Department for Science, Innovation & Technology

Public Attitudes to Connected Places

Research Report

January 2024

Pye Tait Consulting
info@pyetait.com
www.pyetait.com

Certificate Number 10745

Contents

1. Executive Summary

About the research

DSIT commissioned Pye Tait Consulting to explore and understand public knowledge, attitudes and confidence levels relating to connected places technologies, identify key concerns and how they could be addressed. Outputs from the research including two visual explainers (video and infographic) that were audience tested, as well as a local authority communications and consultation guide.

The research was delivered by engaging with 37 members of the public, spanning a diverse range of characteristics and secured through a reputable research panel. The research involved an initial online survey, two rounds of virtual focus group activity, and 1:1 interviews with a sub-set of participants with physical or mental health conditions.

Key findings

Common perceived benefits of connected places technologies among research participants relate to the potential for improved convenience, more effective monitoring and response times where there are problems (notably in the health and care sector), and providing environmental benefits. A minority made the point that technology proliferation is inevitable and should therefore be embraced.

The majority of participants expressed concerns about transparency relating to connected places technologies, such as how it is being implemented, what it includes, who will have access or be in control of the resulting data, what types of data will be held and why. Around a third raised of participants raised concerns around how securely data are held, how securely their privacy is protected, and the associated costs involved.

These various concerns signal a lack of confidence in the deployment of connected places technologies, further exacerbated by not knowing which specific technologies are already being used in their own communities and if they are being used safely and securely.

As part of the research Pye Tait Consulting developed and audience-tested two visuals aimed at members of the public. These included a video and infographic to explain connected places technologies, and to summarise and respond to broad groups of questions or concerns raised during the research. In the video these were grouped as data security, data privacy and human safeguards.

Overall, participants found the draft visuals to be clear, easy to understand, educational, informative and accessible. However, many remained sceptical about connected places

technologies, particularly around how their data are (or might be) used, how securely it is stored, and whether they can really trust organisations in charge of it.

Research participants would like local authorities to better inform them about the local implementation of connected places technologies, including timescales and costs. This is considered especially important given that they appreciate the tightness of local budgets and potential for impact on other local services. They would also like more reassurance that potential unintended consequences have been worked through.

Furthermore, most participants would like to be involved – in some form – in the development and implementation of connected places in their communities, in the interests of transparency and to bring communities on board and with their consent.

To fully respond to these concerns, local managers of connected places technologies clearly have a key role in engaging with their communities. This process can be aided by the local authority communications and consultation guide, developed by Pye Tait Consulting as an additional output to this research. It aims to help local authorities engage with members of the public on the topic, respond to the issues raised and deliver connected places as effectively as possible with the trust and buy-in of their communities.

DSIT may wish to consider adopting the following recommendations:

1. Better enable managers of connected places to engage more effectively with their local communities on matters of public interest, particularly relating to connected places technologies.

2. Encourage managers of connected places to pursue their connected places journey and be more proactive in identifying ways to overcome barriers that they may face.

3. Consider developing a central repository of tools and resources relating to connected places technologies that are aimed at members of the public, especially where their local authority may not have clear, outward facing information.

1. Background

2.1. What is a connected place?

"A **connected place** is a community that integrates information and communication technologies and Internet of Things (IoT) devices, to collect and analyse data to deliver new services to the built environment, and enhance the quality of living for citizens."

National Cyber Security Centre (NCSC) and Centre for the Protection of National Infrastructure (CPNI)

Connected places can provide a range of functions and services to citizens, such as improving safety, providing environmental benefits, making public services more efficient and accessible, and – through doing so – boosting productivity and creating jobs.

The most well-known connected places are 'smart cities'. In the UK, London was one of the earliest innovators through its Oyster Card ticketless transport system, while Birmingham, Manchester, Cambridge, Bristol, Glasgow and Edinburgh are now recognised for their ground-breaking initiatives and thriving technology clusters and ecosystems.[1]

2.2. About connected places technologies

A connected place uses technologies such as a system of sensors, networks and applications to collect data to improve its operation. These technologies also help to develop public spaces by allowing managers of connected places to understand and evaluate changing demands and needs in infrastructure.

Specific technologies in the connected places ecosystem may be grouped as follows:

- Internet of Things devices (sensors and actuators) in a place-based context
- Networks for data transmission, including WiFi, mobile networks, Bluetooth and IoT networks
- Data aggregation for visualisation and insight
- Whole stack solutions (e.g. across all the technologies involved in the delivery of connected places)
- Consulting, strategy and managed services

[1] Department for International Trade (2020) UK Smart Cities Directory

Managers of connected places commonly include (but are not limited to) local authorities, but also regional government, transport authorities, planning authorities, energy departments, smart ports, smart campuses and smart airports.

Examples of functions ('use cases') supported by connected places technologies may be grouped as follows:

Critical infrastructure and utilities

This may include technologies such as crowd monitoring, to provide people with information on busy and quiet periods in town centres, or the use of smart local energy systems to reduce pressure on the grid.

Built environment efficiency and safety

The built environment may include such technologies as systems to monitor energy efficient street lighting, waste level sensors within public bins to better inform pickup schedules, and potentially facial recognition cameras that help to identify criminals and find missing persons.

Social care, health and wellbeing

To encourage safer living conditions for the more vulnerable, temperature and moisture sensors could be installed in housing, so that local authorities and care home managers can monitor and improve living conditions. Similar sensors can be used to help protect those in assisted living conditions, as they may be able to detect accidents and improve emergency response times.

Environmental monitoring

To monitor potentially high risk environment areas, water level sensors may be implemented to relay important information about flood risks. Additionally, air quality monitoring could be undertaken to provide people with clean air walking routes around their local area.

Transport and new mobility solutions

To improve upon transport and commuting, the installation of smart traffic light systems could ease congestion on busy roads, and car parks monitoring could indicate the level of free spaces. Additionally, futuristic air transport solutions could be implemented, such as drones to make home deliveries or transport medical supplies to those who may have mobility issues.

NB: For the purposes of this research, the following are considered **out of scope** of connected places technologies:

- Technologies that target consumer use, such as smart TVs or smartphones, and enterprise use such as smart printers or CCTV facilities in shops

Local authorities are increasingly integrating connected places technologies within their public spaces, leading to a greater collection of public and personal data. Furthermore, the technologies and devices that the infrastructure relies on can move, process, and store sensitive data which makes it an attractive target for cyber attacks.

2.3. DSIT and NCSC's role in relation to connected places

The government's Department for Science, Innovation and Technology (DSIT) is responsible for encouraging the secure and sustainable deployment of connected places technologies across the UK. Its policy work includes providing appropriate guidance and support to customers and suppliers of these technologies, for example to help make systems more resilient to cyber threats.

DSIT and NCSC provide guidance and support to managers and suppliers of connected places technologies, for example via the following resources:

- Connected Places Cyber Security Principles
- Secure Connected Places Playbook

This includes cyber security guidance designed to cover aspects such as:

- Understanding potential risks of a connected place
- Having in place good cyber security governance and skills
- Being careful when working with technology suppliers
- Understanding legal and regulatory requirements
- Ensuring technologies are not exposed to easy attack
- Monitoring for any data leaks or attacks to act quickly

2.4. State of local connected places governance

In 2022, Pye Tait Consulting surveyed 188 managers of connected places across the UK for DSIT[2], comprising mostly (but not exclusively) of local authorities. The findings identified surveyed organisations to be at various stages of their connected places journey, facing a range of different barriers and with varying levels of confidence in managing cyber security risks.

Based on Table 4 in the report (maturity groups):

[2] Pye Tait Consulting (2022) Surveying UK Connected Places

- Just over a quarter of all surveyed organisations (27%) said they had a connected places strategy in place **and** managed associated technologies
- Just over a quarter (26%) said they did not have a strategy in place but were already managing connected places technologies
- More than a third (39%) said they had the ambition to manage connected places technologies in the future
- The remaining 8% said they had no such ambition.

The following findings from the report relate to all surveyed organisations (local authorities and non-local authorities).

With respect to public engagement, the survey explored how organisations were engaging with individuals in their local areas to consider their needs and inform connected places development. The most mentioned approaches were online consultation activity, followed by citizen face-to-face focus groups, public events and/or debates, and conducting telephone interviews.

In terms of barriers faced in deploying connected places technologies (Figure 17), the most mentioned were lack of funding and lack of resource/capacity (19% share) and lack of skills/technical expertise (12% share).

Surveyed organisations already delivering connected places technologies, were asked how confident they were in being able to identify and manage cyber security risks (Figure 26, Base 98). The majority (79%) said they were either very or quite confident, while a fifth (20%) said they were not very confident.

When asked whether they had considered cyber security risks in their connected place ambitions (Figure 34, Base 73), less than half (40%) said yes and that they had sufficient understanding of the risks; 43% said yes but that they did not have sufficient understanding of the risks; and 18% answered no.

2.5. Existing evidence of public awareness and understanding

A systematic literature review published by the *PETRAS National Centre of Excellence for IoT Systems Cyber Security* in 2023[3] found that the majority of the public is oblivious to connected places, which presents a passive threat of accidental damage and increased vulnerability to attacks oriented to social engineering that may damage the infrastructure of the connected place and data reliability.

In extreme circumstances, the public can become an active threat to the security and sustainability of connected places should they reject a connected place due to lack of trust or

[3] Joe Bourne et al. (2023) To what extent do public perceptions of connected places affect the security and sustainability of connected places? Literature Review

perceived invasion of privacy. This may manifest itself as low-skilled cyber-attacks, data obfuscation, or vandalism to hardware.

The PETRAS report added that models, policies and place managers' communication can be vital in shaping public perceptions of connected places, but that there is not enough evidence to provide guidance on which are most effective due to the lack of depth and transferability in current research and the complexity of the connected places landscape.

Research conducted in 2018 found that whilst the public may have limited understanding of connected places and how they operate, they are increasingly engaging with in-home smart technologies that utilise IoT and other similar technologies and devices, including WIFI, and sensors and actuators. The research found that people tend to become more interested in adopting these technologies when the developers incorporate their specific needs and concerns, i.e. involve them along the way.[4]

[4] Deepika Singh, et al. (2018) Users' Perceptions and Attitudes Towards Smart Home Technologies

2. About this research

By strengthening its understanding public awareness, attitudes, and levels of acceptance of connected places technologies, DSIT intends to further develop connected places programmes with managers of those places, and to help inform the public about the aims of connected places and associated technologies and security measures.

2.1. Research objectives

DSIT commissioned Pye Tait Consulting to:

1 Explore and understand public knowledge, attitudes and confidence levels relating to connected places technologies, including elements that are not well understood by certain demographics

2 Identify inherent public concerns about connected places technologies that may need to be addressed

3 Determine optimal ways of communicating with members of the public to address their concerns and provide appropriate reassurances

4 Create tools to help managers of connected places technologies better engage with members of the public about connected places technologies

5 Deliver research reports setting out the findings and recommendations

In addition to this research report, DSIT commissioned Pye Tait Consulting to develop the following tools and resources:

- Video and infographic explainers aimed at members of the public to help them better understand the features and benefits of connected places technologies, and to address key questions and concerns raised during the research

- A local authority communications and consultation guide for managers of connected places to support them in communicating concepts of connected places projects and their cyber security to the public

2.2. Overview of methodology

Research to inform this report and associated outputs involved 37 members of the public, spanning a broad cross-section of demographics and characteristics. The same participants were carried forward through multiple iterative stages of activity. Pye Tait Consulting designed the research and scripts, hosted the online survey and virtual focus groups, and

analysed and reported on the findings. Participants were sourced and recruited for each stage by Zest Fieldwork via its research panel.

In summary:

- All 37 participants took part in an initial online survey
- Sub-group 1: Of the original 37, a total of 32 were carried forward to take part in two rounds of onward focus group activity
- Sub-group 2: Of the original 37, a total of 5 were carried forward to take part to two rounds of 1:1 interviews

More about sub-group 2:

The 1:1 interviews represented an added value component of the research to ensure the views of those with physical or mental health conditions were sufficiently explored. Note that the focus groups also involved other individuals with physical and mental health conditions.

Individuals identified as having a physical or mental health condition (based on criteria set out below) were offered the choice of taking part in either virtual focus groups or 1:1 interviews.

Sampling continued until all available places were filled for the focus groups and 1:1 interviews, thus ensuring – as far as reasonably possible – that the research reflected a range of diverse perspectives and needs.

Overview of research stages:

- **August 2023:** Initial online baselining survey designed, facilitated and analysed by Pye Tait Consulting, and distributed by Zest Fieldwork to a sample of selected panel members (all 37 participants)
- **September 2023:** First round of four virtual focus groups to gauge public attitudes and perceptions of connected places technologies (subset of 32 total participants)
- **September 2023:** 1:1 interviews with individuals with physical or mental health conditions to explore the same topics, along with additional accessibility considerations (subset of 5 participants)*
- **October 2023:** Development of the draft video explainer (via video production company Makematic) and draft infographic explainer

- **November 2023:** Second round of four virtual focus groups (November 2023) to gauge views on draft engagement tools (video and infographic) and to explore communications needs around connected places technologies (30 out of 32 total participants carried forward from the first round)

- **November 2023:** Repeat 1:1 interviews with individuals with physical and mental health conditions to explore the same topics, along with additional accessibility considerations (subset of 5 participants)*

Further details relating to sampling and methodology can be found in the accompanying Technical Report.

2.3. Strengths and limitations of the research

The research involved participation from diverse sample of members of the public, collectively demonstrating a range of demographics and characteristics. This was important to take into account attitudes towards connected places that might be shaped to varying extents based on different backgrounds.

Through multiple iterative stages of primary research, the same participants were carried forward, with only two participants not being carried forward between the round 1 and round 2 focus groups, therefore limited attrition. This approach meant that – as the research progressed, it was possible to audience test draft outputs (infographic and video) in terms of how well they responded to points raised previously.

Other strengths of the research were its primarily qualitative approach, enabling deep drive exploration and audience testing, as well the use of a research panel to recruit participants, which proved essential to achieve diversity and recruit under tight timescales.

The main limitation of the research is the relatively small sample, meaning that points and concerns raised about connected places technologies, along with views on the draft infographic and video, can only be indicative of the wider population. As such the research methodology did not aim to achieve statistical robustness.

The panel approach also has a limitation in that participants are offered a financial incentive to take part, meaning that there is a risk that some might take for that reason. It should be noted that the incentive was considered fair and proportionate to the research demand and its absence would have prohibited recruitment of a diverse sample at pace. Furthermore, expert and professional facilitation of the research sought discussion and debate from all participants on a topic that has relevance to people's local communities.

2.4. About this report

This report sets out the main findings from the primary research relating to public knowledge and attitudes towards connected places technologies. Note that whilst this report

summarises the results of audience testing of the draft video and infographic explainers (which took place during the second-round focus groups and interviews), it does not include itemised lists of requested changes, which were discussed and agreed between Pye Tait Consulting and DSIT.

3. Public Knowledge and Attitudes – Baseline

The initial online survey of 37 members of the public explored:

- Prior familiarity with 'connected places' and 'smart cities'
- Extent of favourability towards particular connected places technologies
- Main concerns about connected places technologies and data
- Gauge of participants' level of technology understanding/IT literacy[5]

Prior to taking part in the research, only a small minority of participants had heard of the term connected places (16%) compared to a large minority that had heard of 'smart cities' (43%).

At the initial survey stage, participants were more favourable towards the use of Internet of Things (IoT) sensors, along with technologies and services that gather data and insights, than they were about artificial intelligence (AI) enabled technologies. This indicates a sense of caution around early impressions of AI.

Table 1: On a scale from 1 'fully against' to 10 'fully in favour', how do you feel about each of the following in public places?

Types of technology	Mean	Mode	Range
Internet of Things (IoT) sensors that collect data such as footfall (how many people pass through a particular area) and air quality	7.3	8	1-10
Technologies and services that gather data and insights, such as smart meters/smart local energy systems	7.1	8	2-10
Artificial intelligence (AI) enabled security cameras, for example to monitor traffic or anti-social behaviour	6.4	5	2-10

Base: 37 respondents

As a high-level initial gauge of potential concerns about connected places technologies, participants giving a rating of 6 or below were asked for the main reason for their rating.

[5] The results from this question are set out in the accompanying Technical Report.

The following main themes arose where a rating of 6 or below was given in relation to: **IOT sensors that collect data such as footfall (how many people pass through a particular area) and air quality.**

- Lack of knowledge about big data
- Data reliability
- Privacy concerns
- Risk of data being used for illicit purposes, including potentially by foreign powers
- Technology advancing at a faster rate than humans can keep up with
- Lack of trust in non-human data collection

The following main themes arose where a rating of 6 or below was given in relation to: **Technologies and services that gather data and insights, such as smart meters/smart local energy systems:**

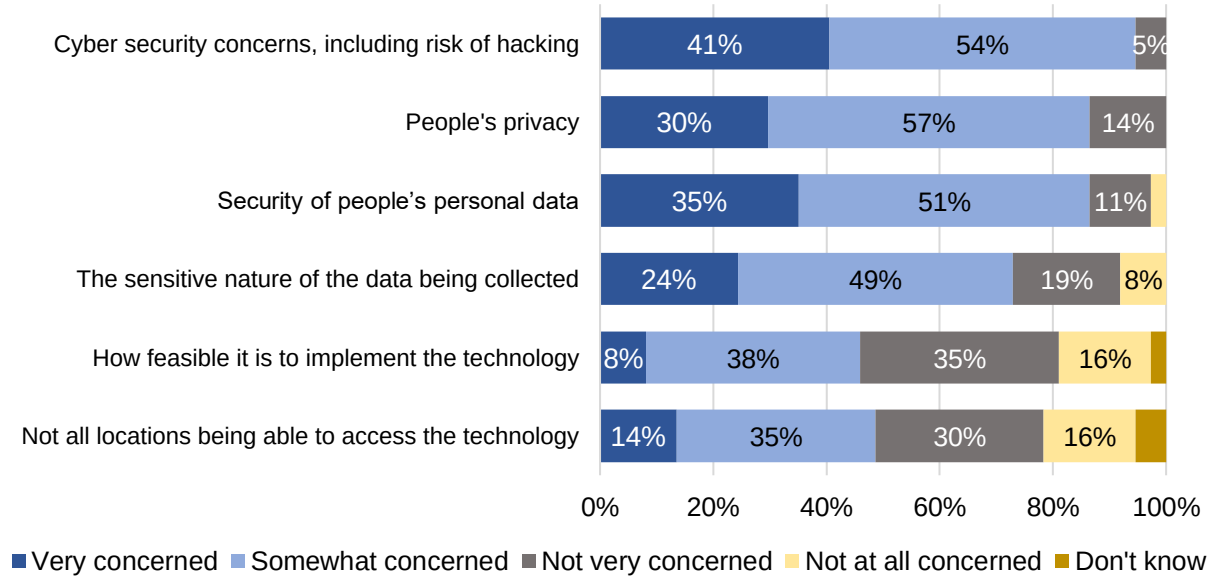
- Big Brother effect
- Data reliability
- Data security
- Privacy concerns
- Negative unintended consequences of insights e.g. increased footfall could lead to higher prices

The following main themes arose where a rating of 6 or below was given in relation to: **AI-enabled security cameras.**

- Data in the hands of the wrong people
- Data security concerns
- Privacy/identity security concerns
- Big Brother effect/perceived surveillance – even if not intended
- Reliability of AI
- Insufficient knowledge of AI and potential negative unintended consequences
- Risk of problems and errors from humans not being in control/having oversight
- Evidence of lack of trust in non-human data collection

At the initial survey stage, participants' strongest levels of concern around connected places technologies and data related to cyber security (95% concerned), privacy (87% concerned) and security of personal data (86% concerned).

Figure 1: Please tell us your level of concern regarding each of the following when thinking about connected places and the types of technologies involved.



Base: 37 respondents

4. Public Knowledge and Attitudes – Deep-Dive

The first round of focus groups and 1:1 interviews explored:

- Participant understanding of connected places technologies and broad sentiment
- How these technologies play a part in people's everyday lives
- Specific benefits and risks/concerns felt by participants
- Types of data people are especially concerned about

4.1. Understanding of connected places technologies

Participants were presented with an overview of connected places technologies and examples of use cases. This was intended to be sufficient to ensure understanding of the scope but without intending to be leading.

This led into a discussion to gauge participants' reactions to those technologies, their own suggested use cases, and views on how these types of technologies can play a role in people's lives. This helped to build participants' grasp and engagement with the topic.

Participants recalled a range of use cases from those mentioned by the facilitators. In doing so, they outlined how they can play a part in people's lives and their broad sentiment towards those technologies (16 positive, 8 neutral, 5 negative and 3 uncertain).

Some participants also gave their own suggestions of use cases, although many found it hard to think of examples, which provided further evidence of a lack of familiarity with the concept of connected places.

Those with mixed opinions expressed a lack of confidence about what connected places technology involves and how data are used.

The following are the main technology 'use cases' mentioned by participants, including their perceived role and potential benefits/issues:

Security cameras, notably facial recognition cameras: Positive role in speeding up emergency service response times, identifying suspected criminals, reducing crime rates and helping to identify missing persons. Concerns raised about 'Big Brother' style impingements on privacy and perceived unnecessary nature of personal data collection using this technology.

Smart traffic light systems: Positive impact for day-to-day travel and convenience stemming from their role in easing congestion.

Smart detectors to monitor public bins: Perceived as a positive where "bins are always overflowing".

Sensors to measure moisture, air pollution and flood levels: Could improve quality of life for citizens, particularly those in vulnerable environs.

Sensors to help with assisted living, e.g. in social housing: Can mean issues such as damp/mould are detected more quickly and progressed for action.

Drones for package deliveries: Could help those with reduced mobility and improve access to healthcare.

Smart transport systems: Could provide safer and more mutually supportive travel environments, e.g. variable smart speed limits outside schools that switch off during the holidays.

"A lot of this tech is around already, but the general public doesn't know anything about connected places and smart cities."

4.2. Main perceived benefits of connected places technologies

Common perceived benefits relate to improved convenience, more effective monitoring and response times where there are problems, and environmental benefits. A minority made the point that technology proliferation is inevitable and should therefore be embraced.

Set out below are the main perceived benefits of connected places technologies raised by research participants:

Transport: Being able to conveniently map travel times, navigate large areas, avoid congestion, improve public transport connectivity and routes, and monitor car park capacity.

Environment: Helping local authorities to implement climate change prevention measures, provide better information on clean air walking routes, more timely bin collections, improved flood warning systems for residents in high-risk areas and linkages to smart drains to divert flows.

Social care: Increased independence for vulnerable individuals, greater peace of mind for families of vulnerable individuals, improved medical access for those with limited mobility, improved social links for more isolated members of society, and better monitoring of airborne diseases.

Tackling crime: Use of cameras for monitoring crime hotspots, reducing future incidents and improving the overall safety of communities.

Footfall: Monitoring best times to shop and providing convenient shopping times for individuals who experience social anxiety.

"Facial recognition sounds similar to the CCTV we already have. Why not have it in modern tech? In terms of safety, it can help with emergency response."

"I work in healthcare and the biggest benefit I see [from connected places technologies] would be faster responses in emergency situations and quicker monitoring of people that need help in their homes. Some people don't have access to phones, but this tech might help them be monitored and send a paramedic."

"I feel safer. I think it's inevitable with all the advancements we have that we have to give up on privacy in some level."

Perceived benefits of connected places technologies for those with physical or mental health conditions are as follows:

The 1:1 interviews among a small sample of individuals with physical or mental health conditions identified the following benefits and opportunities associated with connected places technologies:

Firstly, there is a potential role in improving the efficiency and efficacy of emergency services, for example through shared information about people's conditions; fast-tracking medications where necessary; and considering how access to prescription medication could be made easier for people who are less able to easily access healthcare services;

Secondly, there could be advantages of sharing footfall monitoring information more widely among the public, for example to help people keep abreast of busy periods they might want to avoid in shopping areas, especially where they struggle with crowds and noise;

Thirdly, improved information about public transport and numbers of passengers versus seating capacity, which could benefit those who suffer from physical disabilities so they can more accurately plan their journeys.

4.3. Main perceived concerns around connected places technologies

The majority of participants expressed some form of concern about transparency relating to connected places technologies, e.g. how it is implemented, what it includes, who will have access or be in control, what data will be held and why. Around a third raised concerns around how securely data are held and associated costs – indicating that the issue is more about lack of current understanding, leading to lack of trust.

Set out below are the main perceived concerns of connected places technologies raised by research participants:

Cyber security: Key questions raised included **"**are data kept safely?" and "what are the storage risks?" Several participants felt that large organisations and local authorities are especially vulnerable to data leaks and cyber attacks/hacks.

Privacy: Concerns were raised about smart cameras, whether it is ethical to monitor people going about their daily business, and the risk of profiling errors where the technology might struggle with darker skin tones.

Transparency: Concerns were raised that members of the public have not been/may not be informed about technology implementation and how data (especially personal data) are collected, monitored and stored.

Managers of the technology: Trust issues arose, along with concerns that data may be utilised for nefarious purposes or sold on, with some participants questioning whether this could lead to more targeted email scams.

Effective use of data: Questions were raised about how local authorities use the data they receive, e.g. to tackle criminal activity, pollution and social housing issues. Some participants felt that local authorities are not being clear enough about how they use data.

Smart motorways: Concerns replicated prominent issues in the media. e.g. the loss of a hard shoulder potentially leading to a greater risk of accidents where vehicles break down.

Job displacement: Concerns were raised that new technologies could lead to the loss of local jobs in local communities.

Fail safes: Questions were raised on what contingencies exist in people's own local areas should technologies fail.

Costs: There was some scepticism among participants as to whether local authorities have the financial resources to implement connected places technologies and be able to implement data security measures needed. Concerns were raised that local authorities could use taxpayer money to implement technologies without being fully candid about spend and trade-offs, e.g. impact on priority services. Some participants would like clarity as to whether

the implementation of connected places technologies would impact council tax, while one individual was of the view that money would be better spent elsewhere.

Some focus group participants were not particularly concerned about types of data that connected places might gather as they feel the data are "out there anyway".

For these participants, there is a sense that if an individual has not done anything wrong or harmful, there is no reason to be concerned; furthermore, that most data are likely aggregated and anonymised to be useful, e.g. footfall.

However, there are concerns around sharing of sensitive data, such as relating to medical records, and mixed views on targeted advertising, especially based on data they feel may have been gathered without explicit consent, such as based on location tracking and where people shop.

Finally, where people felt that their views about connected places had changed in recent years (more positive or more negative), this largely appears to relate to the proliferation of technology in their everyday lives bringing either improved social outcomes or causes for concern, e.g. data security and privacy.

"My biggest concern is how the data will be stored and the confidentiality of the info. It's all about privacy and confidentiality."

"Where does our data go? How is it used? Will it be abused or sold on? It's about the content and how it's utilised. I've got issues with personal data being collected – I get spam calls and emails, so I know it would be frightening if my data were sold even further."

"As far as facial recognition goes, why do they need to do this? I'd want to know why and how that data is stored and for how long."

"Where does it all stop? How far is too far?"

Perceived challenges associated with connected places technologies for those with physical or mental health conditions are as follows:

Whilst sensors could help to detect problems in social housing, for example mould, there is a concern that this does not necessarily mean action is going to be taken by local authorities

to address those issues – making it important that data collection will ultimately translate into positive outcomes.

Some people could find it difficult to fully understand connected places technologies – making it important that basic information is presented clearly and in an accessible way, e.g. by local authorities.

There is a concern that connected places technologies could exacerbate feelings of social isolation where people are encouraged to make more use of digital rather than in-person services – especially where those in-person connections are a valuable part of everyday life.

Trust and buy-in to new technologies could be more difficult to garner among more vulnerable community members.

5. Public Views on Connected Places Management

In relation to connected places management, the first and second round focus groups and 1:1 interviews explored:

- Public trust of those managing connected places
- Information that would be useful from local authorities relating to new/existing projects
- Factors to help inform future information resources and to frame appropriate reassurances
- How/extent to which individuals would like to be involved in how connected places are designed and what technologies are used within their communities

5.1 Trust of technology managers/suppliers

Most participants indicated that they do not fully trust local authorities or private companies to keep their data secure, with mixed views on which of these two categories of organisations they trust more.

"Data are managed by people whichever organisation they're part of, and people are prone to making mistakes."

Those more trusting of local authorities consider them more likely to "stick to the rules", an that private companies are potentially more strongly motivated by profit and more likely to "sell people's data."

Those more trusting of private companies consider them to have more specialised skills in data management and security, or that local authorities could be more inclined to sell people's data to raise money given stretched budgets.

A small number are not particularly concerned either way, noting their awareness of legal protections such as GDPR "which are there for a reason."

Some participants, including those of different age groups, raised the point that there could be a generational divide at play where older people are perceived as being more trusting of people than they are of technologies. At the same time, they consider younger people to be more active users of technology in everyday life, therefore building up an indifference to being monitored.

"It's a 50-50 thing. I wouldn't say 'trust'. I'm apprehensive. They haven't done something that makes me say 'wow, I really trust you', neither have they done anything to make me distrust them… I'm sitting on the fence. Trust is something that has to be earned."

"We need to know about oversight of different suppliers being used. We need to make sure we are getting the right people for the job."

"I think if a company wanted to reassure us that the data is safe, they could tell us about their track record of handling data. If they've had breaches before, that's not going to paint them in the best light. If they can show they can walk the walk, that would be helpful."

5.2 Implementation of technologies – key considerations

Participants would like local authorities to better inform them about the local implementation of connected places technologies by:

- Demonstrating the "need" for connected places technologies in the community
- Setting out the proposed benefits comprehensively and convincingly
- Making clear who is involved in managing connected places technologies in the community, including suppliers/third parties
- How connected places are financed and what the money is specifically being used for
- Explaining everything salient about data management
- Gauging public opinion on proposed technologies, for example through public consultations
- Keeping the public informed about developments
- Running pilots/trial of untested technologies so they are fully open to public scrutiny
- Prioritising cyber security and ensuring robust data security systems are in place

"I would like [managers of connected places] to demonstrate there's a need for this in the local community. Financially, there are constraints on public funding. I want to know this isn't fanciful. So what are the needs and benefits? They are responsible to the public at the end of the day. if they want people on board, information is key, and they need to take feedback on board."

"We need information to understand it a little more. For the likes of my children, the tech will become greater and greater so having more information to hand would be quite useful."

"How is it going to be introduced? Phased in? Will there be trials?

"One concern is where are they going to get all the money from? It won't save more money than what it costs, I don't think."

5.3 Content of information resources – key considerations

When thinking about possible future information resources that could be issued by managers of connected places technologies, participants would like to see the following made clear:

- Purpose and benefits of connected places technologies, i.e. what they offer
- What types of data are collected and how
- Where technologies are implemented in the community
- Reassurances that potential unintended consequences have been worked through
- How technologies are tested
- Programme and timeframes for local implementation
- Tailored information for those in remote areas that may not to have as wide a scale of technological implementation

Many participants feel it is important to have a holistic appreciation of cyber security – "what, when, why, how, who?" – to include how data are stored, for how long, how secure it is and what happens in the event of a breach.

"When you're talking about people having falls, how is that going to be responded to and by whom? Crowd monitoring - what information is that going to give us to improve the service we get? What are we going to get out of it?"

5.4 Delivery of information resources – key considerations

Participants raised the following considerations, which they feel should be borne in mind by managers of connected places technologies with respect to sharing information with the public:

- Information could be provided through a range of media, e.g. post (letters and brochures), online (emails/videos), public awareness campaigns, posters/billboards, in-person engagement events, educational tools and reports
- Transparency is key, therefore it is important to have as much information about what is happening in a particular community as possible
- Information should take account of accessibility needs and community diversity, e.g. more elderly people might not be as adept at accessing online materials
- Information can easily be overwhelming, so it is important to be easily accessible and not too technical
- There should be a dedicated local authority contact point, who could be on-hand to answer questions

Some are not sure that any amount of information would alleviate concerns, especially as there is "always an element of uncertainty" and "as data security advances, so does the capability of cyber criminals".

"Make sure people know what's happening. Use normal conversations to tell people. Dumb it down for people so that people aren't just hit with terms and conditions."

"Assessments, consultations, cost/benefits. trial runs. That sort of thing."

Additional design considerations for those with physical or mental health conditions:

- Making sure information about connected places is presented in simple terms for those who are less familiar with technology
- Information should be easy to understand and written with accessibility in mind
- There should be a way of requesting further information/seeking clarification, e.g. from the local authority
- Local authorities should have dedicated professionals available with specialist knowledge of accessibility needs to answer specific questions from members of the public

5.5 Public involvement in developing connected places

Most participants would like to be involved – in some form – in the development and implementation of connected places in their communities.

Some feel this is important to ensure transparency, while others emphasised that the public's consent to implementing such technologies is very important.

Participants expressed interest in becoming involved in the following ways:

- The opportunity for direct involvement – either by helping to test technologies, or being able to see what happens "behind the scenes"
- Some form of public consultation, to gauge opinions, buy-in and consent
- Public involvement in local authority meetings
- Implementation of a citizen's representative body, to coordinate opinions and public priorities

"It's important for people to be involved in terms of feedback and accountability. The community needs to be involved and informed, when these things are going to happen, especially for people don't have access to computers at all."

"I would like to be involved but I don't know how much wright my voice would carry."

"It would be helpful to have more information to the differences between localities in their adoption of connected places technologies. Also, is there a timescale for this as well?"

6. Responding to Public Questions and Concerns

6.1 Visual explainers

Between the two rounds of focus groups and interviews, Pye Tait Consulting coordinated the development of a video and supporting infographic to explain connected places technologies.

The two visuals provided upfront information about connected places, including examples of technology use cases, then introduced key questions and concerns. In the video, these were presented in three groups, namely data security, data privacy and human safeguards. The infographic included sections titled ‘What about my data?’, ‘What about cyber security?’, and ‘What about who is managing the technology’?

The visuals then addressed the main questions and concerns using various information and reassurances, including on aspects of law, standards and practice that managers of connected places are expected to follow, as well as links to additional resources.

The video used animation rather than live action since existing best practice indicates that this style enables concepts, complex ideas and relationships to be conveyed in a more straightforward way.

The visuals were designed to be complementary to one another and developed with the intention of being usable by managers of connected places technologies across the UK. As such, they needed to be necessarily high level and could not therefore provide specific information about what may or may not be implemented within individual communities.

6.2 Initial responses to the video and infographic

Overall, participants in the second round of focus groups and interviews found the draft resources to be clear, easy to understand, educational, informative and accessible. They considered the video to be engaging, well-paced and adopting of an appropriate style with its blend of animation, audio narration, on-screen text and music. A very small minority were not keen on the use animation and for that reason preferred the infographic.

The infographic was considered well designed and containing an appropriate amount of detail, although many felt that the second of two pages could be made slightly more succinct or with use of stylistic techniques to bring out key points. Some preferred one particular resource over another, which largely seemed to come down to personal preference for accessing information and guidance.

A range of specific change requests were noted for the two resources, including tweaks to certain messaging, graphics, particularly a need to articulate the benefits more clearly, besides the features, of connected places technologies. The resources prompted reflection

by participants on their original concerns from the round 1 focus groups, with many saying they still held on to those concerns, such as the perception of connected places being synonymous with 'Big Brother'. This largely appeared to come down to not knowing or being confident about what was happening in their own local area, which the resources were not able to explain. Some also had deeper concerns around the susceptibility of technologies to failure or cyber attack, and the potential consequences that might ensue.

"I thought [the video] was very educational, because it communicates and makes sense of the jargon.

"Overall, [the infographic] is very comprehensive and gives a lot of information. Trying to digest it, it's a big read."

6.3 How views changed or stayed the same

Most participants came away from the second round of focus and groups and interviews more informed about connected places technologies, for example being more familiar with the broad concept, technology use cases and the range of features and intended benefits. However, many remained sceptical, particularly around how their data are (or might be) used, how securely it is stored, and whether they can really trust organisations in charge of it.

Indeed, with additional knowledge and understanding came a recognition among most participants that they were not aware of how and the extent to which connected places technologies were already being deployed in their own communities and whether there is a plan and timescale for implementation. This indicated that they had not received or engaged with information or consultation activity from their local authority.

"I'm aware of advances of different technologies. I knew about bits and pieces of this, but I wasn't aware of an overall connected places strategy – now I am."

"It all sounds very good in theory, but in practice I have my doubts."

"I feel more informed about the whole idea, but my concern was still not answered by the visuals. How secure is this data?"

"My concerns are still the same that I had in the first session. About the privacy and cyber security angles, and the monitoring… Government sites are being hacked… Nothing is 100% safe… It worries me that something similar is going to happen here."

On that basis, these outstanding questions and concerns would necessarily need to be answered by local managers of connected places technologies.

To aid that process, Pye Tait Consulting has developed an additional resource as a further output from this research, namely a local authority communications and consultation guide. This aims to help local authorities engage with members of the public on the topic, respond to the issues raised and deliver connected places as effectively as possible with the trust and buy-in of their communities.

7. Conclusions and Recommendations

7.1. Conclusions

The survey work, focus groups and interviews with 37 members of the public – spanning a broad cross-section of demographics and characteristics – revealed very limited public awareness of connected places in terms of government policy, concept and purpose, and the extent to which members of the public can recognise whether their own community is part of a connected place. Indeed, only 16% of research participants said they had heard of the term 'connected places' prior to taking part in the research, although 43% had heard of the term 'smart cities'.

A degree of upfront concept explaining and prompting was needed around the use cases of connected places technologies. However, research participants generally grasped the intended role of the technologies and how they might be deployed in local community settings sufficiently to be able to express their favourability and discuss their views on the relative pros and cons.

Experience from the focus groups suggests that those research participants more embracing of connected places technologies tend to be more easily able to identify with their prevalence in aspects of everyday life, including their role in delivering improved outcomes. This might include, for example, technologies that can support more efficient travel or transport navigation; help communities be more prepared for and responsive to local environmental challenges; deliver improved health and social care outcomes; and tackle crime.

Whilst the sample was too small to undertake any form of robust demographics analysis, several participants, from various age groups, noted a 'generational divide'. This points to younger people in society being more active users of technology, more used to sharing data online, such as via social media, and having a greater degree of indifference to being monitored than older people.

Concerns about connected places appear quite widespread and typically span: how securely various collected data are maintained in reality – despite what national guidance might say; protection of personal privacy (the 'Big Brother effect' was mentioned in several focus group discussions and interviews); an apparent lack of transparency around technology deployment in local communities; and a fear around how data are used by connected places managers or third party contractors once collected.

Members of the public are concerned about whether managers of connected places (namely local authorities and any affiliated contractors) can be trusted to use collected data as intended, and if it might be sold on; the risk and possible consequences of cyber attacks which are an unknown quantity; the potential costs involved in implementing connected places – especially where they worried about cuts to local services and the rising cost of living, including council tax; and whether there are adequate fail safes in place should technologies or data security mechanisms fail.

These various concerns raised by members of the public signal a lack of confidence in the deployment of connected places technologies. This is further exacerbated by not knowing which specific technologies are already being deployed in their own communities; whether they are being delivered in line with the law, standards and practices outlined in the video and infographic; whether actual deployed safeguards are sufficient to mitigate external threats; and what the timescales are for future implementation of connected places nationally and locally.

For these reasons, the video and infographic explainers (developed to help outline the technologies and provide information and reassurances in response to the main questions and concerns raised) were considered helpful but were not able to fully alleviate public concerns.

In summary, the research opened the eyes of a sample of members of the public for the first time to what connected places are about, including the benefits and potential issues involved. Participants were engaged with the topic and evidently keen to find out more and understand what is happening in their local communities.

However, local managers of connected places now have a vital role in providing information about what is happening to people in those areas; demonstrating how they are working in line with what is expected of them, providing adequate data reassurances to members of their community and building trust.

7.2. Policy recommendations

DSIT may wish to consider adopting the following recommendations:

1. **Better enable managers of connected places to engage more effectively with their local communities on matters of public interest, particularly relating to connected places technologies.**

   DSIT should consider developing a strategy and toolkit to better enable managers of connected places to gauge more effectively, and take account of, matters important to their local communities when designing and implementing connected places technologies.

   Three key resources would include those developed from this research, including the high-level video and infographic explainers, as well as the separate local authority communications and consultation guide.

   DSIT may wish to bring together connected places managers via its existing networks to introduce these resources and gain buy-in and commitment to taking them forward within their communities.

2. **Encourage managers of connected places to pursue their connected places journey and be more proactive in identifying ways to overcome barriers that they may face.**

   Previous research has identified that organisations managing connected places are at different stages of their journey, meaning that – for some – more fundamental barriers may need to be overcome before being ready to engage with local communities, such as obtaining sufficient funding, resources, technical expertise, and building confidence in managing cyber security risks.

   As such, DSIT, in conjunction with the NCSC and CPNI, should continue to actively promote the concept of connected places, use-cases and technologies involved. At the same time, it should keep its existing guidance and resources up to date and work with local government organisations to ensure that those resources remain helpful, relevant and easy to use.

   It might be appropriate, for example, to supplement these resources with guidance on preparing internal business cases to kickstart connected places strategy development, and good practice/case studies from local authorities that have been able to navigate hurdles successfully.

3. **Consider developing a central repository of tools and resources relating to connected places technologies that are aimed at members of the public, especially where their local authority may not have clear, outward facing information.**

   DSIT should consider developing an online microsite drawing together existing available trusted information about connected places and associated technologies that are aimed

at members of the public. This could include the video and infographic produced as outputs from this research, as well as other resources and links to official sources of advice and guidance aimed at members of the public relating to data security and privacy.

Other video resources that DSIT may wish to signpost could potentially include the following:

- DSIT: Connected Places Cyber Security Playbook
- Connected Places Catapult: A Vision for Connected Places
- Connected Places Catapult: The Future of Cities