



Ipsos MORI
Social Research Institute

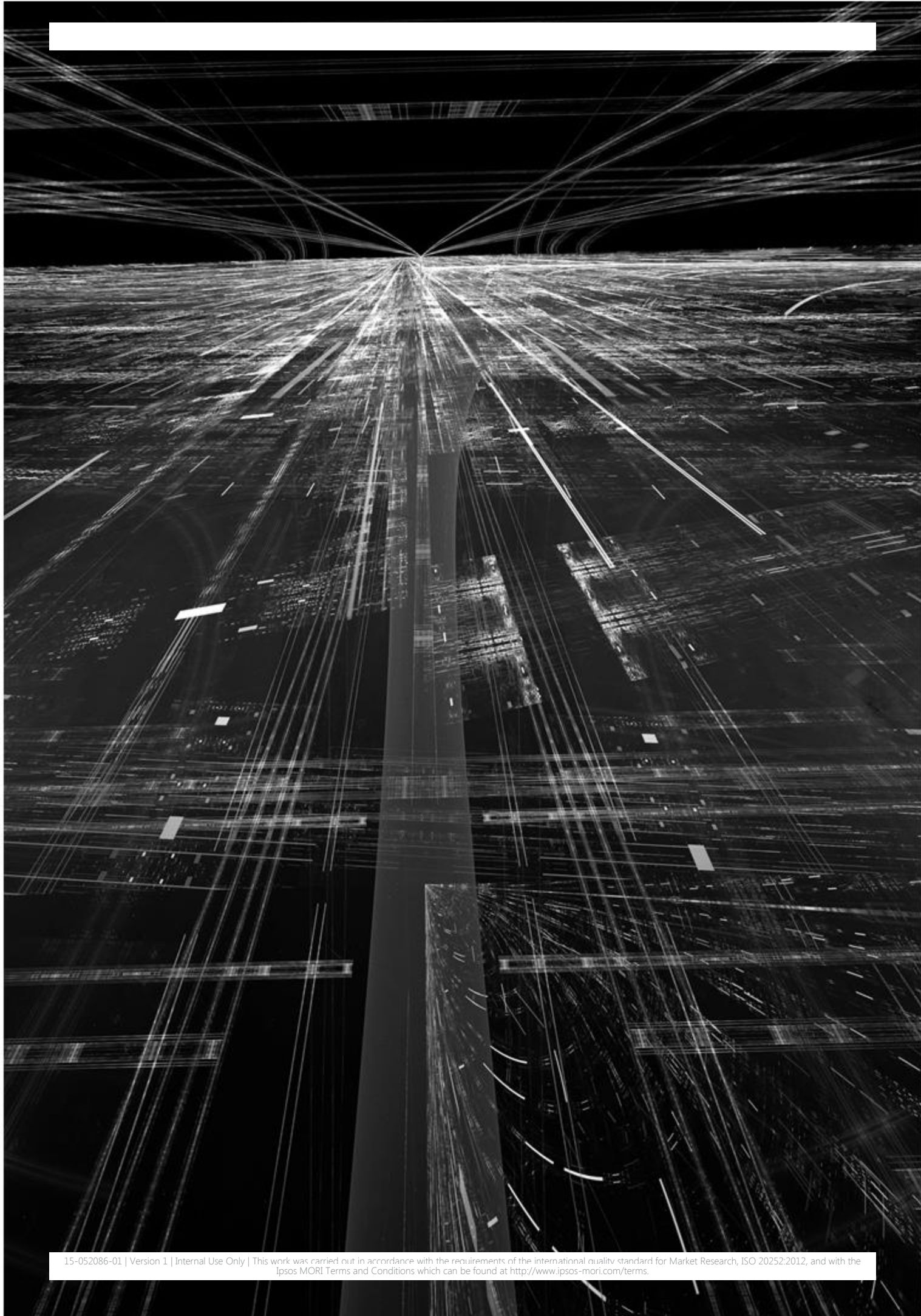


Innovate UK

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Future Cities Dialogue

Report for Innovate UK and Sciencewise



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Executive Summary

Executive Summary

Background, objectives and methodology

Innovate UK's Infrastructure Systems team commissioned Ipsos MORI to conduct this Future Cities Dialogue as part of their broader work on future systems integration and the market opportunities this generates.

The citizen dialogue element of the project aimed to provide citizen feedback on possible future urban scenarios and system integration options. To achieve this, Ipsos MORI carried out online and offline dialogue with citizens. This included three face to face day-long public dialogue workshops with 73 participants in total in London, Glasgow and York which focused on possible future outcomes of six urban systems to understand citizen preferences. All participants were then invited to a central reconvened summit held in London where we presented integrated future scenarios, and the technologies and innovation within them. All of these events were attended by experts in either futures, urban integration or the specific systems discussed, who engaged in dialogue with the participants. Before and after the summit, we ran an online community including all workshop participants, and 350 members of the public. Community members took part in a range of activities similar to those used in the workshops, covering system outcomes, integrated scenarios, and technologies, as well as their future hopes for the UK's cities. The workshops and online community were preceded by systems workshops with experts, led by Forum for the Future, which generated detailed discussion of each system and outlines for the outcomes that were discussed with the public.

What do the public want from future urban systems integration?

Equality emerged as the most important principle underlying the future cities participants want us to have. Across all of the urban systems included in the research, participants wanted services that cater for all citizens and wanted to see technology and integration that supported that. Thus citizens see the opportunity for the private sector to drive innovation, but did not feel that system integration should be entirely in the hands of the private sector amid fears that poorer citizens would not have access to it. Participants also rejected future cities that resulted in large inequalities between cities, as well as between the communities within them. They felt that integration should therefore happen in a way that builds on, or allows for, the links between cities and different communities.

Participants also wanted to **avoid a de-skilling by technology**. They frequently recognised the benefits technology can bring, including facilitating integration and making our lives easier. However, there were also concerns that important skills would be lost and heritage products, relying on traditional skills, would suffer. Furthermore, some participants expressed concerns that 'smart' technology could also 'make us dumb' and result in a far less interesting life, through removing choice from some activities, like what to eat, and making others redundant, like driving. Participants' concerns that skills could be lost, were lessened if it was felt they were being replaced by other skills that had 'value'.

This citizen dialogue raised that there is a trade-off for participants between **localism and government oversight**. In principle they were keen to have more involvement in running systems and services in their community, as they believed this would empower citizens, giving them greater buy in to the services they receive. For systems like energy and water, participants also felt this would give them a closer connection to the system and encourage citizens to be more resource efficient. However, they were concerned that communities may not self-regulate, or that some services like healthcare would be

better suited to being centrally run. Thus there was a feeling there was a need for some government oversight, despite expressing distrust of government.

Integration opportunities were popular where they sparked **grass roots innovation**. 'Innovation hubs' and energy gardens were popular ways of building innovation, in a way that helps the local community that drives it, and brings the community together. Participants also supported integration ideas that nurture the community's skills and heritage. However, participants also called for innovation that encourages sharing of resources - such as natural resources and local skills - to allow the areas of the country lacking in these resources or assets to flourish.

Citizens wanted to see **technology that supports social interaction**. As technology progresses, more and more interaction takes place online, often increasing access to services and making delivery of them more efficient. While this increased efficiency was welcomed, many did not want to see a world where online interaction suffocates more traditional ways of communicating and interacting. Participants valued face to face interaction above online interaction, seeing it as deeper and more sociable, as well as being more effective for some aspects of healthcare in particular. Remote access to healthcare was one area where participants saw benefits in it for more routine care but feared that it would be less suitable for the elderly or vulnerable who would require more traditional ways to receive their care.

Systems integration will inevitably make use of new and advanced forms of technology. Participants were keen for this **technology not to be obtrusive**. They recognised the benefits of smart devices such as smart fridges which could order food or heating systems reminding to turn the heating down, but wanted to have the freedom to ignore them, rather than feel such devices were dictating their lives. Similarly, they feared technology like drones could also become too dominant and questioned what kind of regulation would be required to prevent this from happening. Thus, while technology was broadly supported, participants wanted it to be used within certain boundaries to protect their freedoms.

As part of this inherent technological advancement, systems integration is also inextricably linked with greater **sharing of data**. Whilst the benefits of data sharing were well understood, for example in being able to deliver more targeted services, citizens again wanted there to be limits. For example, they were concerned about data getting into the hands of private companies by stealth. Participants were not against private companies accessing personal data in principle but believed there needed to be **clarity around data ownership, and transparency** on the implications of giving access to your personal data. There were also concerns about **data security**, with participants seeking reassurances that their data would be safe and not vulnerable to hacking or mismanagement of data.

Many citizens felt that systems integration should take account of **sustainability and resource efficiency**. Citizens preferred integrated scenarios that were less dependent on fossil fuels, and supported expanding the renewable sector and switching to alternative fuels or utilising technology to reduce inefficient resource use. Examples of system integration that demonstrated resource efficiency were also popular, for example waste being integrated with energy and transport.

Systems integration often seemed to citizens to be focused on productive ends, such as delivering more efficient services. Nevertheless, they wanted **integration that works in synergy with the arts and culture**, even if the economic benefits are less obvious. Participants saw these activities as vital to quality of life, and believed they provided opportunities to deliver more rounded integration that would be more well received by citizens.

The findings of this dialogue show that participants support the idea of the different systems within our cities becoming more integrated and the benefits that this could bring for citizens. They are interested in the process of how our cities encourage and make use of innovation, and there is an appetite for them to be involved in it to ensure the citizen voice is

at the centre of the process. However, this dialogue has also revealed that loss aversion is a powerful instinct that can prevent citizens from fully embracing the integration of systems. It will be critical for this loss aversion to be overcome if integration of our cities is to be implemented successfully, while meeting the needs of their citizens. For this to happen, it will be necessary to clearly articulate the opportunities that this integration provides to citizens, above and beyond the status quo, while also understanding what concerns and unanswered questions citizens may have.



Introduction

1. Introduction

1.1 Background

Innovate UK is the government innovation agency. It is focused on driving innovation in science and technology to enhance the British economy and increase productivity, and supports cross-sectoral collaborations that grow successful new business solutions.

The Infrastructure Systems team of innovate UK, is focused on growing the major global market opportunities that come from optimising transport and energy systems, and from integrating these with other systems such as health and digital in an urban context. By 2050 75% of the British population will be classified as urban citizens. With this brings a lot of challenges; overpopulation, congestion, supplying water and food, pollution, overheating and the shifting demographic of cities. The Infrastructure Systems team recognises that, in order for cities to be successful in the future, they need to:

- Provide a strong and growing economy for job prospects to be fruitful and trade to be vibrant;
- Enable excellent quality of life for their citizens, and;
- Reduce their environmental footprint and operate within sustainable limits.

The UK's cities are comprised of several separate but interconnected infrastructure systems, soft and hard, that help citizens travel, work, socialise, consume and live comfortable, healthy and sustainable lives. Innovate UK and the Infrastructure Systems team recognised that the challenges faced by the UK's cities could not be met through improving these current city systems in isolation, and in order for cities to meet their growing challenges, urban systems need to be integrated so that they work together better. To help achieve this the Infrastructure Systems team needed to know:

- Which city systems can be integrated?
- Where does integration lead to resilience, and where instability?
- What do citizens want from integrated systems?
- How does Innovate UK ensure that the competitions they run and the projects they back are heading towards the integrated urban future that people want?

The world-wide market for integration of urban living systems is estimated to be £200 billion pounds by the year 2030, and Innovate UK believes that British firms have the right skills and tools to take advantage of this opportunity. Together with helping firms drive innovation, Innovate UK wants to engage the citizens of British cities in their work, to have their say on which types of integration of systems works for them. This led to Innovate UK commissioning a research project to understand more about the opportunities for integration in UK cities and the expectations and preferences of the UK public towards how this can occur.

The research comprised of two strands; stakeholder and expert engagement to create and refine visions of future system integration in UK cities by the year 2040, conducted by Forum for the Future¹; and a citizen dialogue to understand what people want from their cities in 2040, conducted by Ipsos MORI. In this report we present the findings of the citizen dialogue.

The project was co-funded by Sciencewise, a programme set up by the department for Business, Innovation and skills (BIS) to improve Government policy making involving science and technology. Sciencewise aims to do this through encouraging the use of effective public dialogue to bring the public voice into the development of policy. Public dialogue brings together members of the public, policy makers, scientists and other expert stakeholders to deliberate, reflect and come to conclusions on national public policy issues.²

1.2 Research aims and objectives

The overall aims of this co-funded Innovate UK and Sciencewise research are:

1. To study the opportunities for integrated city systems, including future visions, citizen engagement and interdisciplinary stakeholder collaboration and co-creation.
2. To inform the development of the Infrastructure Systems team, especially the resulting competitions for funding, by providing citizen insights on possible future city scenarios.
3. To enable Innovate UK to learn about the practice of designing and delivering processes of public dialogue to generate useful conclusions for sustainably integrating city systems that reflect the public voice.
4. To provide Innovate UK with a clearer understanding of the opportunities and risks of system integration in urban areas and the citizen response to different options.

1.3 Methodology

In order to understand the public's preferences and opinions towards their future cities, Ipsos MORI conducted a citizen dialogue, comprising of two strands; public dialogue workshops and an online community.

Public dialogues allow for members of the public, sector experts, and public policy makers to contemplate and discuss complex issues. Due to the complex matters often being discussed, this method benefits from taking viewpoints from different people, with different backgrounds and knowledge, enabling a holistic approach to answer research questions.

Inception workshop and Advisory Group

The project began with an inception workshop attended by Ipsos MORI, Innovate UK, Forum for the Future and Sciencewise (referred to in this report as the Steering Group) to agree the urban systems the research should explore, the research

¹ Forum for the future is an independent non-profit organisation that works to support businesses in their sustainability challenges. Their aim is to promote the transformation and integration of key systems in order to help create a sustainable future.

² www.sciencewise-erc.org.uk

design, and to agree the advisory group composition. The Steering Group selected water, health, food, transport, waste, and energy as the systems to be included in the research.

Prior to the workshops and dialogues, an advisory group was formed to advise on the research process as a whole and in particular to:

- Ensure that the research process was far reaching, accessible, and targeted at all relevant stakeholder groups.
- Ensure the dialogue material was comprehensive, balanced and accessible.
- Comment on the stimulus material to be used in the citizen workshops
- Participate in the public dialogue workshops.

The advisory group members included those listed in Figure 1.

Figure 1: Future Cities Dialogue Advisory Group

Name	Organisation
Adrian Slatcher	Manchester City Council
Alexandra Paget	Demos
Caroline Twigg	Future Cities
Ellie Cosgrave	UCL
Joe Manning	New Local Government Network
Eleri Jones	Government Office for Science
Richard Miller	Innovate UK
Steve Turner	Manchester City Council
Roger Savage	Atkins Global
Geoff Snelson	Milton Keynes City Council
Scott Smith	Changeist

Expert workshops and interviews

Forum for the Future led a series of expert interviews and workshops to map possible future trajectories of city systems in 2040, explore opportunities for system integration, and produce stimulus material to be used in the citizen dialogue. Six day-long workshops were held, each dedicated to one of the six systems. 15 to 25 experts in each system, from the private sector, government and academics, attended each workshop. They discussed and developed feasible future outcomes for each city system, to the best of their expert knowledge which were refined by Forum for the Future into three to four coherent and distinct outcomes per system (listed in Figure 2). These system outcomes are described in more detail in Chapter 2 of this report.

Figure 2: System outcomes created to use in the public dialogue workshops

	Outcomes			
Energy	Big Power	Intercity Trading	Renewable Communities	
Food	High Tech & Functional	High Tech Globalised Supply	Government Keeps Me Healthy	Pulling Together Locally
Healthcare	Open Data Platforms	Remote Healthcare	Targeted Healthcare	Private Dominates
Waste	Patching Things Up	Repurposing	Sorting Things Out	
Water	Community Patrol	Smart Water	Regulated Water	
Transport	Me Mobility	Two-Tier Town	Regional Renaissance	Carpool

Citizen dialogue fieldwork

1.3.4.1 Face to face citizen dialogue workshops

Ipsos MORI held Citizen dialogue workshops in three cities in the UK as described in Figure 3.

Figure 3: Workshop design

Location	Date	Number of participants	Rationale for city selection
London	16 January	23	Two of the four British 'demonstrator cities'; cities which were awarded a grant by Innovate UK to showcase how they can integrate services not currently demonstrated by British cities. Glasgow was awarded £24 million, and London £3 million
Glasgow	23 January	26	
York	23 January	24	Provided different characteristics from the demonstrator cities. Is a much smaller city and has been involved in bids to devolve power from central government to the local authority.

Due to the complexity of the topic, the workshops lasted for 6 hours (10 a.m. - 4 p.m.) which provided sufficient time to cover all materials, whilst minimising the risk of respondent fatigue.

We chose to have around 25 participants in each location because it was a manageable number for the plenary sessions, and also gave us the opportunity for the group to be split into 4 smaller breakout groups. We decided that six systems, with multiple outcomes per system (21 system outcomes in total), would be too many for each participant to consider in detail, so each breakout group covered three systems, and their views were combined and compared at the end of the day in a plenary session. The workshops were moderated by facilitators, using a discussion guide to help manage the discussion.

The discussion guide – presented in the appendices - summarised key exercises and probes to ask the participants, in order to make sure that the approach taken was consistent across groups and locations.

We divided the day into three main sections. The first part introduced the project, the aim of the day and the people and organisations involved in it. This was followed by a participant discussion of their city and their vision of how it might be in the future. The middle section covered the main part of the day and introduced the systems (3 systems for each breakout group) and their outcomes. Our aim was to understand what people wanted from each system in the future, what challenges each system posed, and what the benefits and drawbacks were of each system outcome. Lastly, in the plenary we brought together all breakout groups to discuss the main principles underlying participants' views, and to draw out the similarities and differences in their preferences. The findings of this stage of the research are presented in Chapter 2 of this report.

1.3.4.2 Reconvened citizen dialogue workshop

All seventy-three participants from the regional first round workshops were invited back to a final citizen summit in London to discuss how the systems could be integrated in future cities. These discussions were similar to the first events, but instead of looking at the six urban systems in isolation, they instead focused on integration opportunities. Three visions of future city integration were created by Forum for the Future from the outputs and preferences of the first round of citizen dialogue workshops. These scenario visions illustrated different ways in which infrastructure system integration might occur, with each scenario being given a title for ease of reference; *Repair and Share*; *Devolution Revolution*; and *High Tech High Choice*.³

This reconvened approach allowed the participants from each of the three different cities to gather and share their thoughts during the six-hour workshop. In total, 61 participants attended the reconvened workshop – 22 from Glasgow, 20 from London and 19 from York.

The day was structured similarly to the first events, starting with a plenary introduction to the day and a re-cap of the study and its purpose. The participants then broke into six groups, each one representing all three locations and spent most of the day discussing the three future city scenarios - what was and was not appealing about them, where opportunities of integration lay, what was acceptable in the scenarios, and whether they could see themselves in each of these worlds in the future.

Thirdly, we used 'technology cards' to initiate discussions around how particular technologies of interest fitted into the future scenarios and where opportunities existed for additional innovation or integration of technology across systems. As a final exercise, the breakout groups were asked to role play, considering each scenario as if they were either 'tax payers' (taking a financial focus), 'citizens' (taking an ethical focus) or 'individuals' (focusing on the needs of themselves and their families). We split up the groups for the first time so that each new group had a mix of individuals taking on each role. The final plenary rounded up the day and shared the ideas between the groups.

All stimulus materials used at the workshops are presented in the appendix.

³ After their analysis of citizen reactions to the scenarios, Forum for the Future used alternative terms to describe the scenarios in the final expert workshop and their final report - Market Newton (High Tech High Choice), Greater Harchester (Devolution Revolution) and Little Langbrook (Repair and Share). In this report we have retained the original names throughout to reflect the terminology that was used with participants.

Online community

Ipsos MORI created an online community to engage a wider section of the public and extend the research to cover different cities and regions of the country. The purpose of the online community was to reach a broader audience and open up the conversation to include residents of other cities, as well as smaller towns. It also offered opportunities for participants in the workshops to further elaborate on any views they expressed in the workshops or had reflected on since attending the workshops.

The online community brought together participants from the public dialogue workshops and 350 members of the general public recruited from Ipsos MORI's Online Access Panel. The workshop participants and online panel members completed similar but separate activities within the community. The panel members were recruited based on similar characteristics as the workshop participants; to provide a mix of urban and suburban residents, age and gender. The community launched a week before the final citizen workshop. It ran for four weeks so that the workshop participants could engage between the first events and the final citizen workshop, and following completion of the final citizen workshop. A mix of activities were run via the community, including forums and questionnaires:

Forums:

The main forum discussed the same ideas which were brought up in the first workshop: what excited them about the future for their city in 2040, what they thought might be better, what might be worse and what aspects of city life they wanted to remain the same.

A second forum asked participants to share thoughts on good and bad things that were happening in their cities today. Here participants often started new threads, such as discussing housing and Wi-Fi/internet services.

A third forum encouraged participants to share photos of their cities, or news stories that illustrated what has changed in their world over the past 25 years, and where the use of technology had been applied in a good way.

Three questionnaires were uploaded:

1. Community participants were shown a simplified version of the system outcomes and were asked to indicate which systems they found most and least appealing, and the reasons why.
2. The three integrated system scenarios were presented for comment: whether they could see this happening in their city, whether there were any gaps which technology could improve, what the most and least appealing aspects of each scenario were.
3. The technology cards from the final citizen workshop were shared to find out whether they liked or disliked these technologies and why, and which technologies were thought to have the most impact.

Recruitment of participants

Ipsos MORI's in-house recruitment teams managed the recruitment. The workshop participants were recruited on-street with all participants needing to meet the following criteria:

- UK resident

- Living in York/London/Glasgow, either in the city centre or suburbs (recruited from across a range of boroughs in London)

There were other quotas set on gender, age, working status, ethnicity, and socio-economic status to ensure that the sample of participants reflected a broad range of the city's population. Recruiters were also asked to select a variety of people from the inner parts of the city as well as from the suburbs, to explore their experiences of travelling in and out of the city centre for leisure and work. The full recruitment criteria, screener and quotas are included in the appendix.

All participants were given a cash incentive to attend the workshops and for participating in the online community. This helps provide a more balanced research sample and avoids only the most engaged people taking part. Payment of the incentive was phased so that a higher amount was given after the second workshop, to help reduce attrition between the workshops.

Limitations of the research

The aim of qualitative research, such as dialogue workshops, is to explore the underlying reasons why people hold certain beliefs and attitudes, not to draw any statistical inferences at a population level. Citizen dialogue is therefore useful when gathering information on complex topic like this, in order for us to understand why participants like or dislike a particular application of a technology or system outcome and their views on 'integration' of city systems.

It should be recognised that one cannot draw conclusions from the findings of public dialogue that will infer that the entire population, or citizens of one city, held a certain view. Thus, it is not possible to give a precise indicator of the occurrence of statements being made, due to the small number of participants involved in qualitative studies. However, throughout the report, we discuss to what extent and strength a feeling or perception was expressed by illustrating with "a few", "many", "some" etc. Despite not being able to draw any conclusions such as 'xxx are more likely to state xxx', it provides a tool for understanding the popularity of a feeling or thought expressed in the workshops. What qualitative data does provide, however, is a rich and detailed illustration of the viewpoints, feelings and perception of the participants involved. It also provides an understanding of why participants hold these views, and how they might change as different information and viewpoints are presented to them.

We use verbatim quotes throughout the presentation of findings to support a feeling or thought which was indicated often. Where verbatim comments are supporting a particular view, they are attributed to the city of the workshop participant making that comment. If comments from the online community members are used, they are attributed by 'online community participant'. No further information is given about the individual to protect anonymity of the participants.

As this research included collecting views from an online community, it should be noted that similar caveats and benefits are found using this methodology as face to face qualitative data. Despite having a higher number of participants engaging in the online community, no statistical inferences can be drawn, as the research sample was not designed to be representative of the UK population. Further, although moderators posed questions and posted probes (generally to the community members but also in response to posts by individuals), it is not possible to engage the entire community like a moderator would do in a workshop setting. Rather it is completely up to the participant how much they want to engage with a community activity.









The future of city systems

2. The future of city systems

Different outcomes of each urban system were generated from expert and stakeholder interviews and workshops. Each one illustrates a narrow but viable snapshot of the way each system (water, waste, food, energy, transport and health) could look like in UK cities by the year 2040. These outcomes were presented to participants to elicit views on the elements of each one that they found appealing, concerning and requiring additional information or explanation. The aim was to understand what citizens want to see from UK cities in 2040 and to provide insight to help create different scenarios of how UK cities might develop by the year 2040. The outcomes for each system are presented roughly in order of preference, based on the workshop discussions.

Overleaf we set out a summary of the citizen response to the outcomes presented for each system.

 <p>Energy</p>	<p>Participants favoured the Renewable Communities outcome, in part because they liked the idea of having the greater choice and responsibility that increased community involvement would bring. This vested interest in their own energy provision was perceived to encourage more efficient usage. The increased use of renewables was popular as they are more environmentally friendly. Participants generally did not want a future energy system which concentrated significant power and profit with large energy companies, thus Big Power was the least favoured. As we observed throughout the citizen dialogue, equality was a key consideration. Citizens were concerned that the energy system should provide affordable energy for all, and that regions with fewer energy resources to draw on should not be penalised.</p>
 <p>Food</p>	<p>There was less consensus with the food system. Some favoured High Tech Globalised Supply as it would allow consumers to enjoy food from around the world. This contrasted to those who felt that Pulling Together Locally would bring us closer to the origins of our food, and improve community cohesion. Many participants were concerned by the environmental and cultural impacts of the food system becoming too reliant on technology. While technology (such as 3D printing) was seen to provide benefits of cheaper and more convenient nutrition, this was outweighed by fears that the social and cultural aspect of cooking and eating would be lost. There was rejection of a future where food was for fuel only, or where the food we consume seemed too 'unnatural.'</p>
 <p>Health</p>	<p>There was an overwhelming sentiment that the NHS should be protected within, or at least be a prominent part of, the future health system. Many participants were strongly opposed to a future health system dominated by private provision, to the detriment of the NHS. The overriding concern behind this was a fear that healthcare would be only for those that could afford it. The favoured outcome was therefore Targeted Healthcare as it seemed to be the most equal, being free at the point of use. There was broad support for technologies that could make delivery of healthcare more efficient, such as drones or remote diagnostics. However, many participants wanted to preserve face to face interaction with professionals, especially for more serious conditions, or for the most vulnerable. Largely, participants recognised the benefits that data-sharing provides in helping to target healthcare and improve diagnoses. However, some expressed concerns about sharing their health data, due to questions of ownership of data, privacy, and also the fears that a 'data market' could become <i>too</i> open.</p>




 <p>Transport</p>	<p>Participants' favoured outcome was Regional Renaissance as it was seen to provide a high quality public transport system. Urban citizens see congestion as a significant problem (particularly so in London), so were generally supportive of ideas to reduce congestion and therefore welcomed investment in public transport. They thought good public transport should be available to all, not just those in city centres, or priced to exclude those on lower incomes. Therefore, outcomes that seemed unequal in this respect were not popular. Nevertheless, the personal freedom, flexibility and independence afforded by private transportation was the main factor preventing outright support for highly invested-in regional transport. This was a particular concern among disabled participants. There were some concerns about data sharing in more advanced models, and some participants were keen for a greener future. However, these issues were not as important as being able to get around quickly and cheaply.</p>
 <p>Water</p>	<p>The preferred water outcome was Smart Water as it embraced technology to facilitate reduced water use with minimal public effort. Water (along with energy) was generally the system that participants felt least actively engaged with, and therefore welcomed the use of technology to take these decisions out of their hands. The sole concerns were borne out of a fear that these technologies could fail. However, this was deemed to be preferable to regulating water use via strict community control, which some saw as 'Orwellian' and intrusive.</p>
 <p>Waste</p>	<p>Participants were keen for a less wasteful society in the future. All waste outcomes sought to achieve this in different ways, however the most popular was Patching things up. Participants recognised that currently goods that are still usable are thrown away, and supported a future where we place more value in resources. There was support for the pricing of goods to reflect their environmental costs. In principle, many liked the idea of designing products that would last for life but worried this might hinder innovation, and reduce choice in what we consume. This was seen to be a particular problem for poorer citizens who may not be able to afford the upfront costs of such products. Whilst participants did want to reduce their waste, they did not want this to be forced upon them by government, and resented the idea in Sorting things out of paying for the waste that we throw away.</p>

Detailed views of the different technologies present in each system outcome are covered in section 3.4.

2.1 Energy

The three different energy outcomes that were presented to participants are summarised below. A more detailed version of the outcomes is included in the appendices.

Figure 4: Summary of energy system outcomes

NAME		WHAT DOES THIS FUTURE LOOK LIKE?	HOW DO WE PAY FOR IT?
#1: Big power 	<p><i>I get my heat & power from a centralised system – large scale nuclear, gas, offshore wind, and new technologies for capturing and storing carbon from emissions. It's very expensive.</i></p>	<ul style="list-style-type: none"> • Energy prices are high despite public and (overseas) private investment. High prices keep the energy supply secure and make profits for investors. • Energy companies incentivize users to reduce the amount they use. • As well as the centralised system there are local community and private solutions like shared solar panels, wind turbines, heat pumps, and better storage batteries. • Some whole towns have gone 'off grid' – if more people do this, the government will have to raise prices again for the rest of us. 	<p>High taxes and high energy bills. Fuel poverty has increased in some regions of the UK as a result.</p>
#2: Intercity trading 	<p><i>My city generates energy locally for local people first, and trades the surplus.</i></p>	<ul style="list-style-type: none"> • Powerful cities generate and trade energy, using their regional strengths and resources. • This includes solar, tidal, wind, biomass, some experimental small-scale nuclear, and demand response and storage technology. District heating and cooling systems are used. • If I live in an 'energy rich' city I get free windfall power, if 'energy poor' I get some government emergency funding. • Cities trade energy with each other through the national grid. 	<p>People pay city sponsored energy companies (e.g. York Renewables Co). In some cities energy is affordable but in energy poor cities bills are high. The government subsidizes those who are 'energy poor.'</p>
#3: Renewable communities 	<p><i>I get my energy from an efficient community and neighbourhood scale system – I can choose to use very local renewable energy if I want to and I can also get involved in running the scheme myself if I want. I really trust it and the companies who run it.</i></p>	<ul style="list-style-type: none"> • New technology has helped local communities run their own local grids, although a basic national grid is maintained. • Our fridges, heating, entertainment systems communicate with the internet to allow flexible demand management e.g. you can pay less at lower peak times and you are rewarded if you use less energy • Investment has improved renewable technologies; anaerobic digestion and bio-gas, better batteries, so some cities are powered 100% by renewables • There are lots of different energy companies competing, giving us lots of choice. We can easily switch between them online. 	<p>Ourselves. There are no government subsidies for energy, but the range of providers and community schemes keep prices cheap.</p>

Renewable Communities

'Renewable Communities' was the most well received energy outcome across all three workshop locations and the online community. It was felt by many participants that this outcome would be transparent because citizens could have a role in managing their energy locally. This vested interest in their energy provision, combined with the use of smart appliances, was thought to help raise individuals' awareness of energy use, and provide the knowledge and incentive to reduce their energy usage or move to renewable forms of energy.

"Local energy for local people means more involvement of local people. Folks will be more inclined to try hard to maximise energy efficiency in their homes."

Online community participant

The community aspect of this energy outcome was also frequently highlighted as a positive element, with communities working together meaning that individuals have greater choice and responsibility in deciding how their energy is provided. This outcome was also thought to be fairer and more affordable than the other two outcomes, with strong competition between providers driving prices down.

“I like that it seems the most environmentally friendly and that there are rewards for lower energy consumption. I also like that it's easy to switch between energy companies and that prices will be low.”

Online community participant

While many positive aspects to ‘Renewable Communities’ were seen, some possibly negative consequences were also mentioned. The high cost of delivery of this version of the energy system (in developing and implementing new technology and the infrastructure that smart technology requires) was highlighted by a number of participants, both in terms of set up costs and the cost of maintenance. Some also saw a need for central or national oversight of the energy system, in terms of regulation of energy to ensure its safety, and because without some central oversight this outcome might be ‘messy’ in practice. A number of participants also highlighted that this outcome might be too reliant on technology, making us vulnerable to technology malfunctions or to cyber security threats.

Intercity Trading

A number of positive aspects of ‘intercity trading’ were seen by participants of both the workshops and the online community. It was thought that this way of harnessing and delivering energy might help to redistribute wealth and power out of London and across the country, making particular use of regional strengths. It was also thought that this might help to redistribute the population out of London, as residents would be attracted to other regions where prices were cheaper. The profits made regionally from energy production might also be put back into regional projects, again helping to make the economy less focused on London.

Some did however think that this outcome might cause friction between communities or could – rather than helping to redistribute wealth across the country – lead to greater inequality, with huge variation between energy rich and energy poor cities and regions.

“Can cause ‘poor energy’ places to suffer, heat and energy is quite important for us to survive therefore everyone should be given an equal chance to receive it.”

Online community participant

“I think we will have areas which generate, have good consumption of energy, and then areas that don’t, and then I think...you’ll have more negatives than positives.”

Dialogue participant, York

Big Power

Of the three energy outcomes, ‘Big Power’ was the least favoured across all three workshop locations and by online community participants. High costs associated with this outcome were the most prevalent reason given for disliking it and, linked to this, some thought that the burden of these costs would fall on individuals while private companies and investors would profit. One of the perceived consequences of this - fuel poverty - was also mentioned as a negative aspect of this energy system. A number of participants also mentioned nuclear waste which they had concerns about being part of the energy mix, and thought that this would be a particular problem with this outcome.

Participants were able to find some positives to this outcome, however. It was felt by some that a centralised system, with the government in charge, would help energy provision to be well-managed and ensure security of supply.





“People could never agree locally on how the energy was distributed and how any profit would be used. I would rather ensure a big company who has experience in creating and distributing power was in control to ensure uninterrupted supplies.”

Online community participant

2.2 Food

The four different food outcomes that were presented to participants are summarised below. A more detailed version of the outcomes is included in the appendices.

Figure 5: Summary of food system outcomes

Name	WHAT DOES THIS FUTURE LOOK LIKE?		HOW DO WE PAY FOR IT?
# 1: Government keeps me healthy 	<i>The government has taken charge to grow our food more efficiently in a centralized system as the world has been rocked by climate change.</i>	<ul style="list-style-type: none"> Because of climate change the government has taken control to keep our economy going and keep us all fed. We mass-produce nutritionally-fortified foods that ensure we all get a basic level of nutrition. All land that can be used to produce food is, both in the countryside and around cities – urban green space have gone as housing is prioritised We genetically modify plants and animals to get the right production levels. 	High taxes. People complained initially, but given the effects of climate change we don't have much choice. Prices for staple foods are kept down. We are charged for food waste, incentivising us to use everything
# 2: Pulling together locally 	<i>I collaborate with my community to grow much of our own food close to home.</i>	<ul style="list-style-type: none"> There are global economic, security and climate challenges, but community spirit is high. We grow sustainable traditional crops and eat organic, local, climate resistant and seasonal crops and livestock, importing much less than before High-tech tools like wireless sensors and drones remotely monitor water and fertiliser and how the crops are growing to help farm efficiently Community dining halls, recipe libraries and family growing plots are popular Sometimes food is rationed if the harvest is poor. 	Ourselves – there are few central government subsidies. Food prices are extremely volatile, so sometimes we can't afford the nutrition we'd like. Some communities barter food for energy.
# 3: High tech globalised supply 	<i>Food is mostly high tech, sold and distributed globally. I want good quality and authentic food, which I buy from around the world to get it.</i>	<ul style="list-style-type: none"> Heritage foods like Swiss chocolate, Scotch whisky, French cheeses are a massive global market. Small urban farms give us a taste of 'real food' and are a cool tourist attraction. Most food is produced intensively, focused on high yields from animals and crops. This can be environmentally damaging Big multinational businesses are important – the most successful ones have managed to develop strong, authentic local brands. Electric vehicles and dual-fuel ships bring us food from all around the world 	Ourselves. Food is not cheap, but large intensive global manufacturing keeps prices down.
# 4: High-tech & functional - 	<i>I want ready-made, speedy food, with good nutrition, and I have to pay a lot more for it. I 3D print my own food or have it delivered by drones.</i>	<ul style="list-style-type: none"> Large scale rural farmland is run using very precise agriculture techniques (e.g. wireless sensors and GM interventions that influence nutrient levels). Urban farming grows high value products on building roofs e.g. superfood greens, honey. Delivery drones bring our food, or we 3D print food using ingredients, flavoring mixes and recipes which means less waste. Supermarkets no longer exist...some people don't even have kitchens. A carbon tax increases the cost of e.g. beef and dairy, so scientists to have developed new alternatives (e.g. insects, soy). 	There's enough food around – but it's a lot more expensive than it was. High-priced businesses give us the right kinds of healthy foods, even if they are heavily processed.

High Tech Globalised Supply

This outcome was perceived to be the most 'rational' food system in which participants could see themselves living in 2040. Participants felt positive about the degree of choice in this outcome, particularly being able to enjoy food from different parts of the world, and having the freedom to choose a more expensive, luxurious version of an item (in contrast to 'Government Keeps Me Healthy' and 'Pulling Together Locally'). A few participants believed that, as humans, we will be naturally curious to try new things, particularly as the UK continues to become more diverse and interconnected with the rest of the world.

Many participants thought that this future was inevitable as the UK cannot produce enough food domestically to satisfy the population, whilst maintaining choice. Thus it was accepted as the future which would be the most natural progression from the present food system, whilst retaining strength in heritage and local products.

"I don't think you can contain it locally, it's not going to happen because it's, there's not enough land locally. You're going to always have to bring stuff in, and that's just the way it is, I don't think it's going to change."

Workshop participant - Glasgow

"Local heritage foods are retained which keeps cultural identity amongst the globalization of production. Greater efficiency and yields are good but damage to the environment not so, however to stop starving it is necessary."

Online community participant

However, some participants were more sceptical of this system, particularly in relation to citizens becoming more separated from their food and its origins. They believed the more we become disconnected from the origin of the produce we consume, the more we are ignoring its sustainability and ethical considerations, such as the plight of labour and animal welfare in the source countries.

"We're so separated from where we'd actually be getting the food like the people that don't get paid in a field somewhere and animals being treated horrendously but we don't, we wouldn't care because we don't have to see it"

Workshop participant - York

With all the positives of this future being perceived as a natural progression of the current food system, there were also negative trends identified, particularly in terms of the increased contribution to greenhouse gas emissions. Participants questioned the sustainability of the reliance on intense farming, and its consequences on the environment. Further, another criticism was that this food system would not support British agriculture, which was a key concern for participants across locations. In this food outcome small urban farms in the UK provide citizens with a 'real food' experience and had become a tourist attraction. However, despite this the outcome was not perceived as strengthening Britain's farming industry.

"Just to reiterate I think it's a danger that we're going into the realms of food making a bigger carbon footprint than it already makes if we go along this road. And it would be nice to see Britain put some of its industry back on the map even if it is just the food industry."

Workshop participant - London

Pulling Together Locally

In comparison to 'High Tech Globalised Supply', the ethos of 'Pulling Together Locally' was favoured by participants in York and London. People living in Glasgow were more evenly split; some really liked it because of the self-sufficiency and localism spirit which runs through the outcome, or they could not see it working at all given the Glasgow climate.

Due to an emphasis on social cohesion and being closer to what we produce, the outcome was seen as a positive shift from the situation today where many felt we are ignorant about our food and community spirit could be improved. Thus, this was seen as an opposite reality to the previous future, where we would be removed from what we produce and thus disconnected from the potential issues of animal welfare and intense labour misuse. Participants felt that this future would remove the barriers and middlemen to bring people closer to food production, which would make people less ignorant to

these issues. Because this outcome involved people working together, participants across all cities agreed that it would have positive knock-on effects on other parts of society, particularly in relation to social cohesion and social care.

“And it not just helps them to get a group working but it is really good for those people who are essentially very isolated in London. And there’s a lot of elderly people, people who need a lot of help who do need just a little of social support sometimes”

Workshop participant - London

Whilst people were positive of the potential benefits this outcome could have on local communities, there were also concerns over practicality. Participants enjoyed the contrast to what they perceived as today’s increasingly isolated society. However, in reality, participants, particularly in London, could not see some people coming together and working, due to both the busyness of working people in London, and the huge variety of different cultural groups.

“It would require a lot of involvement from the community and people are very tight with their time and they are very selfish with their time especially in London.”

Workshop participant - London

People living in Glasgow in particular had doubts over whether such a system could operate effectively there. They cited lack of land close to the city to devote to agriculture, climatic reasons, the risk of placing so much emphasis on a small number of local producers and loss of efficiencies of scale when producing at small and local level,

Further, some participants struggled to believe that communities would be able to exchange food when one community was having difficulties producing any, due to lack of an incentive to trade or practical challenges of doing so. Some participants felt that it had the potential to create a divide between communities, making prosperity very dependent on where people live and the resources available to them locally.

“What would the incentive be for a wealthy community which has a surplus of food to share it?”

Workshop participant - York

“Could you imagine the bureaucracy? Oh yes, I’ve got some spare electricity from my panels so I’ll pay you that for your veggies.”

Workshop participant - York

People viewed this as a volatile world, where if one year a community did not manage to get enough supplies, its citizens would suffer. In general, participants liked the idea of bringing people together to establish an increased sense of community but as discussions evolved, more participants could imagine the potential difficulties of forcing different people to work with each other, and the division between communities which this outcome could create.

Government Keeps Me Healthy

This food outcome was a popular second option for some, but was rarely the most favoured. In some cases, it was disliked due to its inclusion of GM foods and other perceived ‘unnatural’ features to food as well as citizens’ loss of control. Participants generally liked the idea of the government providing basic nutrition to everyone, which would diminish the

need for foodbanks and increase the basic level of nourishment in the UK. Further, it would increase the general health level across the country, as choice would be limited and people would be restricted to eat healthily.

“What it is good for I think is the people that are ultra-poor [...] it would help them to get a varied and balanced diet. If it's controlled by the government and it's done from nutritional values.”

Workshop participant - London

However, this outcome was seen by some as the future we inevitably have to face as the consequence of our past habits forces us to limit our choice. Many participants felt this was a realistic future, but agreed it would be duller due to the limited options, and therefore not one they would like to live in.

“With the way the population's growing and the amount of waste [...], somewhere somebody's got to say, [...] we can't afford to throw away as much as what we're eating, so let's ration it out, everybody gets the same and rich or poor this is your ration card like we used to do in the war.”

Workshop participant - York

Moreover, many of the participants – across all workshop locations - did not like the idea of what they considered to be manufactured or unnatural foods, and the lack of choice in what they could eat.

“No, I wouldn't be happy eating genetically modified everything, meat, food, vegetables and stuff. I don't think, there's studies that show that it's not 100% sure that it has no knock on effects later on.”

Workshop participant – London

Ultimately, while this outcome involved improved nutrition for those on the lowest incomes, it was not a favoured food outcome because of the loss of choice that citizens would have over their food and their nutrition being dictated by a nanny state.

High Tech and Functional

This food outcome was generally the least favoured across the three cities, but had a few supporters in each location, especially those who look for convenience in their food. The issue of genetically modified food was brought up as a negative, as in *'Government Keeps Me Healthy'*. Participants were even more uncomfortable with the technologies and precision tailored nutrition packages, and believed it would lead to a sterile, 'boring' society.

“It sounds a bit like wartime actually”

Workshop participant - London

Generally, participants recognised the benefits this food system could have for busy people, especially Londoners. However, participants tended to project this benefit on to others, and were more likely to see the attraction this might have for other people in society rather than themselves. Many could just not imagine eating the foods that would be produced in this outcome.

“Bad as it might sound this is something that in London might work and people might want. That's the sad thing about this. I don't agree with it.”

Workshop participant - London

3D printed food was rejected by many, largely because they could not understand how the technology would be applied, and felt that it would mean consumers were too distant from our food and its origins. In contrast to other systems, the use of technology in this instance was not seen as improving equality. Participants did not recognise that it might open access to a wider choice of foods to people, as low cost.

However, the most accentuated issue was that this outcome was seen as creating a world with increased loneliness and less social inclusion. In similar veins to other system outcomes which have a high focus on advances in technology, participants did not see this as a natural progression of technology happening over time, but saw it as a sudden, brutal change to our society. It was felt that this would lessen social interaction or at least 'valued' interaction.

“There's no social contact, everyone would just be sat there like a drone, you'd forget how to speak to people and there's too much technology.”

Workshop participant – York

Moreover, the deskilling of people (loss of cooking skills) worried participants, and there was overwhelming concern that the enjoyment of eating would be lost in a world where food has become predominantly functional.




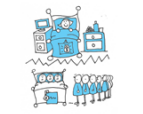
“There's such a culture around cooking and finding the ingredients and that's so fun every single day to cook and put your meal together and know what's going in it.”

Workshop participant - London

2.3 Health

The four different health outcomes that were presented to participants are summarised below. A more detailed version of the outcomes is included in the appendices.

Figure 6: Summary of health system outcomes

Name	WHAT DOES THIS FUTURE LOOK LIKE?		HOW DO WE PAY FOR IT?
#1: Open data platforms 	<p><i>There are many more healthcare providers to choose from, mostly private clinics and hospitals and new online services. I manage my health day to day with the help of technology, rather than waiting until I'm ill</i></p>	<ul style="list-style-type: none"> Open data platforms where users' health data is openly and freely shared in exchange for health services. These give us information about key health conditions, allowing for more effective, more tailored therapies – we lose some privacy in exchange for a better service DNA mappers map your DNA and tell you what health conditions you might be at risk of, what therapies might work best for you (e.g. if you should adopt a dairy-free diet). Jewellery and clothes contain sensors and connect to the internet to collect and exchange my health data. These are cheap and easy to use. Holistic health spas address my physical health and mental wellbeing; I can book a spa to take yoga classes or get treatment for illness. My taxes are lower: the NHS, as it was, is not there anymore 	<p>Ourselves – the market is dominated by private providers. But health services are affordable, because there are so many competing providers, and because the data we share with them makes it easy and cheap for them to deliver tailored services.</p>
#2: Remote healthcare 	<p><i>My healthcare is more automated and virtual. Instead of going to my GP, I wear a wireless device which collects and transmits health data, and I get medicine delivered by drone.</i></p>	<ul style="list-style-type: none"> We rely on good connectivity and data sharing. Remote analytics and diagnostics are used and drones and other robots deliver some services The NHS is there, but has outsourced many of its services to private subcontractors. There are fewer large hospitals, but they are more evenly spread across the country and more specialised e.g. in complex therapies like cancer care or surgical procedures – everything else is dealt with using remote care and local walk-ins Consumer health wearables, edible 'smart pills' which deliver treatment and monitor health signs are popular 	<p>Basic services are still provided by the NHS, free at the point of use and tax-funded. But many choose to pay for private services, which provide better, faster treatment</p>
#3: Targeted healthcare 	<p><i>A large NHS delivers highly targeted, efficient care. I pay more in tax, but have less choice in my treatment, as decisions about healthcare are made centrally for the benefit of everyone.</i></p>	<ul style="list-style-type: none"> The NHS is very aware of people's illnesses, health, lifestyle and fitness through constant computing and assessment. Wireless sensors placed on or in a person's body monitor health vitals and reports them back to the NHS, meaning individual healthcare can be targeted, and the NHS can predict disease patterns across the whole population. Drugs have improved and become more tailored e.g. eye implants to treat bad sight, or medicines tailored to your genes The health system is very effective at treating disease & our health is improving. The NHS retains firm control but subcontracts some services to private companies 	<p>Heavy taxation. People accept high taxes in exchange for their health being managed for them by the NHS.</p>
#4: Private dominates 	<p><i>A two-tiered system of public and private healthcare provision, depending on what you can afford.</i></p>	<ul style="list-style-type: none"> NHS is for the poor only. People who can afford it, either pay for private providers or move to cities which have better quality of life: clean air, public parks etc. People are increasingly obsessed with health – particularly now that many pay for their health services which focus on prevention instead of treatment Local governments are seen as just another service provider: we are willing to pay high taxes but only if we see benefits. People pay to improve their area, whether for a better clinic or improved policing. But some communities can't afford to do this, and cities have become unequal. Complex therapies like cancer care are provided by intensive care units which are much smaller – but better linked to other specialists than traditional hospitals. 	<p>Taxes pay for a bare-bones NHS which provides the basics to everyone, but not much else. The wealthy increase their access to health and wellbeing services by paying for private care.</p>

The discussions around the health system focused a lot on the current state of the NHS versus what it could be in the different future versions of the health system. The NHS was a big influencer for a lot of participants, particularly so given that the workshops were held during the junior doctor strikes and after considerable media coverage of the contract dispute. Another theme running through the discussions was participants' risk aversion and reluctance to change the NHS as an institution. This supports other Ipsos MORI health research which shows that eight in ten (78%) believe the NHS is one of the best health services in the world and more people believe it provides good value for money than was the case seven years ago.⁴⁴

⁴⁴ <https://www.ipsos-mori.com/researchpublications/publications/1747/Public-Perceptions-of-the-NHS-and-Social-Care-Survey.aspx>

The issues often focused around the most vulnerable in society, and how the healthcare outcomes would be created in order to build a more equal system for all.

Targeted Healthcare

Across the three cities, targeted healthcare was either the most, or the second most popular health outcome. The discussions often revolved around how healthcare in this scenario would cater for all members of society, whilst being free at the point of use. This also meant that most participants were fine with paying a higher level of tax, on the basis that all citizens would receive the same basic healthcare. Despite being accused of being a 'big brother society' where citizens lack personal choice, the outcome was liked due to the element of equality, which in contrast was often mentioned as the main negative aspect of the other outcomes.

"What I like about this idea is I like the NHS, I feel it levels the playing field, and it offers everybody a similar level of service."

Workshop participant - London

While the NHS was also present in 'Remote Healthcare', in that outcome it is delivered in a very different way, largely remotely, which was often cited as a concern.

Moreover, there were some participants who believed this system would benefit the UK society as a whole as it would lead to people putting more faith in the NHS to deliver the right kind of tailored treatments for them as patients, which would lead to a healthier society in general.

"And I think that there's the potential there for levels of controls to be put upon individuals to make them more compliant with what might be the requirements at that time, by state."

Workshop participant - Glasgow

Although this health outcome was in general the most popular in the workshops, and slightly the most popular in the online community (around a third voted this outcome as the most popular one), a few workshop participants took a different standpoint. They believed that if the state is too controlling, individual freedom would be compromised. Thus, whilst some believed that the targeted intervention would make the general population healthier, this was seen by some as compromising the individual's autonomy and choice in how they live his or her life.

"It's almost just like a sort of big brother state and [...] a little bit scary because it's almost as though you're a pet to the state rather, and you might lose your individuality"

Workshop participant - Glasgow

Despite the concern that this future would be a 'big brother state' others saw benefits in the sharing of data, as the NHS would have access to datasets allowing predictive analytics, which could help direct treatments proactively and in a targeted and more efficient way.

"I don't understand why you wouldn't share data. It sounds like being ill is a point of embarrassment."

Workshop participant - London

Remote Healthcare

The main positive aspect of this version of the health system, according to the workshop participants, was its cost effectiveness and relaxing the burden on the NHS and GPs. The increased usage of technology was seen as both having positives and negatives. The positives were that it could save time and be more efficient.

“Sending drones out to give them ongoing medication is not a bad thing. If they're medicated that in the first place, why would that person travel miles into town and then back again when they could just drone it out?”

Workshop participant - London

The perceived negatives were concerns about how this future would work practically for people with limited social networks, such as the elderly. Moreover, some participants found it difficult to visualise how some basic healthcare functions would work remotely.

“But what happens if he has to take your blood pressure?”

Workshop participant – Glasgow

Some participants mentioned that, because basic healthcare would still be provided by the NHS, this health system did provide a degree of fairness. However, in addition to potentially isolating older people some participants thought that it could exacerbate mental health issues as it was felt that such a system would not cater for this element of healthcare.

“I think the mental health thing would be a big issue actually in London. They wouldn't have the support of someone that you could go to and talk to.”

Workshop participant - London

Many participants believed that creating more virtual health diagnostics would save costs, and contribute to a leaner NHS. However, many also recognised that the loss of personal interaction was already occurring in many health appointments, particularly among GP visits, and felt this health outcome would further contribute to an increased loss of interaction.

“If you go to a GP it's like, I'm going to refer you here, there's the phone number for a self-referral, it's like, what did I come here for then?”

Workshop participant - Glasgow

In general, participants believed that the loss of personal interaction was too big a cost to accept this future as one they wanted to live in 2040. However, it has beneficial aspects, such as cost effectiveness, people having fewer minor health related issues due to wearables that track basic health, and was perceived as a good system for people with mobility issues.

Open Data Platforms

This outcome was rarely mentioned as the preferred outcome, but was also not the most disliked. What concerned participants about this outcome was what they felt was a lack of privacy due to their requirement to share data and the risk of it being hacked.

“There’s always going to be somebody who can find a way to hack into it. Because I don’t think there’s anything that can ever be hacker proof.”

Workshop participant - York

Whilst in ‘Targeted Healthcare’, sharing data was seen as positive because of the overall benefits to society, in this future it was less liked. The reason for this largely revolved around ownership of data and whether this provided a satisfactory service for everyone. Some feared that those on lower incomes would not be able to afford the technology required to monitor their health or that private providers would not see them as attractive enough to market their services to.

“Well yeah, it being a personal cost rather than on the government. It is going to be things like Apple watches are 400 quid a pop or whatever it is, I probably wouldn’t be able to invest in to be honest.”

Workshop participant – London

Moreover, many participants were less likely to support this data sharing aspect as the data would be shared with private companies, not the NHS.

“[I would share data] With the NHS but not, yeah, not the insurance companies”

Workshop participant – London

Additionally, participants wanted reassurances over who would have access to their personal data, and whether this might impact on insurance premiums.

“But with [...] some of these health insurance companies now [...] they’re getting to the point where you sign over your confidentiality where it will give them access through their own doctor or their own medical services to your private information and they’re going to start charging you more for your insurance.”

Workshop participant - London

Despite the fear of hacking, many participants could at the same time recognise the benefit of data sharing due to the opportunity to diagnose diseases early, and predict who would be most at risk of being affected.

“I think information sharing across companies is a good thing, because that would give you statistics as to maybe a group that you’re looking at, what illnesses could come from them, demographics, age group, so doing it like that, I think that’s a plus point on sharing data.”

Workshop participant - Glasgow

Participants did recognise that this would probably make the population healthy, and that we could have the potential to create interventions for people in need. Another positive feature of this outcome related to data sharing was that doctors would communicate with each other; the health records would be integrated so that they would speak to each other. This was an aspect of the health system which was seen as missing from the current health system.

Private Dominates

This outcome was the least preferred across all cities. Participants thought that it would create divisions where access to healthcare was based on income.

“Bad, bad, bad, bad. I disagree with the private healthcare of this generally. I think it’s OK if you could have some drugs that they can’t get on the NHS but I don’t think it’s OK to have this total division on the provider. Because all that’s going to happen, it’s going to cause a lot of social tension if it’s like that and people are going to resent each other and people aren’t going to mix together [...]”

- Workshop participant - York

It became clear that this outcome was the least liked among most participants due to lack of equality. Despite the NHS providing healthcare for the poor, many participants felt it would lead to greater inequalities in our society. Many participants across cities described this outcome as the world where they could imagine the poor being left behind with the most basic treatment, and the rich having the benefits of world-class treatments. Health was perceived as a basic need for everyone to have, but this outcome was not seen as providing a good standard for all in society:

“This is an apocalyptic world where the poor might get very, very angry about being left behind. And something like health, and it’s one of the basic things in life, isn’t it?”

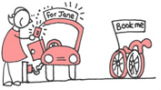



Workshop participant - London

The one thing that a few participants did pick up on as being good about this scenario was the focus on prevention, rather than treatment, as it could save money for NHS. However, when summing up the health outcomes, when asked what the most important thing they want in healthcare is, the answer was often equal healthcare, or the same healthcare being accessible to everyone, making this outcome unpopular.

2.4 Transport

The four different transport outcomes that were presented to participants are summarised below. A more detailed version of the outcomes is included in the appendices.

Figure 7: Summary of transport system outcomes

Name		WHAT DOES THIS FUTURE LOOK LIKE?	HOW DO WE PAY FOR IT?
#1: “Me mobility” 	<i>My neighbourhood provides everything I need. Most of my travelling is by foot or I book small electric cars and bikes online.</i>	<ul style="list-style-type: none"> We like personal space, so vehicle hire apps mean transport is available on-demand, with lots of choice of providers. I stay in my local area; working remotely and flexibly is encouraged, so no more rush-hour commuting. Mass transit like trains and buses remains, but more for inter-city travel. The road network is well-maintained, but we struggle with traffic as there are lots of personal vehicles. Air pollution less of an issue, as we use solar and electric-powered vehicles, and the batteries have improved. 	Digitally, using no cash. It's affordable and I get private transport when and where I want. I'm not prepared to squeeze onto public trains and buses. Taxes are lower because the government invests less in public transport, and there are more private providers.
#2: Two-tier town 	<i>City centres have well-run and integrated public transport but the suburbs are growing, and they have worse and more costly public transport.</i>	<ul style="list-style-type: none"> Mayors invest in city centre travel systems like buses and trams which are highly electrified, and automated. But those on lower incomes can't afford to live in the city and forced to the rapidly growing suburbs where transport links aren't as good. Eye scanning helps with charging and security. Congestion charge operates everywhere - this has vastly improved air quality in city centres 	Only the well-off who can afford to live in the city core can afford all the transport solutions. But everyone pays for transport infrastructure via taxes. Poorer households in suburbs rely on cars and pay high prices for fuel.
#3: Regional renaissance 	<i>My city has invested in infrastructure, improved networks so public transport is much better. I now have more choice in where I live, work, and how I travel.</i>	<ul style="list-style-type: none"> My city region is in charge of transport. National government manages the inter-city network of roads, rail and canals. I pay more in regional taxes but get more – a less congested system, better access, fewer delays and breakdowns. New innovations like tram-trains operate on both inter-city and regional networks. We share data via biometric cards which track and charge users. I can tailor a monthly package of services just for me. Public transport is so good that I don't need to run a car any more. 	Through heavy taxation, and moderately-priced fares.
#4: Carpool 	<i>We share our cars now; with high oil prices, congestion, and austerity, it makes sense.</i>	<ul style="list-style-type: none"> Incentives like High Occupancy Lanes, taxation of private vehicles and Shared Car rebates mean that the majority of car journeys are shared Electric vehicles help us save money Buses and trains are stressed as city populations continue to grow and public investment remains patchy. 	The high rates of vehicle sharing mean that transport costs are affordable. Plus, although the public transport system is dated, it is a cheap way to get around.

Regional Renaissance

Regional renaissance was the most popular transport outcome in the workshops, with many participants liking that this provided a high quality public transport system. For some this was the case even if they mostly drive – these participants thought our current dependence on the motor car is partly because of the poor current state of public transport, not necessarily because people prefer driving for its own sake. However, a few participants (particularly those with several children, very hectic lives or those with a disability) preferred to retain the personal freedom of having their own car and thus did not favour this outcome.

Reduced congestion was also important – across the workshop locations traffic was raised as a major current problem, and easing it something they would like to see addressed in the future. Regional renaissance looked to be able to achieve this.

“Having it like this would actually free up the roads more because people won't feel the need to have a private vehicle but even if they've got their vehicle they wouldn't use it as much because the transport is more reliable.”

Workshop participant - London

This outcome operated via the use of biometric cards. Whilst this was not the major attraction of it, a few participants mentioned these cards as providing ease of use and saw them as extensions of existing card-based payment systems such as Oyster or using contactless bank cards. They thought in turn these could encourage uptake of public transport if they enabled a more efficient and easy to use transport system.

A few participants were concerned about the data sharing inherent to these cards. For instance, they raised questions over who would have access to the information held on an individual's journey and whereabouts, and what this information would be used for and by whom.

"It's a public liberty thing, isn't it? I should be allowed to share what I want to share about my whereabouts and that doesn't presume my guilt for doing something illegal...If I want to disappear off for a walk round the hill and people are like, oh where've you gone? There's suddenly this presumption of guilt because you're not prepared to share where you are all the time. And I just don't think that that's right."

Workshop participant - Glasgow

One possible disadvantage raised over this outcome was that it was funded by higher taxation. Many participants did say this was the worst thing about it, but nevertheless this was not a barrier to them having a favourable view overall i.e. as long as the service was good it would be worth paying for.

Me Mobility

This outcome was very popular among online community members, with many saying it was the most appealing, similar to regional renaissance. However, it was viewed somewhere in the middle by most workshop participants, with most deeming this either the second or third most appealing transport outcome.

Among community members, many said it appealed due to the low cost to the user and several thought that it offered good flexibility. The idea of less commuting was appealing, with several mentioning that reducing the time spent travelling to work would improve their quality of life. Whilst not mentioned as a concern for all, one community member said that, as someone with a disability, the level of personal freedom afforded by this outcome was particularly attractive.

"As a disabled person and wheelchair user for whom mass commuting is a nightmare and very difficult, this is a great option. I like and need personal space when travelling and accept heavy traffic as a given."

Online community participant

Many workshop participants said the best thing about this outcome was that it was environmentally friendly as the prevalence of electric cars would mean less pollution. However, overall views were mixed – several were concerned about the extent of data sharing necessary in this model because for example they thought data could be sold to insurance companies or used for other marketing purposes. It also appeared to offer limited freedom of choice in terms of modes of transport. A few participants were concerned about the equity of this outcome, worrying that it could be complicated to use and put off some older people.

Two Tier Town

There were mixed reactions to *Two Tier Town* among workshop participants, with a roughly even split between favourable and unfavourable views. However, it was extremely unpopular among online community members, with around half saying it was the least appealing. Those who liked it highlighted the excellent public transport service available to those living in city centres.

However, the workshop and online community participants who did not find this outcome appealing pointed to the inequality inherent in it, which was an important principle throughout this research and is discussed in more detail in Chapter 4. Participants did not like the idea of a large segment of the population on the fringes of the city being unable to access the high quality public transport and receiving a lower quality service. It was felt that this would hinder physical and social mobility.

“Sounds like it is only for the rich and the poor get poorer. How can poor people get richer, if they are being penalised for living in the suburbs because they can't afford to live in the city.”

Online community participant

A few participants in London also highlighted that a knock on effect of this could be that as the relative attractiveness of living in cities increases, house price disparities would widen and the affordable housing crisis could worsen.

Car Pool

Overall, this was the least popular transport outcome – the majority of workshop participants said it was the least appealing, as did around one in four online community members.

For many workshop participants and online community members the very premise of sharing a car with strangers made them uncomfortable. At best they resented the loss of personal space, whereas some had safety concerns that are not present with public transport. For example, they were unsure about being driven by someone who had not been accredited or licensed in any way, and worried about the safety of lone female passengers in particular.

“Shared transport can be dangerous and one loses one's independence as one has to rely on others.”

Online community participant




Some also thought that this outcome would be bad for the environment, preferring a future that was less dependent on the motor car.

A few did find this outcome appealing. In contrast to other community members, they thought this model would benefit the environment as there would be fewer cars on the road than today, whilst also being a low cost transport system.

2.5 Water

The three different water outcomes that were presented to participants are summarised below. A more detailed version of the outcomes is included in the appendices.

Figure 8: Summary of water system outcomes

Name		WHAT DOES THIS FUTURE LOOK LIKE?	HOW DO WE PAY FOR IT?
#1: Community Patrol 	<i>Community co-operatives put pressure on local citizens to conserve and manage water. This means I reuse my water and my community can trade it.</i>	<ul style="list-style-type: none"> Water is seen as a valuable resource, managed by the local users and self-policed by the community. The costs of products now incorporate the full water footprint, making things more expensive. I use a smart meter to monitor my water use. I collect rainwater and reuse 'grey' water from my bath and kitchen e.g. to flush the toilet. When there is a surplus of water in my community, we trade it with other communities. 	Through the local cooperative. Because my community monitors the amount of local water resources we use, I pay the real cost of the water I use. If I exceed my water 'allowance' I can buy credits from others in the scheme, but at a premium cost.
#2: Smart Water 	<i>My city is 'smart' - everything from water pipes to footpaths collect data on usage and impact. There are many competing service providers.</i>	<ul style="list-style-type: none"> There is government investment in green infrastructure. I no longer have to think about water scarcity and water efficiency – my smart city takes care of it for me. Technology means there is much more focus on closed loop solutions. Smart pipes monitor water, filters recycle precious resources like phosphorus out of sewage water. My home has a green roof and rainwater harvesting solutions. All the grey water in my home is reused thanks to smart appliances. 	Water is very expensive, but technologies that help me use water efficiently mean my water bill is not too hard to hard to bear. I am taxed heavily for high tech 'smart services', but do not mind too much as everything runs so smoothly
#3: Make do and mend 	<i>After many extreme weather events there is a "make do with less" mentality in society – it's necessary to harvest and recycle water where we can.</i>	<ul style="list-style-type: none"> Extreme weather events are now common in the UK and I am therefore more aware of the need to conserve resources. Water supply has been re-nationalised. Every household has been given a rainwater harvesting tank. The government is working on developing desalination technology which can be used across the UK. There is good community spirit in my city – local people work together to take responsibility for managing their resources. Water intensive businesses (e.g. agriculture and food processing) are moving to areas with more reliable water supply. 	We pay through tax and high water bills. I try to cut the costs of my water by installing rainwater harvesting and recycling solutions in my home

Smart Water

Smart Water was the favoured water outcome across all three cities and the online community. Participants saw the benefit of long term investment in green infrastructure in terms of how this would impact upon water usage, and particularly liked the fact that this outcome allowed individuals a greater degree of autonomy than either *Community Patrol* or *Make Do and Mend*, both in terms of government and social pressures and the choice afforded to individuals through the system being largely governed by several competing private companies.

"We should all be reusing water and water companies competing might help to encourage this."

Online community participant

The particular technologies that formed part of this outcome (such as smart pipes and grey water recycling) were generally well received, and it was seen as a positive that these technologies would help people to increase their water efficiency with minimal effort.

Although the description of the outcome stated that these technologies and services run smoothly, one criticism made by a number of participants was that this outcome might be overly reliant on technology, and at risk from technological malfunctions. Some also worried about other potential risks of a smart water system, such as hygiene and toxicity of water if things like pesticides made their way into the closed-loop system. Heavy taxes and the cost of investment were also highlighted as potentially negative aspects of this outcome.

Make Do and Mend

While many participants highlighted the autonomy and level of choice within *Smart Water* as a positive aspect of the outcome, the positive of *Make Do and Mend* mentioned most often was that this outcome featured a nationalised water system. Water services being run by a single national provider was thought by many to mean that water services would be reliable and accountable. Some also saw this outcome as a development of current trends in the way we view water, with individuals changing their behaviour to recycle and ration water, treating it as a resource. It was seen as a positive that this outcome involved communities supporting each other in these behaviour changes, with the government also providing support.

“In keeping with the way we try to live at home. We conserve water and reuse where we can. We have water butts etc, but with the government support, we could do more.”

Online community participant

Some did however see the heavy regulation of this outcome as a negative, and the high cost of implementing and maintaining the system was also mentioned by a number of participants. In addition, some saw this as a temporary and not fully sustainable solution to the problem of water scarcity, which would not be able to withstand extreme weather or natural disasters which may lead to even greater scarcity.

Community patrol

Community Patrol was the least well received of the three water outcomes across all three workshop locations. Particularly disliked was the idea of social or community pressure being applied to individuals in order to regulate their water usage. A number of participants were averse to the idea of their neighbours knowing how much water they were using, and this outcome was described as 'bleak' and 'Orwellian'. Controls within this outcome, such as the setting of allowances and penalisation for over-use, were thought to be too intrusive and too strict considering water is a life essential. It was thought that this outcome could have more effect on some citizens than on others, as different people have different needs when it comes to water usage (those with young families, the infirm, single adults etc), and a number thought that this could lead to a divisive system.

“I do not like the idea of a premium if I go over my allocated water allowance, unfortunately we need water to survive and I don't think it should be treated like mobile phone minutes.”

Online community participant

Where positive aspects of 'community patrol' were mentioned, these tended to be because it was considered to have an eco-conscious ethos at its core, and that it allowed for a trading function between communities. Some felt that keeping power over water usage in the hands of individual communities could lead to individuals becoming better educated about water usage and more aware of the effects of using too much.

“This truly is a “we’re all in this together” way to do things. It’s the fairest solution, and probably the most efficient too.”




Online community participant.

A number of participants thought that allowing communities to trade surplus water with other communities was a positive step. There were however, questions over how such a system would work and whether it would be fair towards water stressed regions. There was also some degree of uncertainty that water would ever be so scarce that trading would be successful.

2.6 Waste

The three different waste outcomes that were presented to participants are summarised below. A more detailed version of the outcomes is included in the appendices.

Figure 9: Summary of waste system outcomes

Name		WHAT DOES THIS FUTURE LOOK LIKE?	HOW DO WE PAY FOR IT?
#1: Patching things up 	<i>A lack of resources means my city has to recover much more of its materials. I work hard to make the most of what I’ve got – I can’t afford to just throw stuff away.</i>	<ul style="list-style-type: none"> We live in a much less wasteful society because we have no choice – many resources are in short supply or just don’t exist anymore. The things I buy are often made out of recycled resources. I also make new things out of old products around the home. New products are made to be easily recyclable Waste collection and resale is big business – the stuff we used to throw away is now worth money, so sometimes waste is ‘stolen’. 	The prices of products include the cost of reprocessing and recycling them. Less environmentally friendly goods cost more, to encourage me to keep things longer and waste less. The government contracts companies, who make money from collecting, reprocessing and recycling waste.
#2: Repurposing 	<i>I buy less stuff but I really value the things I have and, because they are high quality and made well, I keep them for longer, creating less waste.</i>	<ul style="list-style-type: none"> There has been a backlash against high consumption. We are not as rich as we were but we need fewer things, consuming what we need and no more The things I own are made to last ‘for life’ – my mobile phone, furniture and car are high-end desirable items that I might pass on to my grandkids. Products have been designed so they produce little waste. The companies that make the products are responsible for paying for final disposal. Many products are ‘modular’ – if it breaks I replace the broken part. 	We buy one thing and keep it for life, which makes expensive things more accessible. We co-purchase and share products (e.g. tools and cars) when we cannot afford to buy our own. Municipal waste levels are drastically cut, which reduces our taxes.
#3: Sorting things out 	<i>Waste is managed using government-run, high-tech systems that collect and process our waste efficiently. I do my bit because there are high charges to throw waste away and fines if I don’t comply.</i>	<ul style="list-style-type: none"> Technology means the different things a product is made of can be identified and tracked from inception to end of life. I have to separate all my waste, but everyone benefits as it’s easier and cheaper to process it. I pay exactly for what I throw away and get fined if I get it wrong. Autonomous vehicles collect my waste. Some cities have automated underground waste systems. Much less waste goes to landfill, and lots is recycled, and a big amount goes into energy generation – it can be burned and organic material can be anaerobically digested. 	I am charged for the waste I produce, both the amount, as well as type of waste – so I want to reduce the waste I produce. If I dumped my waste, or throw it away in the wrong way, I would be fined.

Patching Things Up

‘Patching things up’ emerged as the favoured waste outcome across all three workshop locations. Many of the participants recognised current problems with the waste system which this outcome would help to deal with. A number of participants saw the introduction of a ‘carbon price’ on goods as a positive step that would help to reduce over-consumption and help us to be less wasteful. It was also thought that this outcome might help individuals to develop new craft skills as making everyday items becomes more common.

As mentioned, a major theme across locations in discussion of the waste system was the feasibility or likelihood of a given outcome, with participants tending to favour the outcome they saw as most realistic given the current state of things. A number of participants highlighted that people's perceptions around waste and waste disposal are changing as people realise there are problems to be resolved – some saw 'patching things up' as something that is already beginning to happen, and this lent feasibility to the outcome which made it favourable to some.

"I think more people are starting to think about, right, well, do I just chuck that out or do I try and reuse it. I know a lot of my pals when we'd be moving into houses or whatever and they're getting rid of furniture, it's not just a case of just chucking it in a bin. They're putting on Gumtree or putting it on eBay or giving it to people who can't afford maybe to get, I've seen clothes and stuff like that."

Dialogue participant, Glasgow

Furthermore, and related to the idea that the ethos of this outcome was considered to be already underway, some saw the repurposing that was part of patching things up as being something that has become gentrified and fashionable. In particular, participants reported seeing this for things like vintage clothing and furniture which they felt had become sought-after items and had attracted premium prices. Consequently, participants also raised concerns that this might only be attainable for those who could afford to.

Potential issues with this outcome were, however, highlighted. While some believed that development of creative skills would be a positive element of this outcome, others thought that it could be unequal, as some may not have the requisite skills and knowledge to get by in this world. The potential costs of this outcome, both in terms of time and money, were also mentioned.

"Perhaps some of the working week should be redistributed to a personal project, if you will, in order to be able to reuse your goods yourself in order to be able to reprocess things yourself."

Dialogue participant, Glasgow

Repurposing

'Repurposing' was similarly seen as an outcome in which some of the current issues around the waste system would be solved. 'Repurposing' was seen as a positive use of resources, with better quality, longer lasting goods and products. It was also thought that this outcome might help to build positive attitudes towards work, with skilled craftsmanship by individuals becoming highly prized. Some thought that this might in turn help to foster positive attitudes towards work in individuals. This outcome was the overall favourite of participants involved in the online community with around half picking this as their favourite of the three waste outcomes.

"I like the acknowledgement that we are a highly wasteful society and that products are made to be repaired where possible and not with a built-in obsolescence as there is now."

Online community participant

Discussion of this outcome did however highlight a number of concerns among participants. The greatest concern was around what this outcome would mean for future innovation, with a number fearing that building things to last and keeping the same products throughout their full life cycle would lead to stagnation in design and innovation.

“Technology’s always going to be improving but if you’re stuck with the same thing for 50 years.”

Dialogue participant, Glasgow

It was also thought that some products simply weren’t fit to last and, perhaps more importantly, that people would not be willing to keep products for longer than they currently do.

“If we’ve been brought up in a world where we’re always striving for better things, I just think you can’t change somebody’s mind, like if the kids these days are growing up to wear nice clothes and everything, you can’t just put it on them like, not like you’re going to have your clothes for life.”

Dialogue participant, Glasgow

Some felt that if people were unwilling to keep products throughout their full life cycle, this outcome could disadvantage the poorer in society, as high prices would force them to keep products for longer while those with more money could afford to replace products more regularly.

Sorting Things Out

‘Sorting things out’ was the least favoured option across all three workshop locations, and the online community, primarily because participants believed that this outcome involves too much government control and not enough freedom of choice for the individual.

“A forced controlled system doesn’t engage people to take part.”

Online community participant

Participants spoke of a ‘big brother’ system with heavy regulation where the government has increasing control and people are motivated by punishment rather than a desire to do things right. Ultimately, participants felt that punishment was not the most effective way to encourage socially desirable behaviours.

“It’s all, more like the kind of stick instead of carrot. There’s no incentive for you to want to recycle, you’re just getting punished if you don’t.”

Dialogue participant, Glasgow

Participants in all three locations and the online community were able to pick out positive elements of this outcome – for example, the fact that it involved a system in which very little waste was disposed of in landfill was highlighted as a positive element, as was the creation of jobs and the use of greener energy.

The image features a dense, intricate network of white lines and nodes on a black background. The lines radiate from a central point at the top, creating a sense of depth and perspective. A prominent vertical axis runs through the center, with a semi-transparent grey rectangular bar overlaid on it. A red rectangular box is positioned horizontally across the middle of the image, containing the text "Integration of city systems" in white, bold, sans-serif font.

Integration of city systems

3. Integration of city systems

The reconvened citizen summit asked participants for their views on the three future city visions created to illustrate different ways in which integration of systems could occur in UK cities; *Repair and Share*, *Devolution Revolution* and *High Tech High Choice*. These scenarios were created by Forum for the Future based on the feedback and preferences from the first round of citizen workshops which discussed the system outcomes. The full detail of the three scenarios is included in the appendices but a summary is also provided at the beginning of the chapter. This includes the stimulus presented to participants - a written description of the scenario, a visual representation of a typical street in this city to illustrate system integration, and the timeline of events that led to this scenario occurring.

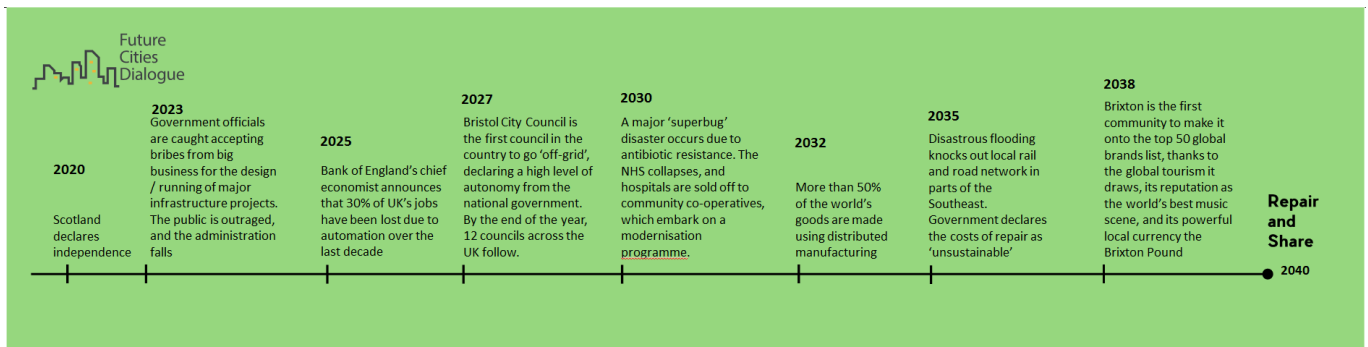
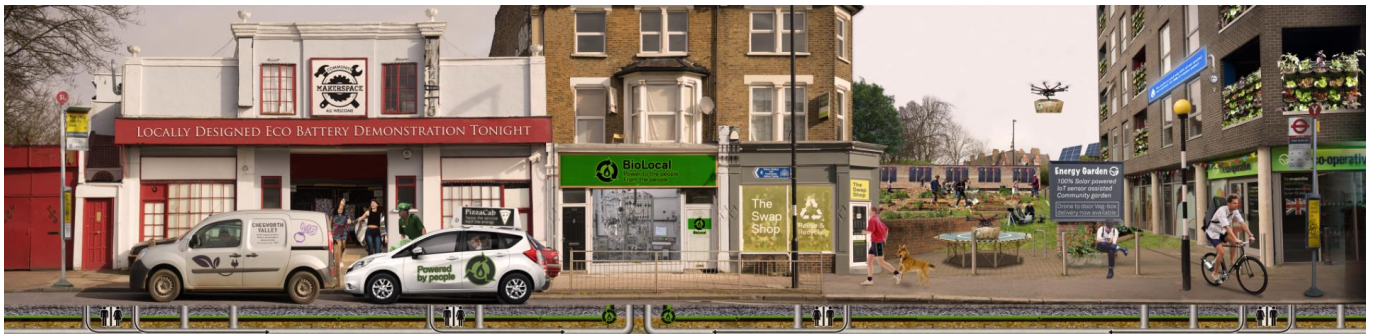
A summary of the reactions of participants to the scenarios is below:

<p>Repair and Share</p>	<p>Participants liked the strong sense of community in this future, working together for the collective good. Participants felt this would foster entrepreneurship and a high degree of personal interaction, which contrasted sharply to High Tech High Choice. The economic and governance models in this future were seen as having sustainability at their core, and far more than in the UK's cities today, which was also appealing. The highly localised nature of innovation was widely welcomed, with many seeing this as giving ownership to local citizens, and ensuring that integration would cater for local citizen's needs.</p> <p>Participants however struggled to envisage this future ever manifesting itself – whilst the community aspect was highly positive many saw it as unrealistic and utopian, fearing that people would be too selfish for it to work, with some free-riding on the contributions of others. There were also major concerns regarding inequality. Participants thought that communities without key resources could be left behind as it appeared that communities were broadly self-sufficient. People wanted to see connectivity between communities to help foster cultural exchange and a better quality of life – an ability for communities to trade in goods but also skills, was therefore seen as essential to acceptability of such a future. Some also worried that those unable to contribute to the community would be left behind. Finally, this future seemed to focus on productivity at the expense of fun and socialising.</p>
<p>Devolution Revolution</p>	<p>Participants liked the balanced governance of this future. Some participants held a degree of distrust in national government, but liked the idea of working for each other, with some form of government oversight. This future provided a safety net which many felt was missing in Repair and Share. This governance helped this future seem the most equal, which was a key principle undercutting much of the discussions. This world also made good use of technology to use resources more efficiently. Furthermore, discussion of this scenario highlighted that high tax can be acceptable if it guarantees a good quality service, although there was scepticism that this could ever be the case.</p> <p>One of the main concerns relating to this future was about the extent of 'nudging' towards socially acceptable behaviour, which many found invasive. Participants sought assurances that these nudges could be ignored or 'switched off', and wanted to see a degree of choice in how citizens live their lives.</p>

<p>High Tech, High Choice</p>	<p>This was the least popular future scenario. Many participants felt that technology was overly pervasive, particularly to the detriment of face to face interaction and socialising. Many highlighted concerns that this would lead to isolation and mental health problems. While participants welcomed the use of technology to save time and provide efficiency with functional tasks such as travel and resource use, this did not extend to all systems, in particular food. The options provided by technology for more convenient alternatives, such as 3D printed meals, were welcomed but only if by choice and not if it were the dominant practice. Participants preferred a food system that encouraged social interaction even if this required more time and personal energy. Many considered online interaction as an inferior alternative to face to face contact. Furthermore, this future involved a dependence on technology which many felt could leave us susceptible to its failure if there were not a strong and resilient infrastructure behind it. Furthermore, many voiced concerns that a future overly reliant on technology could result in the loss of important skills and creativity, and thought that heritage products would not be protected in this future.</p> <p>The dominance of the private sector in this scenario was also strongly opposed, as participants thought it would lead to a highly unequal future. A similar concern centred on the ability of the poorest and least able to adapt to technology to 'get by' and live within a hi-tech world. Furthermore, privatisation of the health care system was particularly disliked, as noted in the previous chapter, as this was generally associated with an exacerbation of health inequalities.</p> <p>Nevertheless, there were some perceived benefits to the hi-tech nature of this future, which for example would help use resources more efficiently.</p>
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3.1 Repair and share

Repair and Share. Communities - mostly structured alongside existing urban neighbourhoods and councils - are very strong and cohesive. Police, water, energy services are decentralised and managed by local councils and co-ops. Planning no longer happens at a national level, but within local government and communities. Some communities are wealthy and resilient, and others started off with fewer resources so are able to achieve less. This means the same security isn't offered as before. For example, when there is a bad year, hunger and malnutrition increase. Many systems are run by community initiatives, such as the waste system being organised and managed so that products are recycled from community waste, and transport is dependent on car-pooling and sharing taxis. Health is monitored by wearables in your clothes and jewellery and is used by the health provider to reward health behaviour.



This scenario was seen as idealistic overall in that whilst participants saw the focus on community and sustainable living as laudable they were not convinced it would work in practice. There were also concerns over the level of equality and the enjoyment of day to day life in this scenario.

Community

One of the most appealing elements of this scenario was that it was based on a strong sense of community. Participants liked the idea of citizens working together to improve their local area and having a greater connection to their community. Many participants believed this scenario placed collective responsibility on individuals to make the community work, rather than relying on government or other bodies, which was seen as positive. Several participants thought this was something we should strive for, and contrasted it with our current lifestyles which it was felt are more focused on the individual than community. Participants also favoured the degree of physical interaction that innovation and creativity are based on in this scenario, which is in stark contrast to *High Tech High Choice*.

However, many participants thought this aspect was appealing in theory, but was not realistic. Some doubted that all citizens in a community would contribute – they were concerned that there would be some 'free riders' who benefited from the hard work of those more dedicated to the community.

"It would be the same people all the time who do everything, for example work in the community garden. This would cause ill feeling between the community rather than bring it together."

Online community participant

This scenario therefore raised a key tension participants faced when discussing the future – in many cases they wanted to think the future will be better than the current situation. However, where the future seemed too far removed from the status quo it was seen as utopian and unviable. This turned many participants away from *Repair and Share*.

The fact that innovation in this scenario was community driven and owned was also liked. Participants liked the freedom that citizens would have to drive innovation in their local area and that this would be supported through local innovation hubs (the 'Makerspace') and the access to resources they would provide. This scenario was seen as being supportive of entrepreneurs. Many participants also liked the emphasis there would be on learning new creative skills.

Inequality

While Repair and Share was considered supportive of entrepreneurs and creative citizens, many participants had concerns over the potential it had to create inequality, both within and between communities. To many participants it appeared that communities were generally self-sufficient, creating and consuming what they need, but relatively isolated from other communities. While harnessing local resources was seen as positive, there were concerns about the prospect of a community lacking key resources, such as land to grow food, the ability to generate energy locally or the skills within the community to innovate and thrive. It did not sit well with these participants that some communities could be left behind whilst others thrived – they would prefer to see a future that is more equal, even if that means that the most successful would be worse off.

It also raised the question for some of how communities could be better connected, for example in the trading of skills and goods. This future appeared to participants to lack any connection between different areas, and some believed it would actually lead to unhealthy competition as there would be no incentive to trade with, or support, other communities.

Within communities, some wondered if those less able to contribute – the elderly, infirm or those lacking the requisite skills - would also get left behind.

“Everyone has to pull their weight. There would be a feeling of discontent towards those that couldn't contribute e.g. the elderly or disabled.”

Online community participant

The lack of a government safety net in this scenario meant that there were concerns if such groups would be provided for in the way that they are now.

Connectivity between communities

Several participants also thought that too much focus on local communities, without consideration for how different communities connect, would have impacts on citizens' quality of life. This would be the case even for those in successful communities who did not rely on this interaction for survival, but for their wider well-being. For example, for many participants it was important to them to be able to trade with other communities to get access to other goods. Some participants also highlighted the importance of physical connectivity and felt that the fractured and disconnected transport system did not provide this sufficiently well.

Another criticism of this scenario was that it could restrict mobility. It was felt that some citizens would build social capital in such a defined local area, that it would be difficult to move from one area to another, which in turn would hinder transfer of skills and knowledge.

Lack of culture

Another perceived negative aspect of Repair and Share was a lack of culture. A few participants thought that everything in these communities was done for the benefit of the greater good, for example working to produce food, or generate energy. They were therefore concerned that there was not scope for 'unproductive' activities such as socialising for its own sake, or culture.

"It seems to be a world with a lack of frivolities, which sometimes you need."

Online community participant

However, in contrast some felt that the one element of successful competition could be around culture and creativity. The reference to areas like Brixton being creative hubs led some participants to see this scenario as a way that cultural and creative competition between areas could be actively encouraged.

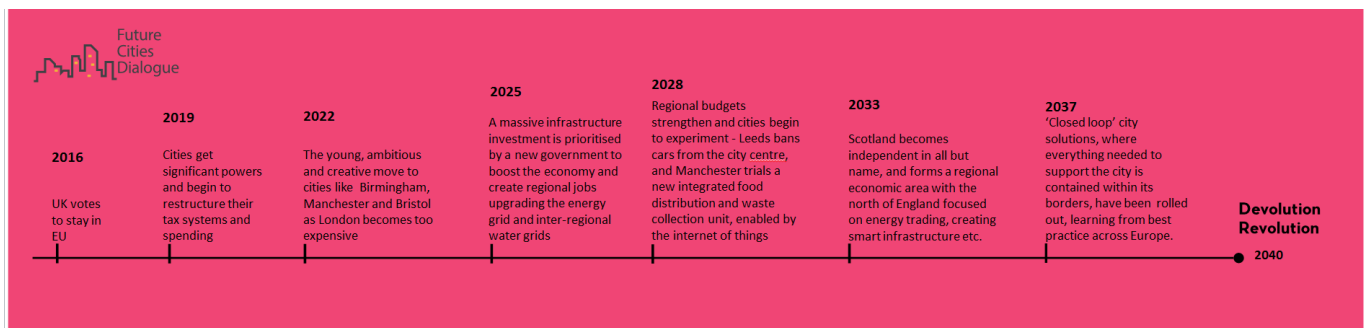
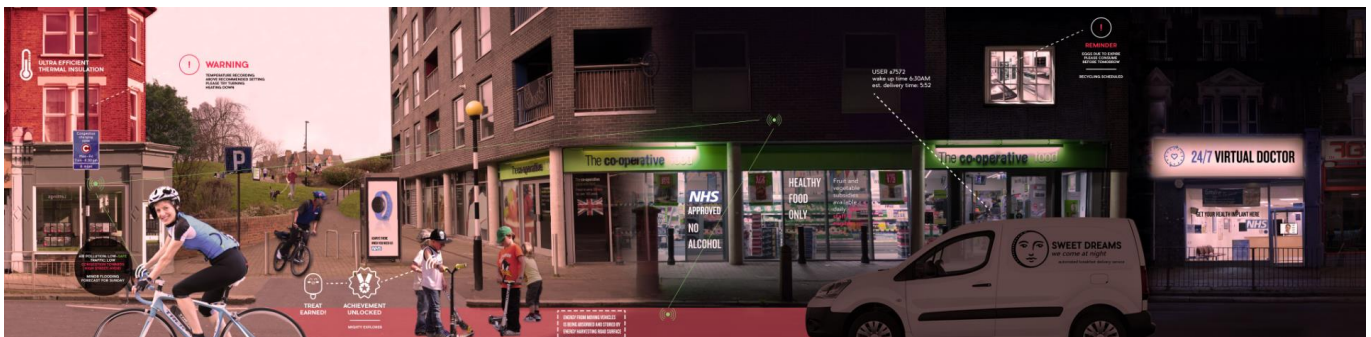
'Green'

Another positive aspect of Repair and Share was that it was seen by many participants as being greener and more sustainable than our current way of life.

There were several facets to this. Some participants pointed to the way that more resources are reused, for example by making products from recycled materials or recycling of water. Others liked the use of clean energy supplies

3.2 Devolution revolution

Devolution/Revolution: In this world, the regional government is strong and national government has invested in regional areas, a federal system to governance. Cities have the power to raise taxes and deliver services in social care, health, and transport, and set up much interconnected systems. Each city really has just one 'system'. Technology is revolutionised in all systems, for example; synthetic meat is common, remote health analytics are used, and waste collections are linked to smart bins and fridges which nudge people to behave appropriately. Overall, desirable behaviour is encouraged through interventions such as subsidised fruit and vegetables, and technological innovations like heating systems which reminds people to turn the heating down.



Overall, this was the most popular scenario. It seemed a good compromise, retaining some of the localism of *Repair and Share* whilst also having more government control and the associated safety net. It offered reasonably equality and good public services, although the importance of data and nudging was not always popular.

Balanced governance

The main appeal of this scenario was its balanced governance. This was particularly the case among workshop participants who spent a long time comparing and contrasting the scenarios and their governance systems, whereas community members may have looked at each in isolation.

The governance system seemed to be a good compromise between the localism ideals of repair and share, and the status quo of more control by governments. The workshops revealed that there is certainly distrust of the government and the idea of people working for each other was popular. However, in certain aspects participants still preferred central control, particularly for the health system and law and order, or in providing oversight to ensure no one is left behind for example

with community food production. Regional powers were also popular with some participants as they wanted to see money raised in their local area spent on local services. This type of governance was considered as a way that central control could be maintained where it is most needed while giving devolved freedom in other areas such as energy production.

There were however concerns that some regions could be left behind others, but this was not seen as significant a problem as disparity between communities in *Repair and Share*. Indeed, many thought this governance model would lead to fairer outcomes than the other two scenarios.

'Green'

As with *Repair and Share*, this scenario was seen as being good for the environment. However, this took a slightly different form in *Devolution Revolution*. Whilst the basic principle seemed to be similar, i.e. that resources are used more efficiently, participants liked the use of technology to achieve sustainability in this scenario. For example, the energy from waste generation was praised. Technologies that supported household level waste and energy reductions through information provision were also liked by some, particularly where they gave practical support to citizens.

"The gentle nudge to remind about food status with potential recipes sounds great."

Online community participant

Invasive

These technologies were often liked but this was contingent on the level of control that citizens would retain. One of the main drawbacks associated with this scenario was that, for some, it seemed invasive and an overly controlling 'nanny state'. 'Nudging' by the government was a key feature of *Devolution Revolution*, along with restrictions of things that encouraged socially undesirable behaviours like fast food outlets and the banning of meat in public institutions. Some participants did recognise this could lead to positive outcomes for example in terms of better personal health, or reduced energy usage or waste.

A key limit to the acceptability of this type of initiative was the level of choice and control that citizens have. While 'nudging' (for instance, advice and reminders through health trackers and smart houseware) was acceptable if it could be ignored or turned off, this scenario was considered to have pushed things too far when it took freedom of choice away from the individual. A total ban on consumer behaviour was not considered the most appropriate way to achieve the end goal.

"Smacks of totalitarianism. When does nudge become mandatory."

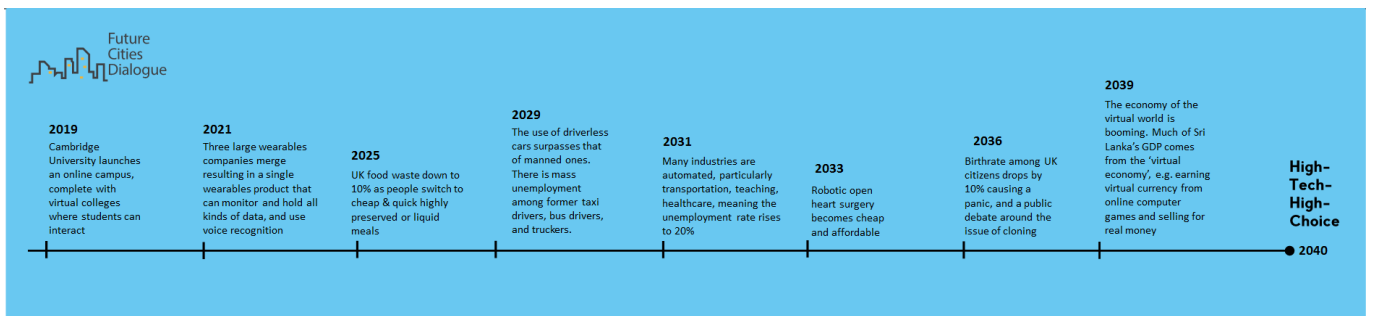
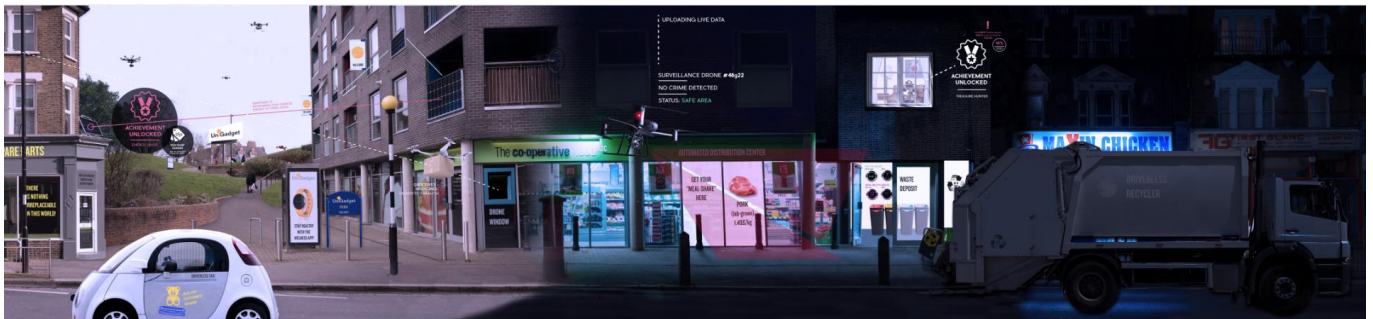
Online community participant

High quality service, even if it is costly

One of the main benefits to this scenario was that it offered good quality public services. The information presented to participants highlighted that these services were funded by higher taxation. However, the discussion around the trade-off between quality and tax suggested many participants are more concerned by value than price. They believed that it was worth paying high taxes if the service justified it. This was particularly the case with transport which was raised in the workshops as a major issue, with transport in this future seen as being clean and efficient. It is important to note that there was a fair amount of initial scepticism that higher taxes would lead to higher quality service. It was thus not the case that participants immediately saw this as a positive – based on their experiences to date many participants were sceptical and thought this additional revenue would be wasted. However, this scenario imagines a world where high taxes *do* lead to better services, and participants thought this was worth paying for.

3.3 High Tech High Choice

High Tech High Choice. The public sector is a lot smaller; we pay lower taxes and get our services from private high tech companies. Technologies have grown through a market. We have very high tech systems but there is less equality as some people can't afford the most high-end products and services, although the small centralised government cover the most basic cost of living. We give away data to private companies through wearables and other devices to access services and pay less for them. Technology has changed many aspects to systems; food is functional with the right amount of nutritional values, and no one cooks their own meals but gets it delivered or 3-d printed. Health is monitored by nanobots in the bloodstream for those who can afford expensive treatments. Data sharing has made it so anyone in a community can see how much water you are wasting.



High Tech High Choice was generally the least popular of the three future scenarios. Participants thought it would lead to a world of isolated individuals rather than a community, and also did not like the dominance of the private sector – discussion of this scenario highlighted that whilst there is distrust of governments, they are nevertheless seen as important in providing oversight and a safety net.

Isolation and dependence on technology

One of the main reasons cited by participants for not finding this scenario appealing was that it suggested major changes, for the worse, in social interaction. It seemed that interaction would take place, if at all, much more online than today with limited face to face interaction and socialising. Participants were strongly opposed to this – they wanted to allow space and time for socialising face to face, feeling that doing everything online was not an adequate substitute. Many participants thought the loss of this traditional form of human interaction could lead to isolation and mental health impacts.

“The idea of food being replaced by drinks makes me sad. Cooking and eating together are important. It seems a very lonely world with everyone shutting themselves away and doing everything virtually. I see depression being much higher in this world.”

Online community participant

Wider research has shown young people are more likely to be particularly active on social media, for example 34% of 16-24 year olds visit social media sites or apps more than 10 times per day, compared with 23% of all adults.⁵ Nevertheless younger participants also wanted to preserve face to face social interaction and feared an over-reliance on technology for communicating.

“For me it has to be face to face. I don’t class them as equal levels of interaction.”

Workshop participant

Most workshop participants highlighted the loss of the social element of cooking and eating as particularly detrimental. *High Tech High Choice* suggested a future where meals were ready-made or 3D printed, which in theory would be more convenient and offer a wide choice of meals at very low cost. However, most participants questioned whether convenience should be the most important factor, especially if it meant losing the social benefits of mealtimes. Similarly, several participants said they enjoyed spending time cooking so would not want to give this up.

“Food would be boring and we would lose the social aspect of eating together and may lose a lot within the family home - not having a kitchen as the centre of the family.”

Online community participant

Some participants also had an underlying concern that this dependence on technology could also leave us vulnerable if the technology failed, and were unsure if safeguards to prevent this would really be effective in the case of mass loss of power or cyber terrorism.

Loss of creativity and skills

A small number of participants expressed a fear that we could be ‘made dumb’ by technology and lose important skills.

“I’m not entirely sure what the role for humans is in this world.”

Online community participant

“It seems like everything here is dehumanising, you’re losing a skill and social aspects of life in general. Making us robots, not human, not sociable, losing every form of skill.”

Workshop participant - London

Participants were concerned about a lack of scope for creativity. Some said that they would feel less happy if they were no longer making things for themselves, and that given the dominance of big business it might be hard for entrepreneurs to

⁵ http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr15/UK_-_Full_charts.pdf

market new ideas. Furthermore, some raised a fear that certain cities, communities or sectors may not receive investment if the private sector did not see them as attractive and thus be left behind.

Inequality

Inequality was a recurrent theme across all scenarios and was an important principle for many participants. Thus the perceived inequality of *High Tech High Choice* was another major reason for its unpopularity. Overall, many participants thought this future would benefit the rich at the expense of other members of society, such as the elderly and the poor, which they were not comfortable with.

Other groups that it was feared could be left behind in this scenario were those with mental health problems or those without the skills needed to flourish in this technologically advanced world. This was felt to apply in particular to the elderly who participants (particularly the more elderly ones) thought could be less likely to interact online, even in 2040.

This future is dominated by the private sector, and this governance system was seen as a major contributing factor to the perceived inequality. In part, this was because participants felt that access to technology was integral to prosperity in this scenario, but technology would be largely provided at a cost by the private sector. There were fears that this model would potentially exclude those who could not afford technology from taking part in many aspects of life.

The privately run health sector was also seen as contributing to inequality. Participants were strongly opposed to privatisation of the health system, and this indeed was a theme that was important when discussed in the system outcome workshops. There was greater public acceptability for private ownership of some systems than others, with health seen as particularly important to keep under government control. In this context, participants were concerned that if health care was privatised the less fortunate would not be able to access the healthcare they need.

“Too much dependency on private companies and an end of the NHS would mean health is at risk even with high tech wearables - I wouldn't want to know how quickly I am dying if I couldn't afford to do anything about it.”

Online community participant

Participants thought that this could widen current inequalities in health and reinforced their desire for a government safety net to protect the less fortunate.

“Poorer areas or areas with higher unemployment would struggle... It is in these instances where we need a good national governance to help with equality.”

Online community participant

Participants also felt there were further health inequalities that could arise due to the dependence on technology. Technology in this scenario facilitated more remote delivery of healthcare and diagnostics. However, some participants thought this would not be suitable for some of the most vulnerable in society. For example, some were unsure if those with mental health problems would be able to get the treatment they need remotely. There was also concern that certain groups would not be able to access remote treatment if for example they did not understand the technology.

There were also worries that inequalities would also be sustained by unemployment. In this scenario, high automation has led to high job losses and participants were concerned that there would be little help for the unemployed as the government

safety net was described as basic. Furthermore, some participants were concerned that these changes in the labour market would disproportionately affect certain groups whose industries had been so clearly revolutionised by technology in this scenario, such as taxi drivers. There were mixed views over the degree to which the employment market and the skillsets within it would adapt to this changing landscape.

“I would not see it as a world where people lose jobs, but it is changing, the traditional jobs are changing and the skills would be different.”

Workshop participant, London

Technological benefits

Whilst overall the technological dependence in this scenario was not viewed positively, some benefits were identified, particularly in terms of resource efficiency and the associated environmental benefits. For example, the concept of smart fridges reducing food waste, and driverless solar powered cars reducing pollution and congestion were both well received.

Some also liked the idea of technology facilitating working remotely, and spending less time commuting, as this would help with quality of life as well as saving energy and reducing congestion. There also appeared to be more choice in what people do or consume, and how they behave.

“The idea that the individual has ultimate choice over their own destiny is also a good principle.”

Online community participant

3.4 What do the public see as the opportunities for integration and which technologies do they want to see?

Participants discussed applications of technology both in the context of the outcomes of the six individual systems, and also as part of the final integrated system scenarios. As part of the discussion of scenarios for the UK's cities in 2040, 10 different technologies were presented to participants to find out which were appealing and which were less so. The summary of citizen responses to these is presented in Figure 10.

Figure 10: Summary of citizen responses to technologies

Technology	Overall assessment	Citizen response
Driverless cars	<p>The most liked technology, but somewhat polarising.</p> <p>This innovation was expected to have the most impact.</p>	<ul style="list-style-type: none"> + Participants recognised that it would reduce accidents, for example eradicate drink driving and help parents control children while driving + Reduce congestion and make cars accessible to those who can't drive, such as people with dementia or visual impairment. Travel would be less stressful as people would not worry about driving. - However some were concerned about the safety of the technology, the legal status of driverless cars, such as liability if an accident occurred, and about job losses among professional drivers - There were also concerns over how other road users, such as cyclists, would need to adapt to different driving practices of driverless cars
3D printers	<p>The second most liked with no one disliking the idea.</p>	<ul style="list-style-type: none"> + Most participants found the idea of 3D printing fascinating and exciting but only had a very basic idea of the concept and were largely unsure of how they work, or what they would be capable of making. Once explained however, people could see the many applications of the technology and thought they could be particularly beneficial in a medical context. - There was less certainty over their application to food, with many being reticent to eat anything produced in this way. The only major concern raised was the potential that they could be used to create illegal items.
Virtual doctor	<p>Virtual doctors were the most polarising technology with a fairly even split between likes and dislikes.</p> <p>Many thought they could have a significant impact.</p>	<ul style="list-style-type: none"> + Participants thought this would be more convenient, saving themselves time for more routine treatments. It was also perceived that medical care for minor ailments would ease the burden on the NHS overall, freeing up doctors for more serious cases. + Seen as positive for people unable to travel to see a GP - Those who opposed their use cited the lack of a personal touch provided with a face to face consultation, and also worries that a remote diagnosis would be less accurate. Further explanation and convincing of its efficacy was needed for some. In particular, mental health was not thought to be catered for if delivered remotely.
Smart houseware	<p>Far more liked than disliked. Although not seen to have the most impact (compared to other technologies).</p>	<ul style="list-style-type: none"> + Smart houseware was thought to save people time around the home, enable more environmentally friendly behaviours and save money. Some also thought that this would mean technology could be more joined-up around the home and less siloed. - A few participants thought the technology would encourage laziness and removed too much of the spontaneity from our lives.

Personal health trackers	Among the more popular technologies and not strongly disliked by any.	<p>+ Participants liked the idea of being able to track their own health, and thought more broadly it would encourage personal responsibility for health and could ease the burden on the NHS, while also alerting people to possible health problems earlier. It should be noted that these were in the context of wearables and we did not present more invasive options such as implants.</p> <p>- The few concerns were mostly that the use of this technology would move from supporting a healthy lifestyle to forcing one, or penalising those who chose not to.</p>
Portable battery pack	More liked than disliked, but not many had strong feelings either way or thought it would have much impact	<p>+ Straightforward and has clear applications as a portable, sustainable energy source, which might even encourage physical activity.</p> <p>- No perceived disadvantages, but some questioned their effectiveness.</p>
Drones	Disliked by many. Some could see the potential applications but had concerns over accountability.	<p>- Not very popular as several participants thought drones would be intrusive and invade their privacy. There were also concerns about crashes and safety for other users of air-space, particularly if unregulated.</p> <p>+ A few did identify positive impacts for agriculture and reducing traffic logistics.</p>
Small scale nuclear reactors	The second most disliked, yet predicted to have a major impact.	<p>- Many participants thought these sounded dangerous, with some extending this fear to any nuclear technology. This was the technology that participants had least knowledge of and most responses were based on general views towards nuclear.</p> <p>+ Nevertheless several did think it would have an impact in terms of providing energy that wasn't dependent on fossil fuels.</p>
Biometric transport cards	Did not generate much debate – not liked or disliked by many and predicted to have minimal impact	<p>+ Participants generally thought these would be convenient in avoiding the need to top-up cards or carry cash.</p> <p>- Concerns centred on the security of sharing their data, and transparency over access and use of it.</p>
Synthetic meat	By far the least popular technology or innovation, although several thought it would have the most impact	<p>- Much of the criticism focused on how this appeared to be unnatural. Many reacted squeamishly and did not find the idea of synthetic meat appetising at all.</p> <p>+ Nevertheless others thought it would have benefits in terms of reducing hunger and the impact of agriculture on the environment. They also said there was a moral argument for using synthetic meat in that it would allow the consumption of meat but without the large-scale loss of animal life.</p>

The background is a complex, abstract digital visualization. It features a dense network of white lines and streaks of varying lengths and orientations, creating a sense of depth and movement. The lines appear to be converging towards a central point in the distance, similar to a perspective view of a road or a data stream. The overall color palette is black and white, with a prominent red rectangular box containing white text in the lower-middle section.

Principles underpinning integration

4. Principles underpinning integration

The ten principles below underpinned participants' preferences for the future cities they wanted to see and the integration they believed the UK should aim for. These principles will help Innovate UK understand public priorities and therefore what kinds of technologies and futures would be publicly acceptable.

The first two principles are those that were the most prevalent; however, the order of the remainder does not signify their importance.

4.1 Equality

Equality was a recurring theme throughout the citizen dialogue discussions, both in the workshops and online. For many participants this was the most important principle governing their preferences for some futures above others.

Many participants were particularly opposed to any delivery of services in which access was determined by what citizens could afford. For this reason, a healthcare system dominated by the private sector was not popular, as access to these services was not seen to be equal. Such futures were seen by some participants as exacerbating inequalities, as if for example the poorest could not afford healthcare then the gap in health outcomes between rich and poor would widen.

Participants were also concerned about other vulnerable groups being left behind as well as those with less money. If cities become focused on high tech solutions, some feared that the elderly or those without the skills to keep up with or take advantage of technology would be excluded from too many parts of city life if low-tech alternatives did not exist.

Similarly, there was a perception that some futures would create and perpetuate regional inequalities in de-centralised governance systems. Participants did not like the idea that some people would be worse off by virtue of living in a community that had fewer resources than others, and called for a system where any such inequalities could be addressed. Trading of regional or local assets - such as energy, water or skills - was one suggested way of rebalancing equality, if a suitable mechanism could be developed and it could be encouraged through incentivisation.

4.2 De-skilling by technology

One fear of the increasing use and importance of technology was its impact on skills – both in the workplace and those we use in everyday life. In some futures, technology would render certain skills and jobs obsolete – for instance taxi drivers in a world where driverless cars predominate. Some participants were worried that technological advancement in particular sectors would leave people struggling to learn new skills and adapt to a new employment market. While some were confident that people would naturally adapt to changing skill needs, there were also calls for government to assist people in re-skilling as necessary.

Some also held reservations that technology replacing simple skills, whilst saving time, is not always a positive thing. This was articulated as 'technology making us dumb'; for example, smart fridges that automatically ordered food that the homeowner was running low on could be seen as removing choice and spontaneity from our lives whilst encouraging us to be lazy. Concerns were also raised that many activities which might be made redundant by technological advancements, such as driving, can be beneficial for brain function and refining motor skills. Participants called for technology that helps encourage and leave space for spontaneity and for practising these skills. People also supported the idea of utilising

technology if it freed up time to engage in other more productive or fulfilling activities. Where skills are no longer needed and 'lost' this was deemed acceptable if they are replaced by skills that have 'value'.

4.3 Localism vs central government oversight

Participants liked the idea of transferring decision making power to local authorities, to bring decisions closer to communities. They also liked the idea of communities running things for themselves as it was felt to provide a more transparent system and one which would encourage greater buy-in and trust from its residents. Across futures and worlds, participants could see plenty of positive effects of a more localised system of power. For example, communal energy production could make people more aware of their energy use. Even where community control of water was seen as negative due to the pressure of conforming to community standards, it was seen as educating community members about water scarcity.

However, in terms of governance there was a tension between this preference for localism and a belief in government oversight and regulation. Many participants did not trust community-led schemes to self-regulate effectively, believing overarching governance was needed. Highly de-centralised governance was thus sometimes seen as unrealistic. They also thought government was best at providing a safety net for the less fortunate, whereas a more localised system could see some communities much worse off than others. Given the importance of equality as already noted, the role of government in working to reduce inequality was seen as crucial.

In general, participants also struggled to imagine themselves living in futures which were too removed or different from today's reality. This idea was very prominent in the case of the NHS where loss aversion was an overriding driver. Participants did not like futures where healthcare services were provided through other institutions, or which presented a changed version of the NHS, because they were very protective of the NHS being free at the point of use like today.

4.4 Grass roots innovation

There was support for anything that would encourage and allow local citizens to be a part of, or drive, innovation. Many felt that the people who are closest to the needs of a community are its members and ideas like 'innovation hubs' (part of Devolution Revolution) were held up as good examples of how citizens could be supported to come together and generate ideas for innovative solutions to the problems their community faces. The example of 'energy gardens' which combine energy generation and community farming were also perceived as good ideas for helping local communities to use technology to build community ties. These were also mechanisms by which some thought that local areas could build pride in their area, as well as encourage community cohesion.

There was also backing for making more of the skills and heritage within communities – for example many liked the idea of system integration that fostered artisanal skills or that showcased a community's heritage.

4.5 Technology vs social interaction

The tension between technical advancement and the drift away from face-to-face interaction was a trade-off articulated during many discussions. Whilst in some cases participants thought that technological approaches could save time and resources, for example remote diagnostics in healthcare, in general they strongly resisted a move to online-only service delivery. A world where interaction is conducted predominantly online was seen as less sociable and less meaningful (and in certain cases, such as health diagnostics and education, less effective) than face-to-face. This was particularly the case for delivery of healthcare, for which there was strong resistance to it being primarily delivered remotely. There were also

concerns that citizen's social skills and mental illness could worsen as a consequence of a society where people are more physically separated.

4.6 Technology that is not obtrusive

Participants stressed the importance of choice in how they use, see and are affected by technology. This applied to the use of smart devices such as health monitors and household appliances, with many wanting to be able to ignore or turn off the interactive functionality of these. Although many participants could see the efficiencies these could bring, some were uneasy with the idea that this kind of technology could take away many of the simple decisions we make, thereby making life duller and too dictated by technology and habit. While these applications were not considered negative overall, the one common desire was for freedom of choice in how they could be used.

Similar sentiments were expressed in relation to the pervasiveness of technology. Participants felt that there was a risk that new technologies such as drones could become too common and that distributed sensors could certainly improve the 'usability' and efficiency of the city, but should not be too intrusive to daily life. There were also worries that the application of technology like distributed sensors could evolve over time to become unavoidable. In response to this, participants called for transparency in what the technology would and would not be used for.

4.7 Security and reliability of data and technology

Many of the futures discussed involved more technological approaches to delivering goods and services than we see today. This was often associated with increased data sharing. Participants were often grudgingly accepting of this, seeing it as the 'way things are going'. Nevertheless, they sought reassurances. They were generally content to share personal data about health or travel with government, for example, but only if it would mean a better service. Views on sharing of data relating to the waste system were less positive, many participants believing the drawbacks outweighing any limited benefit they might gain from it.

There were also greater concerns about private companies accessing their data, such as insurance companies who may use this data to increase their premiums. Participants were also particularly concerned about sharing their children's data. Several participants were also worried about the security of this data, fearing vulnerability to cyber security threats – most felt that this would be an ongoing problem that they would need reassurances about. More broadly, some participants wondered if a future which is more dependent on technology would be vulnerable to this technology malfunctioning. Increasing use of technology and data sharing were not necessarily opposed, but on the basis that there were clear guidelines over ownership of the data, what it would be used for and by whom.

4.8 Protecting the environment/ resource efficiency

Many participants thought that sustainability will be more important in the future, and this was important in determining their reactions to the futures presented. For example, it was generally recognised that our current dependence on fossil fuels is not sustainable. Participants therefore favoured a future where there was greater use of renewable energy than is the case at present. Similarly, there was a fair amount of support for either reducing our dependence on cars, or other futures where car use remained high but the vehicles were less environmentally damaging.

Discussion of waste revealed that many participants thought that we could do a lot more to reduce waste and use resources more efficiently. They were therefore often supportive of future worlds where products were built to last or more was

recycled. In some examples the burden in terms of sorting waste for recycling was high but this was not a barrier, suggesting being more resource efficient is important even if it takes up time that could be used for other activities.

4.9 Innovation that supports socialising, art and culture

Much of the information about the systems focused on the mechanics of service delivery and ensuring productivity. However, in the future city visions that integrated these systems participants also valued space for art and culture. They were less favourable towards futures that were focused purely on being productive but without scope for more creative activities.

4.10 Retaining the naturalness of food

Responses to the food outcomes and the developments in the food sector presented in the scenarios showed that food was the system citizens found it hardest to imagine innovation in. Developments such as meal replacement shakes, synthetic meat and 3D printed food were generally considered as unnatural and taking away too much of the wider benefits - enjoyment, the social aspect, heritage and providing a connection to the natural world - of food. Discussion around these areas of innovation suggested that participants could not see the reason why the food system needed to change, in the way they generally could for the other systems. While participants could understand that the health, energy, waste, transport (and to a lesser extent water) systems could be made more efficient with innovation, the drivers for change were perceived to be less clear for food. Participants also voiced fears that such developments would remove the connection we have with the source and processing of our food, something that was considered to be getting worse.

The findings of this dialogue show that participants support the idea of our cities becoming more integrated and see some of the benefits that this would bring for citizens. However, it will be necessary to clearly articulate the benefits to citizens if integration is to occur effectively. There is interest in the process of how our cities encourage and make use of innovation, and appetite for citizens to have a voice in this process. This dialogue shows that citizen perceptions and fears of how system innovation and integration might occur would need to be taken into account to increase the likelihood that they meet the needs of citizens.

Appendices

The following appendices include stimulus materials used as part of the dialogue workshops and online community. Due to the quantity of information contained within these, they are presented as separate files. We list below the appendices, along with a brief description of them and their purpose.

5.1 First event materials

5.1.1 Welcome presentation

Innovate UK and Ipsos MORI gave a brief presentation to introduce participants to the project and Innovate UK, and explain what the day would entail.

5.1.2 Discussion guide

Ipsos MORI developed this outline of the day for facilitators and note-takers. This set out each section of the workshop, including key questions, probes, stimulus materials used and exercises.

5.1.3 Driver cards

Each card included an explanation of one of 10 drivers of change that we can expect to be important in shaping our future cities. They also included examples of the change and its possible impacts.

5.1.4 System posters

For each of the six systems, a poster designed by an illustrator showed how the system operates today, with text explaining how it is regulated and paid for, and likely future challenges this system might face.

5.1.5 Outcome cards

Ipsos MORI, in collaboration with Forum for the Future, created 21 outcome cards, three or four for each of the six systems. Each outcome represented a possible future of that system, summarising how it operated, who runs it and how, how we pay for it, and the main challenges the system faces.

5.2 Summit materials

5.2.1 Welcome presentation

Innovate UK and Ipsos MORI gave a brief presentation to briefly recap the first events, and explain the purpose of the summit workshop.

5.2.2 Discussion guide

Ipsos MORI developed this outline of the day for facilitators and note-takers. This set out each section of the workshop, including key questions, probes, stimulus materials used and exercises.

5.2.3 Street scenes and timelines

For each of the three scenarios devised for the summit, there was a large poster which included a 'street scene' showing what the world looked like and key facets of daily life, as well as systems integration. We also used a timeline to show how the scenario developed from the present day.

5.2.4 Participant handout on street scenes

This included further detail on each scenario in terms of how each of the six systems operated, key integration and technology examples, and any other aspects of life in that scenario that would not be immediately obvious from the poster.

5.2.5 Technology cards

Ipsos MORI and Forum for the Future developed ten cards with a photo and brief explanation of technologies that may be important in a future world, providing more detail than had been included in the street scenes and handouts.

5.3 Online community materials

5.3.1 Technology cards

These are the same as those used in the citizen dialogue workshops.

5.3.2 Outcome cards

Ipsos MORI developed simplified versions of the outcome cards used in the dialogue workshops so they could be presented to community members. The outcomes were presented by stems, with each outcome for a system presented on one sheet, including an overview, a description of how the system works and how we pay for it.

5.3.3 Street scenes

Ipsos MORI created versions of the street scenes used in the dialogue workshops, including text boxes drawing out the main information presented visually within the image. For instance, the use of technology within the system or examples of how integration was occurring between different urban systems.



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About Ipsos MORI's Social Research Institute

The Social Research Institute works closely with national governments, local public services and the not-for-profit sector. Its c.200 research staff focus on public service and policy issues. Each has expertise in a particular part of the public sector, ensuring we have a detailed understanding of specific sectors and policy challenges. This, combined with our methodological and communications expertise, helps ensure that our research makes a difference for decision makers and communities.