks in funding the setting up and piloting of smart ideas that in turn can be scaled up and converted to marketable solutions; and local governments or city authorities who own most city assets like street lights and refuse bins, and who provide some urban services (Cowley, Joss, & Dayot, 2018; Leydesdorff & Deakin, 2010).

The dominance of these main actors in most Smart City initiatives has been criticised (Cardullo & Kitchin, 2019), necessitating the need for a much a broader definition of stakeholders, to now include: universities, businesses, city authorities, local residents or citizens, tourists, people living in the city but working elsewhere, people living in a different region but who use city facilities from time to time, charities and civil societies (Deloitte, 2015; BSI, 2014; Woods, Labastida, Chow, Citron & Leuschner, 2017). In fact, the current Smart City Framework of the UK developed by the British Standard Institution recommends segmented categorisation of stakeholders.

There are several arguments that justify why a broader group of stakeholders must be engaged. Deloitte (2015, p.30) justifies why city governments should engage citizens on six grounds.

- Citizens are voters who expect representation from elected politicians who have been given a clear mandate and are expected to live up to what they promise.
- Citizens are customers who expect good quality of services, namely, good information, digital channels, favourable opening hours for services provided non-digitally, short waiting times and reasonable prices.
- Citizens are subjects who expect the government to protect their safety. They require the right balance between personal freedom and the enforcement of law and order.
- Citizens are partners who expect to be taken seriously in the process of creating policy. They expect government to develop sound policies in spatial planning, economic development, social services and education.
- Citizens are local residents who expect their living environment to have a certain quality in terms of clean and green transportation and other services within reach.
- Citizens are tax payers who expect governments to be efficient and spend tax money wisely, expecting that the cost of living in the city would match the quality of living in the city.

Perhaps a more cogent reason to engage citizens in Smart City initiatives is the growing volume of urban data<sup>1</sup> harvested from citizens and used by dominant players in Smart City initiatives, namely global tech giants and industry-specific leaders, for diverse purposes. This unfettered access to urban data has in turn given rise to concerns over the monetisation of citizen data, data privacy, stewardship or governance, access and security, especially in the wake of Facebook's Cambridge Analytica data breach in 2018.

#### 4.1. Forms of stakeholder engagement in Smart City initiatives

There are different forms of stakeholder engagement and there is a degree to which each allows stakeholders to contribute towards, for example, imagining the urban future, defining the urban challenges, co-designing, and implementing smart solutions. Increasingly, project leads and city authorities have come under criticism for either not engaging with stakeholders early enough or by engaging in ways that fail to empower stakeholders, chiefly

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<sup>1</sup> Urban data comprise both personal information and information collected in a physical space in the city, where meaningful consent prior to collection and uses is hard, if not impossible to obtain.

local residents, to influence what is proposed as a smart solution, and how it is designed and operationalised (Cardullo & Kitchin, 2019; Future Cities Catapult, 2016).

Against this backdrop, many Smart City indices and frameworks (See Manville et al., 2012; BSI, 2014; Woods et al., 2017) have begun to rate highly Smart City initiatives that involve stakeholders at the early stages of the Smart City project.

Although there are several Smart Cities around the world and in the UK, none has so systematically and comprehensively documented the forms of stakeholder engagement it has conducted, the period over which the engagement took place, the forms of engagement conducted, the impacts it achieved, and which is publically available, than the Toronto Sidewalk Lab.<sup>2</sup> Over a period of 19 months (November 2017 to June 2019), the Sidewalk Lab claims it consulted approximately 21,000 people, organised 307 events which were viewed online by approximately 280,000 people, and attracted more than 11,000 visitors to Quayside, Toronto Waterfront since 16 June 2018. The project gave over 100 hours to co-design with communities, Residents Reference Panels volunteered approximately 1,700 hours of their time and Sidewalk Toronto Fellows committed approximately 2,300 hours. The Sidewalk Lab also worked with 75 experts, across six expert advisory groups.

The Sidewalk Lab adopted more than 12 forms of stakeholder engagements:

1. Publication of a public engagement plan outlining ways people could get involved across a variety of programmes;
2. Extensive engagement with public officials at all levels of government;
3. Initial design of a 'Responsible Data Use Policy Framework' laying out the project's proposed approach to data privacy, stewardship, access and security;
4. Formation of a 36 member Residents Reference Panel and a Fellows Programme;
5. Formation of Advisory Boards of local experts on six topic-specific issues, namely; community services, sustainability, mobility, digital governance, housing and the public realm;

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<sup>2</sup> Sidewalk Toronto is an innovation and funding partner of Waterfront Toronto, a local development corporation set up in 2001 to oversee the planning and development of Toronto's Central Waterfront. Sidewalk is a sister company of Google and a subsidiary of Alphabet. It has ambition to transform Quayside into a new model of urban development that will use digital innovations and contemporary planning ideals to: create direct jobs for 44,000 people by 2040, create a climate positive district that will cut down greenhouse gases by 89%, deliver affordable housing priced 40% below market rate, encourage more than ¾ of all trips to be done by light rail, cycling and walking, and enable an ecosystem where urban innovation can flourish (See <https://storage.googleapis.com/sidewalk-toronto-ca/wp-content/uploads/2019/06/21195824/The-Public-Engagement-Process-for-Sidewalk-Toronto.pdf>)

6. Town hall meetings;
7. Large-scale roundtable meetings;
8. Community meetings;
9. Opening of a workspace;
10. Opening an experimental office on 307 Lake Shore Boulevard, welcoming the public to learn about the project and participate in regular programmes held in partnership with local vendors;
11. Organisation of co-design sessions and workshops with seniors, youth and members of accessibility and indigenous communities;
12. Release of Draft Accessibility Principles;
13. Outreach to business, academic, non-profit, and institutional sectors;
14. Design jams – full day sessions for local residents to help shape the project;
15. Free summer camp for kids.

In spite of these different forms of stakeholder engagement, some key stakeholders, including the former CEO of Waterfront Toronto, a prominent local real estate developer, some academics and advocacy groups within the city have expressed concerns about: the close relationship between the leaders of Waterfront Toronto and Sidewalk Lab, the governance of the data to be collected and intellectual property. There is the fear of giving away too much for very little and that could potentially result in the development corporation's losing control over the project to the tech giant (Bliss, 2018). These concerns, however, do not take away the fact that the Toronto Sidewalk Lab has one of, or perhaps the only, Smart City proposal that has demonstrated how different stakeholders can be engaged from the very beginning and in a spirit of co-imagination and co-creation of solutions to urban problems. Those forms of stakeholder engagement used in the Toronto Sidewalk Lab which are centred on co-design can serve as reference when evaluating the nature of stakeholder engagement in Smart Cities in the UK.



## 5. Selection of UK Smart City case studies

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Although there are several Smart Cities in the UK, it is difficult to estimate their total number. Huawei's 2017 Smart City Index for the UK identifies 20 Smart Cities in the UK. In an EU-commissioned report mapping Smart Cities across Europe, Manville et al. (2012) indicated that the UK has more than 30 Smart Cities (p.39). In their global review of Smart City demonstrators, Future Cities Catapult (2016 p.48) makes mention of Smart City demonstrator projects in 90 towns and cities in the UK. However, given the practical constraints of time and, more crucially, the availability of published materials on stakeholder engagement, London, Manchester, Milton Keynes and Glasgow have been chosen for a review of the form and extent of stakeholder engagement underpinning their Smart City initiatives.

These four cities feature on both the 2017 Huawei Smart City Index of the UK and the Future Cities Catapult global review of Smart City demonstrators. Also, London, Glasgow and Manchester feature in the sample of 50 Smart City projects analysed in the European Commission's report on Smart Cities across Europe (See Annex 2, Manville et al., 2012, p.113). Furthermore, each of the chosen cities has Smart City initiatives covering at least two of the six areas highlighted in the Future Cities Catapult Report. Table 1 below summarises the considerations for the chosen cities.

**Table 1: Smart City sample selection**

City	Huawei Index Classification & Score	Future Cities Catapult Review Market Verticals	EU-Report Manville et al. (2012)
<b>London</b>	Leaders Overall=81.2 Strategy=80.9 Execution=81.6	(6/6) CS, SU, SH, CAV, LMLF, NGCDD	4/5 SG, SEc, SM, SEn, SP
<b>Manchester</b>	Contender Over =74.3 Strategy=73.7 Execution=74.9	4/6 CS, SU, CAV, LMLF	5/5 SG, SEc, SM, SEn, SP, SL
<b>Milton Keynes</b>	Contender Overall= 73.5 Strategy=75.8 Execution=71.1	CS, SU, CAV, LMLF	N/A
<b>Glasgow</b>	Contender Overall=71.9 Strategy=70.9 Execution=73	CS, SU	4/5 SM, Sen, SP, SL

**Note 1:** CS – City Services, SU – Smart Utilities, SH – Smart Health, CAV – Connected and Autonomous Vehicle, LMLF – Last Mile, Logistics and Fleet, NGCDD – Next-Generation Connectivity and Data Demonstrators

**Note 2:** SG – Smart Governance, SEc – Smart Economy, SM – Smart Mobility, SEn – Smart Environment, SP – Smart People, SL – Smart Living

Sources: Huawei (2017), Future Cities Catapult (2016), Manville et al. (2012).

## 5.1. The Research Approach

This review draws on secondary data on Smart City initiatives in the four cities. The data used comprises information on Smart City aspirations and the projects published on the websites of city authorities and their project partners. These two main sources are complemented by industry reports on Smart City initiatives in the selected study areas. Throughout the review, attention is paid to how the concept of ‘stakeholder engagement’ is mobilised, including; who are considered stakeholders of Smart City initiatives and why; the type of stakeholder engagement was conducted; the purpose of the stakeholder engagement; the stage within the Smart City initiative at which stakeholder engagement was carried out; and how the stakeholder engagement influenced the design and execution of the Smart City initiative.

## 6. Smart City case studies

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Each case study begins with a very brief profile of the city, followed by examples of challenge(s) facing the cities, the aspect of the Smart Cities that the initiative focuses on, the governance structure of the initiative and finally, the type of and approach to stakeholder engagement undertaken.

### 6.1. London

#### 6.1.1. Short profile

London<sup>3</sup> is the most populated city in the UK. Its population is currently 9.3 million<sup>4</sup> and is projected to hit 10 million by 2030. Administratively, it comprises 33 boroughs which come under the strategic authority of the Greater London Authority (GLA) - a top-tier administrative body responsible for strategic administration of Greater London - and the Mayor of London. London is also the home of the UK's central government, a global financial capital, and home to many renowned academic institutions and businesses. In short, London is a global city with a marked footprint in knowledge production, invention, entrepreneurship and home to more technology companies than any other European city (Greater London Authority, 2013). As of 2018, the London region was recognised as one of the most ethnically diverse mega-cities in the world, with about 40.2% of residents identifying with Asian, Black, Mixed or Other ethnic groups (GOV.UK, 2018).

#### 6.1.2. Urban challenges

The disproportionate concentration of people in London has considerable implications for urban services and infrastructure. According the Greater London Authority, congestion on London roads costs the economy £2 billion, and Londoners averagely spend 70 hours in traffic jams during peak times. Employment opportunities, skills upgrading, improved healthcare and transport services, and the management of energy and utilities, waste and pollution are all important challenges facing the city (Greater London Authority, 2013, p.14). The housing affordability crises facing both renters and prospective homebuyers in London's housing market and the concomitant health implications is also well noted (Prynn, 2019).

#### 6.1.3. Selected Smart City initiatives

There are several Smart City initiatives in London and this report does not aim to cover all of them. Rather, it adopts a pragmatic approach by focusing attention on those initiatives featured in the London Smart City Plan which have already begun (Greater London Authority,

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<sup>3</sup> This comprise the City of London and the Greater London Area.

<sup>4</sup> <http://worldpopulationreview.com/world-cities/london-population/> (Accessed 6 February 2020)

2016). The four Smart City initiatives reviewed are the London Datastore, CityDashboard: London, Wayfindr and the Smart Mobility Living Lab.

### *The London Datastore<sup>5</sup>*

The London Datastore is a free and open data-sharing platform where anyone can access data relating to London. It hosts over 700 datasets covering 17 topics, including arts and culture, business and the economy, championing London, crime and community safety, demographics, education, employment and skills, environment, health, housing, income, poverty and welfare, London 2012, planning, sport, transparency, transport and young people. Its aim is to make public data open and accessible, with a view to promoting citizen engagement, innovation and development of new applications.

### *The CityDashboard<sup>6</sup>*

The London CityDashboard is a website created by the Bartlett Centre for Advanced Spatial Analysis (UCL) in 2012<sup>7</sup>. It is a display of aggregated simple spatial data, including data in the public domain, from government departments, and from tech companies like Google and Twitter. It displays real-time data for weather, traffic cameras, tube line status, London cycle hire, air pollution, stock prices etc. One of the objectives of creating the dashboard is to provide citizens with real-time information which improves timely and informed decisions.

### *WayFindr<sup>8</sup>*

Wayfindr is a multiple-award-winning social tech non-profit organisation with ambitions to help the world's 285 million blind and partially blind people navigate indoor environments independently through on-site trials and consultancies.<sup>9</sup> It was formed in 2015 and it is based in London. Wayfindr was pioneered by the Royal London Society for Blind People (RLSB's) youth forum and digital product studios. In 2015, it trialled this innovation at the Euston Tube Station in London following a commission by London Underground. The initiative allowed blind and partially blind people who had smart phones to get audio directions from a smartphone app that interacts with beacons installed throughout the station to help them safely access the platform edge from the station entrance. According to the CEO, Wayfindr is indeed a collaborative initiative that adopts an open and inclusive design approach.<sup>10</sup> Wayfindr has now gone on to develop standards for audio navigation

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<sup>5</sup> <https://data.london.gov.uk/>

<sup>6</sup> <http://citydashboard.org/london/>

<sup>7</sup> <http://citydashboard.org/about.php>

<sup>8</sup> <https://www.rsb.org.uk/about/wayfindr-launches-major-london-underground-trial>

<sup>9</sup> <https://www.wayfindr.net/>

<sup>10</sup> <https://tfl.gov.uk/info-for/media/press-releases/2015/december/wayfindr-launches-with-major-london-underground-trial-at-euston> (Accessed 18 February 2020)

and in 2015, it received a \$1 million grant from Google.org as part of the Google Impact Challenge: Disability Programme. The grant is expected to help it accelerate its work in the subsequent three years.

#### *Smart Mobility Living Lab (SMLL)<sup>11</sup>*

The Smart Mobility Living Lab (SMLL) is an urban testbed for connected and autonomous vehicles that uses public and private roads in London to develop and validate new mobility and transport technologies in a real-world context. The project is underscored by concerns over London's growing population and their demand for new modes of transport and services. The over-arching goal of the SMLL is to help build safer, more intelligent and better joined-up transport systems that is capable of being scaled-up from test beds to market uptake. SMLL is a collaborative project that draws on the rich research eco-system in London by bringing together the experiences and expertise of technology providers and academics to facilitate learning.

The two environments where the demonstrations take place are the Royal Borough of Greenwich site and the Queen Elizabeth Olympic Park environment. The former allows more advanced testing and trials in a complex real-world environment while the latter offers a more open-campus-like setting. The hope is that by using these two test environments, inventors can build and learn from two distinct but connected datasets and help them refine their business models to attract investment quickly. SMLL has so far carried out different projects aligned with its goals. An example of such project is the GATEway<sup>12</sup> project in Greenwich which allowed the general public to take part in a driverless pod shuttle service trial and subsequently share their experience. The project is aimed at gaining valuable insight into new mobility solutions and how to overcome the cultural, societal and technical barriers to the adoption of automated vehicles.

#### 6.1.4. Governance

In each of the initiatives presented above, as well as in initiatives discussed elsewhere (Caprotti, Cowley, Flynn, Joss, & Yu, 2016), city authorities play a crucial role in imagining the urban future, funding specific projects, and releasing assets including public data for Smart City initiatives. For Smart City initiatives in London, the Greater London Authority and the Office of the Mayor of London constitute the two bodies charged with providing the overarching governance framework, sometimes with the support from technology companies, researchers from universities and civil society groups. The metropolitan authority is responsible for strategic development through the Smart London Board (Caprotti et al., 2016). The Board shapes the vision for London's Smart City initiatives and investment in data

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<sup>11</sup> <https://www.smartmobility.london/what-makes-smll-unique> (Accessed February 2020)

<sup>12</sup> <https://gateway-project.org.uk/> (Accessed February 2020).

infrastructure, and advises the Mayor on implementing new digital technologies to improve the greatest of performance across the infrastructure, utilities and public services in London<sup>13</sup>.

Since 2017 there has been a Chief Digital Officer position (established by the Mayor of London) to convene on behalf of the Mayor, and to build support for and take up of innovative, technology and data-led approaches to service delivery and public engagement.<sup>14</sup> For initiatives such as CityDashboard, leading researchers from UCL and technology companies like Twitter, Google, Yahoo and Vodafone all play crucial roles in keeping the dashboard running.

#### 6.1.5. Stakeholder engagement

The Smart London Plan outlines different ways in which City Hall and project partnerships of Smart City initiatives have encouraged stakeholders. 'Talk London' is an online community that encourage Londoners to share their concerns and suggestions on issues such as housing, the environment, transport, safety, jobs and others.<sup>15</sup> It purports to bring Londoners into the policy making process through online discussions, polls, surveys and online focus groups discussing a host of topics considered dear to London. For example, through the 'Priorities for London' survey, it was reported that more than 2,000 Londoners have shared their thoughts on the best and worst things about living in London, and what needs to be done to improve the city.<sup>16</sup>

Similarly, working alongside other cities around the world, a 24-hour hackathon-style climate change event was organised in London on 18 June 2015. This supported citizens to take direct climate action by developing innovative solutions to a climate change issue. The results of the Climathon engagement were featured in the UN's COP21 Climate Conference (Greater London Authority, 2016 p.15).

Other forms of stakeholder engagement in London Smart City initiatives in London include the Smart Mobility Living Lab in the Royal Borough of Greenwich. This is a test-bed for the public to test connected and autonomous vehicle technology safely and responsibly on public and private roads in a complex, real world environment. This lab brings together

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<sup>13</sup> <https://www.london.gov.uk/what-we-do/business-and-economy/supporting-londons-sectors/smart-london/smart-london-board> (Accessed 3 February 2019)

<sup>14</sup> <https://medium.com/@camdentheo/next-steps-in-digital-leadership-and-city-wide-collaboration-in-london-3655876e6cb1> (Accessed 3 February 2019)

<sup>15</sup> <https://www.london.gov.uk/talk-london/> (Accessed 3 February 2019)

<sup>16</sup> <https://www.london.gov.uk/talk-london/these-are-your-priorities-london> (Accessed 3 February 2019)

experience and expertise of diverse stakeholders, including technology providers, academics and local community.<sup>17</sup>

## 6.2. Manchester

### 6.2.1. Short city profile

Manchester is the second largest city in the UK, with a population of 520,215 as at 2014 (Manchester City Council, 2015, p.31). It also forms part of the Greater Manchester Metropolitan Area, a city region comprising 10 metropolitan boroughs and home to some 2.8 million people.<sup>18</sup> It hosts both the University of Manchester, the biggest University in the UK, and Manchester Metropolitan University. The city has deep roots in innovation and creation, rightly earning it the accolade of 'the city that makes things happen' (The Manchester Partnership, 2006).

Manchester suffered massive economic and population decline in the 1970s following de-industrialisation, but the city never lost its 'originality, creative heart and soul' and is now reclaiming its position as the 'principal economic driver of the North of England' (The Manchester Partnership, 2006). The Our Manchester Strategy (2016 – 2025) outlines five aspirations for the city:

- a thriving city which creates great jobs and healthy businesses;
- a city filled with talent both home-grown and the best from the world;
- a fair city with equal chances for all to unlock their potential;
- a great place to live with lots of things to do; and
- a city buzzing with connections, including world-class transport and broadband (Manchester City Council, 2019).

### 6.2.2. City challenges

Like most major cities, Manchester faces several urban challenges. These range from entrenched health inequalities, vehicular congestion, an aging population, housing affordability, to climate change and a digital divide (Manchester City Council, 2019). Life expectancy for both men and women born and living in Manchester still ranked lowest in England and Wales, although has improved (Manchester City Council, 2015 p.35). The recent State of the City Report (2019 p.191) reveals that average journey times on some road

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<sup>17</sup> <https://www.smartmobility.london/what-makes-smll-unique> (Accessed 3 February 2019)

<sup>18</sup> <https://ukpopulations.com/greater-manchester-population/> (Accessed 4 February 2020).

networks (A and B roads) have been gradually increasing since 2005. The same report also highlights increasing reporting of hate crimes and anti-social behaviours (p.146).

### 6.2.3. Smart City initiatives

The Manchester Oxford Road Corridor is now the city's innovation district. It is a partnership between two Manchester universities, the City Council, NHS Foundation Trust, property company Bruntwood, Royal Northern College of Music and representatives from the city's cultural institutions. Located south of the city centre, the corridor is at the heart of the city's knowledge economy and it is anticipated to be Manchester's cosmopolitan hub and world-class innovation district. There are approximately 16 Smart City initiatives in Manchester, although not all are initiated, led or funded by the City Council nor have the City Council as a committed collaborator.<sup>19</sup> Three Smart City projects that have put Manchester on the map of UK Smart City are CityVerve, Triangulum and Open Data Manchester.

#### *Manchester CityVerve*

The CityVerve Project was established as a demonstrator for Manchester in 2016. It had a two-year remit to demonstrate the capability of Internet of Things (IoT) applications to address barriers to deploying Smart City objectives, in terms of governance, network security, user trust and adoption, interoperability and scalability.<sup>20</sup> It seeks to deliver transformative benefits in new business and jobs, better healthcare, transport and education, safer streets, and more engaged and empowered citizens. CityVerve's approach to a Smart City is underpinned by its five steps<sup>21</sup> namely:

- **A truly open platform:** this treats the city as a living breathing organism by giving it a technology layer as a central nervous system. The platform creates a catalogue of data that can unite unlimited number of applications in response to the city's changing requirements.
- **Identifying the opportunities:** CityVerve is both needs-driven and benefit-led and focuses on four key areas, namely; health and social care, energy and environment, travel and transport, and culture and public realm
- **Enabling real community:** This focuses on reigniting connections that turns a neighbourhood into a community

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<sup>19</sup> [https://www.manchester.gov.uk/site/custom\\_scripts/smarter\\_city/case\\_studies.php?id=138650](https://www.manchester.gov.uk/site/custom_scripts/smarter_city/case_studies.php?id=138650) (5 February 2020)

<sup>20</sup> [https://www.manchester.gov.uk/site/custom\\_scripts/smarter\\_city/case\\_studies.php?id=178563](https://www.manchester.gov.uk/site/custom_scripts/smarter_city/case_studies.php?id=178563) (Accessed 5 February 2020)

<sup>21</sup> <https://cityverve.org.uk/what-is-cityverve/> (Accessed 18 February 2020).



- **Open innovation:** This entails open calls and events offering challenges, opportunities and application program interface (APIs) to both developers and innovators.
- **Evaluation:** The future of CityVerve will be informed by rigorous evaluation of the project to understand the usefulness of theory for the real world in which they have been applied.

The £16 million project was funded by Innovate UK (£10 million) and the private sector (£6 million) and is being delivered by a consortium of 21 organisations, including Manchester City Council, Manchester Science Partnerships, the University of Manchester, Cisco, BT and others. The project has also received backing from the central government.

CityVerve's innovative elements include the setting up of a biometric sensor network to help improve responses to patient conditions and improving local healthcare services; deploying sensors in parks along commuter and school routes to track the progress of individuals and teams competing against each other; 'talkative bus stops' which convert 'flag and pole' into safe places with location-based services, sensors, mobile apps and intelligent signage, enabling people to check-in to their bus stop and let the bus operators know they are waiting.<sup>22</sup> Other innovative elements include smart lighting for traffic management, bike sharing and smart air quality monitoring. These initiatives deployed digital signage and sensors to help passengers check-in to receive information and provide bus operators with real-time information. The project was praised by all its partners after it emerged as the winner of £10 million Government-led technology competition in the UK (See Footnote 20).

### *Triangulum*

Triangulum is part of a €25 million Horizon 2020 funded Smart City green initiative supported by a consortium making up the Oxford Road corridor in Manchester.<sup>23</sup> With three forerunner cities (Eindhoven (Netherlands), Stavanger (Norway) and Manchester) and three potential 'follower cities' (Leipzig (Germany), Prague (Czech Republic) and Sabadell (Spain)) the Triangulum project would transform designated urban districts into 'smart quarters' (Caprotti et al., 2016). The Chinese metropolitan area of Tianjin has been selected as an observer city that creates opportunities for industrial and private sector partners involved in the project to access and exploit the Chinese Smart City market.<sup>24</sup>

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<sup>22</sup> <https://www.gov.uk/government/news/manchester-wins-10m-prize-to-become-world-leader-in-smart-city-technology> (Accessed 5 February 2020).

<sup>23</sup> [https://www.triangulum-project.eu/?page\\_id=82](https://www.triangulum-project.eu/?page_id=82)  
[https://secure.manchester.gov.uk/news/article/8098/triangulum\\_project\\_wins\\_public\\_building\\_energy\\_project\\_of\\_the\\_year\\_at\\_2018\\_energy\\_awards](https://secure.manchester.gov.uk/news/article/8098/triangulum_project_wins_public_building_energy_project_of_the_year_at_2018_energy_awards) (Accessed 5 February 2020).

<sup>24</sup> [https://www.triangulum-project.eu/?page\\_id=2355](https://www.triangulum-project.eu/?page_id=2355) (Accessed 18 February 2020)

Over the five-year period ending in 2020, Triangulum was expected to transform the Oxford Business Corridor into a Smart City district.<sup>25</sup> This transformation would be evident in renovations to historical buildings, introduction of an autonomous energy grid to supply the entire district with heat and electricity. Under the project, all conventional cars fuelled by petrol and diesel would be banished from the new smart district, making room for only electric vehicles, bicycles and the 'city's Metrolink' electric trams.<sup>26</sup> This would form part of efforts to reduce congestion and improve last-mile fleet and logistics to the corridor.

Triangulum was expected to integrate mobility, energy and ICT around existing infrastructure assets belonging to partners in the Manchester Corridor (Caprotti et al., 2016). The project would use data visualisation techniques that have been developed as part of the DIMMER project - a 3D district information model, with detailed energy planning scenarios, which provides real-time energy consumption information in building and district environments.<sup>27</sup> Triangulum has already started making strides after winning the 'Public Building Energy Project of the Year' at the 2018 Energy Awards.<sup>28</sup>

### *Future Everything*

Future Everything is a platform that brings people together to discover, share and experience new ideas for the future. Established in 1995 by Drew Hemment<sup>29</sup>, Future Everything explores the intersection of technology, art and culture by connecting with a global community of thinkers, artists and policy makers. It has evolved from its origins as an annual festival to an innovation lab and cultural agency. More specifically, the platform brings people together to question the future of technology through collaboration and play, champion grass roots innovation, create new opportunities through art commissions, advocate for citizens and communities in future digital culture and learning, through doing and sharing best practice.

Future Everything regularly commissions and produces art in response to emerging digital cultures. They work collaboratively with communities and organisations to understand complex issues and to co-create and test possible solutions, often in a playful way and making the most out of technology.<sup>30</sup> Future Everything support grassroots innovation in the digital creative economy making it possible for artists, programmers and coders to

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<sup>25</sup> <https://www.mui.manchester.ac.uk/research/projects/triangulum/> (Accessed 18 February 2020)

<sup>26</sup> [https://www.manchester.gov.uk/site/custom\\_scripts/smarter\\_city/case\\_studies.php?id=138652](https://www.manchester.gov.uk/site/custom_scripts/smarter_city/case_studies.php?id=138652) (Accessed 5 February 2020)

<sup>27</sup> [https://www.manchester.gov.uk/site/custom\\_scripts/smarter\\_city/case\\_studies.php?id=138637](https://www.manchester.gov.uk/site/custom_scripts/smarter_city/case_studies.php?id=138637) (Accessed 6 February 2020).

<sup>28</sup> [https://secure.manchester.gov.uk/news/article/8098/triangulum\\_project\\_wins\\_public\\_building\\_energy\\_project\\_of\\_the\\_year\\_at\\_2018\\_energy\\_awards](https://secure.manchester.gov.uk/news/article/8098/triangulum_project_wins_public_building_energy_project_of_the_year_at_2018_energy_awards) (Accessed 5 February 2020).

<sup>29</sup> <https://futureeverything.org/people/drew-hemment/> (Accessed 6 February 2020)

<sup>30</sup> <https://futureeverything.org/how-we-work/> (Accessed 5 February 2020)

participate in hackdays and innovation challenges. As a voluntary initiative, it relies on funding from its projects and services.

#### 6.2.4. Project governance

It is not entirely clear who does what within the Smart City initiatives discussed above. However, since most initiatives are spatially defined, the Manchester City Council tend to play a crucial governance role by ensuring that the initiatives are aligned with the visions set out in the Our Manchester Strategy (2016 – 2025). Thus, for CityVerve, the project is led by the Manchester City Council in partnership with public and private sector bodies, including the University of Manchester, Manchester Metropolitan University, Central Manchester Hospitals NHS, Transport for Greater Manchester, Manchester Science Partnership, Ordnance Survey and private technology companies like Cisco, BT and Siemens, who bring both expertise and resources to help realise the Smart City aspirations (Caprotti et al., 2016).

For Triangulum, although the project is led by Fraunhofer IAO, a German institute with expertise in Industrial Engineering that assists companies and public-sector bodies to develop strategies<sup>31</sup>, business models and digital solutions, it works closely with 23 European partners from urban municipalities, research and industry to replicate the project successes in follower countries. However, locally, the Manchester City Council in partnership with Manchester University, Manchester Metropolitan University, Siemens and the digital technology company Clicks and Links all play an instrumental role in ensuring that the initiatives are aligned with the city's smart ambitions (Caprotti et al., 2016).

As a voluntary initiative, Future Everything has a board of directors and a team carefully constituted to facilitate the range of activities it supports. This notwithstanding, Future Everything works closely with public sector, including Manchester City Council, and other technology companies as part of the city's smart agenda.

#### 6.2.5. Stakeholder engagement

The 'State of the City Report 2019', highlights that Manchester City Council adopts a consultative approach to understanding the challenges citizens face as well as their expectations for their future; the Manchester Strategy is a direct output of this consultative process. Also, many people have hailed the 10 'MiGuide' interactive digital touchscreens installed across the city as an innovative way in which the city is engaging with both citizens and visitors. MiGuide provide locals and visitors with up-to-date information about the city.<sup>32</sup>

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<sup>31</sup> <https://www.iao.fraunhofer.de/lang-en/about-us/fraunhofer-iao.html> (Accessed 5 February 2020)

<sup>32</sup> <http://www.mancunianmatters.co.uk/content/011159303-let-miguide-you-round-city-manchester-unveils-world-leading-interactive-touch> (Accessed 6 February 2020).

However, it is unclear as to how each of the Smart City initiatives discussed above have conducted broader stakeholder engagement beyond those typically considered as project partners. For example, it is unclear from both the City Council and the project partners, what role local residents played in the conceptualisation, design and implementation of the 'talkative bus stops' or the sensors for air quality monitoring under the CityVerve Project. Similarly for the Triangulum project, it is unclear as to the specific ways in which the project has engaged with stakeholders beyond the project partners.

The Future Everything project has taken a different approach by extending its stakeholder engagement towards ordinary people who appreciate digital culture. It adopts a co-design approach to engagement by crowdsourcing ideas through festivals and living lab settings. While not suggesting that participants who take part in the living lab end up co-creating digital artefacts, the fact that the project makes room for the public to have input into the concept, development and testing processes distinguish it from other Smart City initiatives in Manchester.

## 6.3. Milton Keynes

### 6.3.1. Short city profile

Milton Keynes has always embraced modernity, being one of the New Towns built in the UK in 1967 to accommodate about 60,000 people (Milton Keynes Futures 2050 Commission, 2016). The city's grid network of roads, boulevards and large public spaces is unique.<sup>33</sup> The population had grown to 267,000 as of 2014 (ibid) and it is expected to grow even further, with estimates up to 325,000 by 2037 (Milton Keynes Futures 2050 Commission, 2016). Strategically located in the middle of the Cambridge-Milton Keynes-Oxford arc as well as within the 'London Mega Region'<sup>34</sup> (Government Office for Science, 2016), Milton Keynes appeals to the knowledge workforce who commute from London and work in Milton Keynes growing high-tech and service industries. The city is located at the heart of England's High Performance Industry Cluster and it is touted as the only UK city specifically designed for business growth from its very inception.<sup>35</sup>

The city factsheet published by Centre for Cities states that, as of 2018, Milton Keynes ranked fourth out of 63 cities in terms of business start-ups per 10,000 population, with a score of 80.97.<sup>36</sup> Again, renowned businesses, including Network Rail, Volkswagen Financial Services,

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<sup>33</sup> <https://www.theguardian.com/cities/2017/jan/20/50-reasons-love-milton-keynes-concrete-cows-wd-40> (Accessed 7 February 2020)

<sup>34</sup> This is a city region of 20 million people and comprises small and medium size cities closer to London, including, Reading, Milton Keynes, Oxford and Cambridge.

<sup>35</sup> <https://www.investmiltonkeynes.co.uk/> (Accessed 7 February 2020)

<sup>36</sup> <https://www.centreforcities.org/city/milton-keynes/> (Accessed 7 February 2020)

Red Bull and Nifty Lift, have all chosen Milton Keynes as their national headquarters. The city also hosts the Open University, the first public distance learning university in the UK.

### 6.3.2. City challenges

According to the MK Futures 2050 Commission report (2016), 'strengthening the city's human capital' and 'harnessing transport innovations to improve mobility for all' remain the two biggest challenges that the city will face in the future (p.31). However, there are present challenges the city needs to deal with. A 'new town' developed in the late 1960s, most of the city's infrastructure, namely social housing and grid roads, were developed almost simultaneously and in a short time period. Hence, all are now due for replacement but the city faces a £73 million shortfall for local infrastructure projects. Furthermore, Milton Keynes is in the top ten UK cities with the highest per capita carbon emissions: 80% of households own a car and 29% of the journeys to school are by car, higher than the national average.

The city also faces health challenges, with almost three quarters of adults in Milton Keynes being overweight or obese (Milton Keynes Futures 2050 Commission, 2016). Housing remains a problem as the supply of allocated and consented land for housing is under the control of a very small number of national landowners who are not house builders. Equally disturbing is the level of deprivation in parts of the city.

### 6.3.3. Smart City initiatives

MK:Smart was an Open University-led £16 million initiative supported by a consortium of local and national partners.<sup>37</sup> It received a further grant of £8 million from the Higher Education and Funding Council for England. The MK:Smart project covered seven core areas: data, transport, energy, water, enterprise, citizens and education. All these seven core areas draw a great deal from the MK Data Hub.

#### *The MK Data Hub*

At the heart of the MK:Smart agenda was the MK Data Hub (Caprotti et al., 2016). The Hub was a data infrastructure which collects, integrates and use large amounts of both local and national open data sourced from diverse sources, including key infrastructure networks, sensor networks, social media and crowdsourcing platforms, for different uses. The data at the Hub can be accessed by the public in a form that is convenient and user-friendly. The Hub holds over 819 unique datasets, covering education, transport, business, energy, environment, sensors, statistics and water.<sup>38</sup> The MK Data Hub also helps the City Council, communities and SMEs to access and make sense of urban data through analytics, and visual

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<sup>37</sup> <http://www.mksmart.org/transport/> (Accessed 7 February 2020)

<sup>38</sup> <https://datahub.mksmart.org/> (Accessed 7 February 2020).

and audio representations. Data from the Hub have been used as a teaching aid in a primary school to improve pupil digital skills (Wolff, Kortuem, & Cavero, 2015).

### *MotionMapp App*

Beyond the MK Data Hub, the city has served as a test-bed and demonstration site for intelligent mobility and transport projects as part of its vision to develop a citywide travel integration system. Recently, the city successfully piloted driverless cars and it is already considering using self-driving pods for short distances around the city centre. This formed part of the 'Low Carbon Urban Transport Zone (LUTZ) research and development programme (Caprotti et al., 2016). In relation to the city's integrated transportation plan, the Open University has developed the MotionMap app. The MotionMap app combines data from transport operators and authorities with voluntary public data that is customised to different individuals and trips.<sup>39</sup> MotionMap provides real-time travel information about how busy shops are, the availability of parking spaces, and whether there are empty seats in the oncoming bus. The app can also be used to help travellers evaluate the options available for walking, using a bus, cycling or driving a car. The app also provides data on bus routes, including walking times to and from bus stops.

### *OurMK*

In addition to the technical and top-down digital innovations being implemented by the city, MK:Smart also recognised the need to engage citizens to crowdsource ideas and suggestions to help address some of the problems it faces. The OurMK website<sup>40</sup> was a platform through which residents could share their insights as to how to improve their communities. The platform also held a 'Citizen Ideas Competition' which allowed residents to propose innovative ideas to address some of the problems facing their local communities. These ideas were evaluated by technical experts and successful pitches were shortlisted and supported with a budget of up to £5,000 from OurMK. Successful candidates were given technical support and a mentor to improve their ideas into market solutions.

One of the city's first citizen-led initiatives was the Milton Keynes Indie Food Forum and Food Passport which created a food forum for local producers and retailers. A 'Food Passport' contained information on independent food vendors and producers in Milton Keynes, as well as local food events. The first 100 food passports produced were all sold and local support for the initiative culminated in the MK Feast event held on 22<sup>nd</sup> February 2015,

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<sup>39</sup> [https://www.youtube.com/watch?time\\_continue=97&v=VWQNmJrjC58&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=97&v=VWQNmJrjC58&feature=emb_logo) (Accessed 7 February 2020)

<sup>40</sup> <https://ourmk.org/> (Accessed 7 February 2020)

which was attended by over 3,000 visitors and supported by 25 local food and artisan sellers.<sup>41</sup>

#### 6.3.4. Project governance

As part of its efforts to realise the aspirations in the Milton Keynes Futures 2050 Commission report, the Milton Keynes City Council is a key exponent of the MK:Smart initiatives. The City Council has shown its support for the smart initiatives partly through its MK Digital Strategy 2018 – 2025 which highlights digital connectivity, digital services and digital economy as its three priority areas (Milton Keynes City Council, 2018), and partly through bringing together different consortia to deliver a host of smart initiatives. The City Council has been working with a consortium of telecommunication and internet providers to promote the city as an area for the testing of 5G networks. By allowing thousands of sensors to be installed on city assets like lamp posts and bins, and allowing the Open University to host the MK Data Hub, it would seem that it is the City Council and the Open University who constitute the primary governing bodies for the MK:Smart project. There are other project partners including the University of Bedfordshire, University of Cambridge, BT, Anglian Water, Community Action:MK and others, as well as associated partners, including E.ON, Huawei, Samsung, Tech Mahindra etc. It is unclear what specific roles these project partners play in the governance of the MK:Smart project.

#### 6.3.5. Stakeholder Engagement

The MK:Smart project adopted a range of stakeholder engagement approaches. These ranged from forms of engagement where ordinary citizens had very limited or no role in the smart initiative designed, trialled and implemented, through to initiatives conceived, implemented and led by ordinary citizens. In the more conventional approach, residents were primarily engaged through the sharing of information regarding, for example, their mode of transport, mobility patterns and consumption of utilities. The MK Data Hub and the MotionMap App are good examples of instances where stakeholder engagement only takes place at the user stage.

MK:Smart boasts of combining face-to-face and crowdsourcing activities to collect data from citizens. It claims that it collected data from over 6,000 people through face-to-face conversations within communities and more than 7,700 people had visited its award-winning OurMK website. More distinctly, the MK:Smart project has also demonstrated that it was sensitive to the shortcomings of the top-down approach to stakeholder engagement by supporting the 'OurMK project' which allowed citizens to propose, pilot and implement

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<sup>41</sup> [https://ourmk.org/files/6914/6351/0912/ImpactCaseStudy\\_Food.pdf](https://ourmk.org/files/6914/6351/0912/ImpactCaseStudy_Food.pdf) (Accessed 7 February 2020).



initiatives intended at addressing problems facing the city. The MK Food Passport Scheme is a classic example of a citizen-initiated, citizen-led project.

## 6.4. Glasgow

### 6.4.1. Short city profile

Glasgow is Scotland's most populous city and the fourth largest city in the UK, after London, Birmingham and Leeds. It is one of the 32 Council areas in Scotland. The city's population is projected to increase by 4% from 615,070 in 2016 to 639,657 by 2026. In 2018, the city's population was 626,410.<sup>42</sup> Glasgow is home to several cultural, historical and heritage sites in the UK. Beside its impressive Victorian architecture and lively city centre, the city has also experienced economic decline following deindustrialisation. More recently, Glasgow has rebranded itself to become one of the 'first Smart Cities in the world' (Davies, 2014). In 2013, it beat 29 other cities within the UK to emerge winner of the 'Future Cities' Competition which came with a grant of £24 million awarded by Innovate UK. With a plethora of Universities, including the University of Glasgow, University of Strathclyde, and Glasgow Caledonian University, Glasgow is able to attract and then retain the creative classes, who have become instrumental in meeting the city's smart agenda. The city has also leveraged its successful organisation of the 2014 Commonwealth Games to drive forward its smart agenda.

### 6.4.2. City challenges

Despite the recent success stories, Glasgow also faces several challenges. Perhaps most well-known is the poor health situation among Glaswegians, sometimes called the 'Glasgow Effect'. It is claimed that babies born in Glasgow are expected to live the shortest lives in Britain and that a quarter of people in Glasgow will not reach their 65<sup>th</sup> birthday (Ash, 2014). Also, in a report profiling the health and wellbeing in Greater Glasgow and Clyde, published by Glasgow Centre for Population Health, Shipton and Whyte (2011) showed that, among other things, mental health-related drug deaths in Glasgow were 105% higher than the Scottish average. Again, Glasgow fared poorly when compared with the average for Scotland across a number of community and structural factors, including perception of local crime, worklessness measured in terms of the number of Jobseeker's Allowance claimants, neighbourhood satisfaction and overcrowding (Shipton & Whyte, 2011 p.8).

### 6.4.3. Smart City initiatives

Future City Glasgow is the city's umbrella Smart City initiative. The city claims that its Future City Glasgow is an ambitious programme designed to open up Glasgow 'like never before'

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<sup>42</sup> [https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/glasgow-city-council-profile.html#household\\_projections](https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/glasgow-city-council-profile.html#household_projections) (Accessed 10 February 2020)



by developing series of initiatives to showcase the exciting potential Smart City technology offers'.<sup>43</sup> Future City Glasgow brings together investments and digital innovations in four thematic areas: the Glasgow Operations Centre, Glasgow Data, Demonstrator Projects and Engagement.

### *The Glasgow Operations Centre*

The Glasgow Operations Centre is a modern integrated traffic and public safety management system which brings together CCTV cameras in public spaces, security in the City Council's museums and art galleries, traffic management and police intelligence. The Operations Centre's main objectives include enhancing the management of events and incidents, reducing and preventing crime and anti-social behaviour, improving incident response times and embedding more intelligent working practices with all key partners (Caprotti et al., 2016 p.25). The centre has more than 1,000 screens monitoring different part of the city using real-time data from 400 HD upgraded CCTV cameras across the city centre as well as sensors monitoring traffic across the city, police intelligence, security services, community enforcement patrols and emergency services. According to Davies (2014), half of the £24 million of the Future Cities grant from Innovate UK has been invested in the Operations Centre.

### *Open Data Glasgow*

Under the data stream, the city of Glasgow is bringing together large volumes of non-sensitive and non-personal data about the city held within different organisations, and doing so in ways that can empower everybody to harness, use and combine it ways to give better understanding of the city and contributing to making Glasgow a better place to live, work and play. Consequently, the city has created 'Open Data Glasgow' following the 2013 Open Data Charter by the G8 and encouragement by the UK's Open Data Institute (ODI) and Open Knowledge (OKF). The Data Hub brings together over 370 data sets held by over 60 different organisations. The data sets relate to issues regarding community, culture, leisure and sport, economy and finance, education, environment, governance and democracy, health and social care, justice and public safety, population and society and transport.<sup>44</sup> It is claimed that the Open Data project would bring the following benefits from data providers, data users and data developers; increase transparency, improve engagement between service providers in the city and communities, improve planning and regeneration, enable the re-design of city services, shape policy decisions and stimulate innovation to create economic growth.

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<sup>43</sup> <https://futurecity.glasgow.gov.uk/> (Accessed 11 February 2020)

<sup>44</sup> <https://data.glasgow.gov.uk/group> (Accessed 11 February 2020)

### *Demonstrators*

The city's demonstrator projects cover energy, active travel, social transport and intelligent street lights.

1. **Energy:** 'Glasgow City Energy'<sup>45</sup> is a collaboration involving Glasgow Company, Integrated Environmental Solutions, designed to map and simulate the energy consumption of residents and businesses across Glasgow. Users can enter information about their property, where they live or work and the model would simulate and calculate their anticipated energy consumption. Other initiatives under energy include a web portal where residents can 'find registered/approved services and technology providers who can install retrofit solution for them'. Again, the University of Strathclyde is using low cost sensors in homes across Glasgow to test whether insulation systems works effectively.
2. **Active Travel:** the city is encouraging cycling as part of efforts to improve congestion and environment. A cycling app provides a platform for cyclists to map their movement around the city, publishing known and unknown routes and their conditions. This information is believed would help other users with better planning. In addition, a walking app encourages residents and visitors to explore the city's neighbourhood on foot.
3. **Social Transport:** Future City Glasgow has introduced an industry standard smart phone device to help drivers with scheduling, routing, management reporting and vehicle tracking.
4. **The Intelligent Street Lighting Initiative**<sup>46</sup> involves the introduction of smart energy efficient LED lighting systems which automatically turn on and off following the sensing movement or the absence of same. These sensors also monitor footfall, noise levels, air pollution and movement detection which send real-time data to the Operation Centre to help monitor street disturbances and to improve community safety responses. These intelligent smart centres are deployed along cycle paths and in open spaces.

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<sup>45</sup> <https://futurecity.glasgow.gov.uk/energy/> (Accessed 11 February 2020)

<sup>46</sup> <https://futurecity.glasgow.gov.uk/intelligent-street-lighting/> (Accessed 11 February 2020).

### *Citizen Engagement*

The fourth and final strand of the Future City Glasgow programme is Citizen Engagement. The city has put in place a range of engagement hubs to communicate to citizens the different strands of project under the Future City Programme and the power of the Open Data.<sup>47</sup>

#### 6.4.4. Project governance

Although not explicitly indicated, like the other case studies reviewed in this report, different strands of the Future City Programme are likely to have different governance framework in terms of who leads the project and how important decisions are made. The Glasgow City Council, the University of Strathclyde, the Scotland Police and NHS Scotland and some private companies appear to be the main collaborators and partners involved in terms of crucial decision-making regarding the Future City Programme.

#### 6.4.5. Forms of stakeholder engagement

As with Milton Keynes, stakeholder engagement is one of the main strands of the Future City Glasgow programme. On the website of Future City project and within the Open Glasgow 'End Stage Report', there is a strong emphasis on local residents, communities, visitors and businesses when referring to stakeholders. In line with this view, the Future City Programme has undertaken forms of stakeholder engagement that both top-down and co-productive.

The top-down approach is seen in initiatives that provide or crowdsource data from the public without any meaningful input over how the data is managed and presented. This involves the use of different mobile applications, including the MyGlasgow and GoCycle apps that allow residents to share information regarding specific issues in the city and cycle routes. The 'Open Data Glasgow' website is an entry point for finding out information about the project and the product it offers for both citizens and organisations in the city (Future City Glasgow, 2015). The project has also made case study videos that tell stories about the city and its future aspirations of being a cycling city<sup>48</sup>, a green and sustainable city<sup>49</sup>, and a digitally connected city<sup>50</sup>. A social media presence used Twitter and Facebook to allow the public to share their insights and concerns regarding living in the city.

On the other hand, there are specific initiatives in which the Future Glasgow Project adopted a citizen-led or co-productive form of stakeholder engagement. Examples of such bottom up approaches include, the Community Gardening Project<sup>51</sup>, which allows local communities to

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<sup>47</sup> <https://futurecity.glasgow.gov.uk/engaging-the-city/> (Accessed 11 February 2020).

<sup>48</sup> <https://www.youtube.com/watch?v=NDg5-vHH3es> (Accessed 11 February 2020)

<sup>49</sup> <https://www.youtube.com/watch?v=qwcTbvC-5GQ> (Accessed 11 February 2020)

<sup>50</sup> [https://www.youtube.com/watch?v=5n0wX3\\_QLrc](https://www.youtube.com/watch?v=5n0wX3_QLrc) (Accessed 11 February 2020).

<sup>51</sup> <https://www.urbanroots.org.uk/community-gardeners/> (Accessed 11 February 2020).

easily identify vacant and derelict land that are not yet ready for development and use them for gardening. Residents used maps, prepared by local communities, including Citizen Mapping, #SocEntMap Glasgow, Young City Mapping, Heritage Mapping to help them find vacant lands for the community gardening project. This project forms part of the City Council's strategies to address perennial issues about surface water management and flooding. However, to the community groups, the project is also part of a local grassroots campaign to encourage local production and consumption of food.

Furthermore, for more than four weeks, Glasgow Future City Project also organised hackathons at different sites across the city. This brought together citizens with different talents and backgrounds to create products and services that could help the city improve its public safety, energy, health and transport challenges.<sup>52</sup> For the public safety hackathon, the winners developed a mobile app that simplifies interaction between the public and public services; the energy hackathon winners designed an energy reporter system for use in council buildings in Glasgow; the winners of the health hackathon developed a prototype smart pedometer to encourage young people to improve their health and be involved in public spaces in Glasgow; while the winners of the transport hackathon team developed an app that helps local authorities to leverage their car fleet using data from the road networks. Additionally, to incentivise innovation, each of the four hackathons offered a prize of £20,000 to the winning team as seed funding for a new enterprise.

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<sup>52</sup> <https://futurecity.glasgow.gov.uk/hacking-the-future/> (Accessed 11 February 2020).

## 7. Summary of findings

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### 7.1. Case study observations

#### 7.1.1. Data

It is clear from the case studies that city authorities and their project partners primarily justify their campaign to become a Smart City based on the proliferation of non-personal and non-sensitive data that can be harvested, organised, interpreted and used to improve urban living. The relevance of the project is rationalised based on their instrumental outcomes. Good examples include narratives of how access to urban data can help citizens plan their journeys, as reflected in London's City Dashboard and Manchester's 'talkative bus stop'. It is also true that the majority of the cities boast about giving citizens control over city data by giving open access to data, as illustrated by the London DataStore and Open Data Glasgow. However, nearly all the case studies are silent about the more sensitive issues surrounding the harvesting of public data. Consistent with criticisms in both academic literature (Kitchin, 2018; Scassa, 2018; Thatcher & Dalton, 2018) and specific industry reports (UNESCO 2019), sensitive but crucial matters regarding the politics of urban data, data assemblage, data ownership, data control, data security, data integrity and monetisation of data are mostly omitted from the different components of the Smart City initiatives.

We know that as part of the Mayor of London's ambition to make London the world's smartest city, it has created the office of Chief Digital Officer to work with an Advisory Board of Digital Leaders in order to realise its vision. Although such initiatives may be linked with data transparency and good data governance, they do not go far enough to address the legitimate concerns people have about the ever-increasing amount of data harvested from them and the usefulness of city dashboards in terms of their comprehensibility, usability, ethics and trustworthiness (Kitchin & McArdle, 2018).

In view of this, there is the need for further empirical work to explore what is being done to address growing public concerns about urban data harvesting, especially in cities with open data platforms. For cities lacking such portfolios, it would be equally insightful to understand why such crucial issues are absent from the Smart City visions in general and from projects in particular.

#### 7.1.2. Focus

Insights from the review indicate that some of the Smart City initiatives are aligned to the problems facing their respective cities. For example, London, Milton Keynes and Glasgow all seem concerned about the carbon footprint of last mile fleets in city centres. Smart City initiatives, including banning vehicles that use fuel as well as the testing and demonstration

of electric and autonomous vehicles, are being used to address present and future city challenges. Glasgow's Intelligent Street Lighting, walking app and City Energy Model's intelligent retrofit scheme all form part of the city's attempts to promote a walking culture and improve housing conditions, as well as to address some of the city's crime problems. The Food Passport in Milton Keynes and the Community Gardens were orientated toward the promotion of locally produced food, and for preparing for environmental hazards such as flooding, respectively.

Notwithstanding these examples, it is also true that there are very limited Smart City initiatives that aim to address other structural problems such as inequality, poverty, housing shortages or homelessness, as experienced in most major cities in the UK. It is not immediately obvious why they pay little attention to structural and more endemic problems. One plausible view is that leaders of these Smart City initiatives do not engage with truly segmented and representative stakeholder groups (The British Standard Institution, 2014) and therefore do not appreciate the complete breadth of problems that their cities face. A recent empirical study found that, of the 187 senior management from councils across England, Scotland, Wales and Northern Ireland, around 80% have no team or individual responsible for Smart City development or delivery (DJS Research, 2016). It would be useful to find out from funders, city authorities and smart city project partners why there are few initiatives focused on addressing the more structural and endemic problems faced by cities across the UK.

### 7.1.3. Defining a Smart City

As mentioned in Section 3.2, smart cities comprise different components (Manville et al., 2012). However, as Manville et al. (2012) rightly pointed out, most Smart City initiatives focus primarily on smart environments and smart mobility. This is partly because climate change is considered to be one biggest global challenges at present with adverse consequences for different aspects of urban life. Other aspects of Smart City life, such as smart people, the smart economy and smart living have not received as much attention. This leads us to question whether a city needs to pursue Smart City initiatives that give proportionate attention to a more diverse range of Smart City issues before it can be correctly classified as such, or whether a city automatically earns the right to call itself a Smart City if it uses data and innovations in digital technologies to solve its most pressing challenge, even if this is to the exclusion of its other challenges.

## 7.2. Stakeholder engagement

### 7.2.1. Stakeholder engagement plans

All four case study projects emphasised, in one way or another, the centrality of stakeholders in the success of their Smart City initiatives. Some (e.g. Milton Keynes, Glasgow) include stakeholder engagement as one of the pillars or work streams in the Smart City plans. However, from the secondary data accessed, it is unclear as to whether any of the case studies have a separate stakeholder engagement plan that outlines not only the strategies used to collect data from stakeholders, but also how the data collected are going to be translated into initiatives which stakeholders can easily identify (Department of Environment Land Water and Planning, 2015). Such engagement plans detail plans and infrastructure to facilitate ongoing engagement as the projects progress. Where relevant documentation exists, it is imperative that the case study cities publish it, just as the Sidewalk Toronto project has done.

### 7.2.2. Citizen-led initiatives

Smart City initiatives are generally criticised for not engaging stakeholders, or more specifically, for not engaging with citizens at the product or service design stage but rather at the user stage where they have little or no influence over what is done and how it was done (Cardullo & Kitchin, 2019; Future Cities Catapult, 2016; Gooch, Wolff, Kortuem, & Brown, 2015).

The insights from the Smart City case studies present a different picture and suggest that not all Smart City initiatives are top down. Manchester's Future Everything project brings together people from diverse backgrounds to question the future of technology through collaboration and play, and to further champion grassroots innovation, create new opportunities through art commissions, and advocate for citizens and communities in future digital culture through learning by doing and sharing best practices. Similarly, the OurMK platform in Milton Keynes allowed residents to pitch innovative ideas, receive funding and mentorship as part of the city's efforts to leverage on local knowledge to solve problems facing local communities. In Glasgow, hackathons focused on issues related to public safety, energy, health, and transportation over a four-week period across different parts of the city, as part of the Glasgow Future Cities programme. It was claimed that the hackathons brought together people from different backgrounds to share ideas, learn and innovate products and services.

Despite this, a careful reading of the case studies would suggest that some of the criticisms still hold true. It seems there are specific Smart City initiatives where there is no evidence of citizen involvement in the product and service design, but rather researchers from

universities and private businesses, mostly in technology and communications, are leading or driving the projects. Good examples of this include Manchester's CityVerve and Triangulum smart initiatives. While the City Council is silent on how ordinary residents were engaged in the design stages of the initiatives under these projects, the evidence points to the fact that researchers and their technical partners carried out the initiation, design and execution of the initiatives. Ordinary citizens who lacked such highly technical expertise seem unlikely to have been involved. Similar observations can be made regarding the integrated transport mobility demonstrator projects in Milton Keynes, where the Open University led most of the MK:Smart projects. Some scholars have suggested that there may be both organisational and citizen-side factors that determine the level and quality of co-design or co-productive forms of citizen engagement (Voorberg, Bekkers, & Tummers, 2015).

Reinforcing criticisms by Cardullo et al. (2019), Smart City initiatives such as hackathons are underpinned by co-productive objectives, and in most cases the broader themes around which smart products and services are developed are pre-determined either by the City Council or by the private companies who organise the events. This means that the participants have little room to bring forward ideas and solutions that fall outside the pre-determined themes. The hackathons held in Glasgow organised around the four themes come across a classic example. It could be argued that the £20,000 prize money was a further incentive for the participants to think and innovate 'within-the-box'.

Most of the citizen-led initiatives seem confined to the activities that are most closely aligned to activities carried out by community groups. These initiatives tend to be non-technical and are not usually what could be called the 'hard technical stuff', like using sensor data and algorithms to develop smart solutions. Aligning citizen-led initiatives under Smart City projects with activities of community groups may be seen as a strategic approach to garner buy-in from local residents, but it should be questioned as to why only so-called 'non-technical' initiatives tend to be citizen-led.

The above observations prompt the following questions for empirical research:

1. Following Voorberg et al. (2015), it would be useful to understand why city authorities, scientists in universities, and private business who lead the so-called highly technical Smart City projects seem less inclined to involve ordinary citizens in the idea generation, development and execution stages of Smart City initiatives. This should be compared against residents' willingness and capabilities to take part in such technical exercises;



2. If local residents best understand local problems, then it would be useful to investigate the possibility of organising hackathons without pre-determined themes for participants to work towards.

#### 7.2.3. Post-implementation success

There is no shortage of evidence that city authorities and project leads of Smart City initiatives precede their project with crowdsourcing insights from residents on local problems. However, none of the case study cities provides any comprehensive or robust evidence on residents' perspectives regarding the implemented Smart City initiatives, their delivery process, their overall usefulness, or whether they reflect and address the concerns articulated. While it may be reasonable to argue that most of the Smart City initiatives in the case study cities and indeed across the UK are still demonstrators and are yet to be scaled up (Future Cities Catapult, 2016), there is still the need for some preliminary evidence on citizen attitudes towards such Smart City initiatives. In Dublin, Acheampong and Cugurullo (2019) have already conducted empirical research capturing the behavioural determinants behind the adoption of autonomous vehicles using data from over 600 residents: such evidence is needed to quickly address legitimate concerns that residents may have with a particular Smart City project before investors make irreversible commitments.

## 8. Suggestions for effective stakeholder engagement in Smart City Projects

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### 8.1. Prepare a stakeholder engagement plan

Stakeholder engagement is not an event but a process that continues even after a smart project has been executed. City authorities, project partners and project leads should ensure that they put together a stakeholder engagement plan and make it publicly accessible across different formats. Among other things, the plan should outline all forms of stakeholder engagement, both generic and those that are bespoke to specific projects. The plan should also make clear where the engagement would take place, who can get involved and how, what participation will entail, what capacities, if any, will be required. Output from the engagements, including ideas and physical initiatives, should be presented in accessible formats that are comprehensible to the stakeholders, and this should also be clearly set out in the plan.

### 8.2. Demonstrate transparency and responsibility regarding stewardship over public data

It is abundantly clear that Smart Cities thrive on massive amounts of data collected through voluntary data sharing by individuals, businesses and institutions or through unconsented and less conspicuous technologies like sensors affixed to city assets. Furthermore, the commercialisation and sale of public data to third parties by tech giants has raised public concerns about the ethics, governance and use of public data. These are legitimate concerns and need urgent, transparent and responsible responses.

The establishment of roles such as Chief Data Officer is a welcome development but the public need assurances that their data are not being used for purposes they have not consented to. It is imperative that guidelines and standards are jointly developed with the public regarding the collection, use, storage and disposal of their data. In the case of Sidewalk Toronto, a local charity crowdsourced questions from local residents on issues such as data governance, intellectual property and the business model of the project through an open, online document<sup>53</sup>. These insights were presented to the Toronto Sidewalk team during public consultation. Consequently, the project has now set up an Urban Data Trust, which is an independent, government-sanctioned entity to manage urban data and establish transparent processes for approving the use or collection of urban data. However, in spite of this intervention, the Information and Privacy Commissioner of Toronto is cited as having

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<sup>53</sup> <https://docs.google.com/document/d/1mD-jG5j3XWNoxiC1ZW6W7pcl5PI71HVBqzfTg2H67eQ/edit#>

concerns that the 'the absence of legislative framework to protect privacy and access, ensure best practice and provide independent oversight, makes the setting up of Urban Data Trust inadequate.'<sup>54</sup> This goes to show how crucial the issues surrounding data of all forms are to the public and that it is imperative that Smart Cities in the UK clarify where they stand in relation to them.

### 8.3. Develop an understanding of both organisational and stakeholder side constraints likely to undermine co-productive forms of stakeholder engagement

Smart City initiatives may be necessarily technical, but this is no justification for excluding those stakeholders who may be considered to be non-technical. Some stakeholders, particularly ordinary residents, have profound knowledge about their local circumstances and often have ideas that are likely to gain local ownership and hence sustainability. Leaders of Smart City projects need to comprehensively examine their biases, culture, work processes and physical infrastructure, as these, among other things, can enable or hinder efforts to engage with non-technical stakeholders much earlier in the life-cycle of a Smart City project. In line with this, there needs to be an understanding of both the circumstances and perceptions of non-technical stakeholders regarding their capacity to participate in co-productive forms of stakeholder engagements. This way we better understand what prevents Smart City project leads from adopting co-design and co-productive forms of stakeholder engagement on the one hand and how we can encourage non-technical stakeholders to express interest in the technical aspects of Smart City initiatives, especially at the design stages.

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<sup>54</sup> <https://www.thestar.com/news/gta/2019/09/26/sidewalk-labs-urban-data-trust-is-problematic-says-ontario-privacy-commissioner.html> (Accessed 19 February 2020)

## 9. Conclusion

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The purpose of this report was to review and present evidence of stakeholder engagement in Smart City projects across the UK following concerns that most Smart City projects are implemented in a top-down approach and the term stakeholder engagement has become a leitmotif without any evidence of impact. This report reviewed Smart City initiatives in four UK cities: London, Manchester, Milton Keynes and Glasgow, all of which have featured prominently in reports on UK and European Smart Cities.

Unlike other reviews that dive directly into the strategies and specific Smart City initiatives in each city, this report highlights some of the problems facing the respective cities in order to help determine whether Smart Cities projects are pursued purely to demonstrate the power of technology or whether they are intended to address current structural challenges faced by cities. Uniquely, the report also reviewed the forms of stakeholder engagement carried out under the respective projects to ascertain whether or not they respond to calls for stakeholder engagement forms that are more co-designed or co-productive in orientation. Regarding the extent to which the Smart City initiatives implemented are oriented towards challenges facing the case study cities, the report found some alignment between city problems and Smart City initiatives. However, most of the Smart City initiatives do not tackle more structural and endemic problems such as poverty, housing affordability and homelessness facing almost all UK cities.

The research also found that, while the Smart City visions in all the case studies highlight the importance of a bottom-up approach to better understanding the city and finding solutions that address existing problems, not all have committed to engaging with stakeholders at the initial stages of the Smart City initiative, nor have they allowed ordinary residents to propose, develop and implement initiatives that have the potential to solve local problems. Furthermore, the report showed that city authorities and their partners were often silent about very crucial issues, notably the ethics, collection, use, storage and disposal of the growing swathes of data being harvested. It is recommended that city authorities and their project partners develop and publish a stakeholder engagement plan, demonstrate transparency and responsibility in managing public data and explore ways of moving stakeholder engagement towards co-design and co-production formats. It is only in doing so that they will demonstrate a definitive commitment to stakeholder engagement.

## 10. References

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Acheampong, R. A., & Cugurullo, F. (2019). Capturing the behavioural determinants behind the adoption of autonomous vehicles: Conceptual frameworks and measurement models to predict public transport, sharing and ownership trends of self-driving cars. *Transportation Research Part F: Traffic Psychology and Behaviour*, 62, 349–375.

<https://doi.org/10.1016/j.trf.2019.01.009>

Ash, L. (2014). Why is Glasgow the UK's sickest City? *BBC News*. Retrieved from <https://www.bbc.co.uk/news/magazine-27309446>

Bliss, L. (2018, September 7). *How smart should a city be? Toronto is finding out*. Retrieved from <https://www.citylab.com/design/2018/09/how-smart-should-a-city-be-toronto-is-finding-out/569116/>

Caprotti, F., Cowley, R., Flynn, A., Joss, S., & Yu, L. (2016). *Smart Eco Cities*. Retrieved from <http://www.smart-eco-cities.org/wp-content/uploads/2016/08/Smart-Eco-Cities-in-the-UK-2016.pdf>

Cardullo, P., & Kitchin, R. (2019). Being a 'citizen' in the smart city: up and down the scaffold of smart citizen participation in Dublin, Ireland. *GeoJournal*, 84(1), 1–13.

<https://doi.org/10.1007/s10708-018-9845-8>

Cathelat, B. (2019). *Smart Cities, Shaping the Society of 2030*. Paris, France: UNESCO.

Cowley, R., Joss, S., & Dayot, Y. (2018). The smart city and its publics: insights from across six UK cities. *Urban Research and Practice*, 11(1), 53–77.

<https://doi.org/10.1080/17535069.2017.1293150>

Davies, S. (2014, June 3). Glasgow aims to be first "smart city." *Financial Times*. Retrieved from <https://www.ft.com/content/d119ac06-e57e-11e3-a7f5-00144feabdc0>

Deloitte (2015). *Smart Cities*. Pp. 113–117. Deloitte Netherlands.

Department of Environment Land Water and Planning (2015). *Effective Engagement: Building Relationships with Community and Other Stakeholders. The Engagement Planning Workbook: Book 2* (p. 134). p. 134. Victoria: The State of Victoria Department of Environment, Land, Water & Planning 2015.

DJS Research (2016). *Our enlightened future: the journey to smarter cities*. Sowerby.

Future Cities Catapult. (2016). Smart City Demonstrators: A global review of challenges and lessons learned.

Future City Glasgow (2015). *Open Glasgow End Stage Report*. Retrieved from [http://futurecity.glasgow.gov.uk/reports/FC\\_Reports\\_2015\\_CDH\\_V3.pdf](http://futurecity.glasgow.gov.uk/reports/FC_Reports_2015_CDH_V3.pdf)

Glaeser, E. (2011). *Triumph of the City: How our greatest invention makes us richer, smarter, greener, healthier and happier*. London: Macmillan.

Gooch, D., Wolff, A., Kortuem, G., & Brown, R. (2015). Reimagining the role of citizens in smart city projects. 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2015 ACM International Symposium on Wearable Computers, 1587–1594. <https://doi.org/10.1145/2800835.2801622>

GOV.UK (2018). Regional ethnic diversity. Retrieved February 4, 2020, from <https://www.ethnicity-facts-figures.service.gov.uk/uk-population-by-ethnicity/national-and-regional-populations/regional-ethnic-diversity/latest>

Government Office for Science (2016). Future of Cities: An Overview of the Evidence. In *European Metropolitan Growth Area 2027*. Retrieved from [www.cegd.eu](http://www.cegd.eu)

Greater London Authority (2013). *Smart London Plan: Using the creative power of new technologies to serve London and Improve Londoner's lives*.

Greater London Authority (2016). *The future of smart - Update report of the Smart London Plan*. (March), 105.

Harvey, D. (2008). The Right to the City. *New Left Review*, 53(53), 23–40. <https://doi.org/10.1080/13604819608713449>

Kitchin, R. (2018). Data-driven urbanism. In R. Kitchin, T. P. Lauriault, & G. McArdle (Eds.), *Data and the City* (pp. 44–56). Abingdon: Routledge.

Kitchin, R., & McArdle, G. (2018). Urban data and city dashboards. In R. Kitchin, T. P. Lauriault, & G. McArdle (Eds.), *Data and the City* (pp. 111–126). Abingdon: Routledge.

Leydesdorff, L., & Deakin, M. (2010). The Triple Helix Model and the Meta-Stabilization of Urban Technologies in Smart Cities. *Physics and Society; Adaptation and Self-Organising System*. <https://doi.org/10.1016/j.futures.2015.10.003>

Manchester City Council (2015). *Manchester's State of the City Report*.

Manchester City Council (2019). *State of the City Report 2011*. Manchester.

Manville, C., Cochrane, G., Cave, J., Millard, J., Pederson, K. J., Thaarup, R. K., ... Kotternink, B. (2012). Mapping Smart Cities in the EU. In *European Union, Directorate General for Internal Policies*.

Milton Keynes City Council (2018). *MK Digital Strategy 2018 - 2025* (pp. 1–7). pp. 1–7. Milton Keynes: Milton Keynes City Council.

Milton Keynes Futures 2050 Commission (2016). *Making a Great City Greater - Milton Keynes Futures 2050 Commission Report*. Retrieved from <http://www.mkfutures2050.com/images/pdfs/reports/MK50-Futures-Report-1-FINAL-SP.PDF>

Prynn, J. (2019, July 9). London housing crises: One in six renters depressed about being trapped in rental accommodation. *Evening Standard: Homes & Property*. Retrieved from <https://www.homesandproperty.co.uk/property-news/renting/london-housing-crisis-one-in-six-renters-depressed-about-being-trapped-in-rental-accommodation-a131896.html>

Sassen, S. (2015, November 24). Who owns our cities – and why this urban takeover should concern us all. *The Guardian*. Retrieved from <https://www.theguardian.com/cities/2015/nov/24/who-owns-our-cities-and-why-this-urban-takeover-should-concern-us-all>

Scassa, T. (2018). Crime data and analytics: Accounting for crime in the city. In R. Kitchin, T. P. Lauriault, & G. McArdle (Eds.), *Data and the City* (pp. 59–71). Abingdon: Routledge.

Shipton, D., & Whyte, B. (2011). *Mental Health in Focus: a profile of health and wellbeing in Greater Glasgow & Clyde*.

Stein, S. (2019). *Capital City: Gentrification and the Real Estate City*. London: Verso.

Thatcher, J., & Dalton, C. (2018). Data provenance the possibility: Thoughts towards a provenance schema for urban data. In R. Kitchin, T. P. Lauriault, & G. McArdle (Eds.), *Data and the City* (pp. 72–84). Abingdon: Routledge.

The British Standards Institution (2014). *Smart city framework - Guide to establishing strategies for smart cities and communities*. London.

The Manchester Partnership (2006). *The Manchester Way*. Retrieved from [http://www.manchestercommunitycentral.org/sites/manchestercommunitycentral.co.uk/files/THE\\_MANCHESTER\\_WAY\\_FINAL\\_0.pdf](http://www.manchestercommunitycentral.org/sites/manchestercommunitycentral.co.uk/files/THE_MANCHESTER_WAY_FINAL_0.pdf)

Voorberg, W. H., Bekkers, V. J. J. M., & Tummers, L. G. (2015). A Systematic Review of Co-Creation and Co-Production: Embarking on the social innovation journey. *Public Management Review*, 17(9), 1333–1357. <https://doi.org/10.1080/14719037.2014.930505>

Wolff, A., Kortuem, G., & Caverio, J. (2015). Urban Data in the primary classroom: bringing data literacy to the UK curriculum. *Data Literacy Workshop*. Retrieved from [http://oro.open.ac.uk/43855/%5Chttp://oro.open.ac.uk/43855/1/webSci - CR.pdf](http://oro.open.ac.uk/43855/%5Chttp://oro.open.ac.uk/43855/1/webSci-CR.pdf)

Woods, E., Labastida, R. R., Chow, T., Citron, R., & Leuschner, P. (2017). *UK Smart Cities Index 2017 Assessment of Strategy and Execution for the UK 's Leading Smart Cities*. (October), 79. Retrieved from <https://www.navigantresearch.com/reports/uk-smart-cities-index-2017>

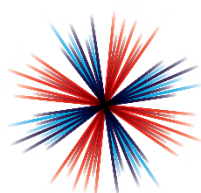




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