Department for Digital, Culture, Media & Sport

Surveying UK Connected Places

Final report

September 2022

Cert No: QEC19593371/0/Q Rev: 001

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1. Introduction

The connection of homes, businesses, and governments afforded by the internet, and the programming languages that support it, has prompted a set of radical changes in the way societies do business, the way individuals communicate, and the way that governments at local and national levels deal with citizens, companies, and each other. The advance of telecommunication technologies alongside and intertwined with the rapid pace of development of the internet has changed virtually every aspect of our lives.

In recent years, a number of these technologies have enabled systems and equipment to be linked so that far more can be achieved than merely the exchange and transmission of information. Advanced software now allows for equipment to self-monitor and report when it requires maintenance and upgrading; social and security systems can now monitor and direct help and support to where they are most needed; and utilities are able to adjust supply in real time depending not only on total demand but on the type of demand and even the social groups behind the demand.

All of this is part of a second-wave of revolution building on the technology and software now becoming available. The overall term for it is 'smart systems' – i.e. solutions which utilise advanced software and artificial intelligence to leverage human systems. When smart systems are linked and expanded they are often known as 'connected places'.

The National Cyber Security Centre (NCSC) defines a 'connected place' as being:

> *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.*

A connected place will use a system of sensors, networks, and applications to collect data to improve its operation, including its transportation, buildings, utilities, environment, infrastructure, and public services. When used in some locations, connected places are sometimes referred to as smart cities. Further details are provided in Appendix 3

Local authorities across the UK have ambitious plans to deploy connected places technologies to bring a number of benefits to their communities. Connected places have the potential to boost productivity, create jobs, improve safety, provide environmental benefits, and make public services more efficient and accessible. However, with the benefits offered by connected places, come significant security risks. The ability of hostile actors to disrupt and even sabotage critical energy infrastructure is well known. However, such activity can also compromise other aspects of a connected place, from remote health monitoring of vulnerable people and the disrupting of traffic light systems, to data breaches in community systems and the stealing of criminal records. Further details are provided in Appendix 3. DCMS therefore collaborates closely with the NCSC and the Centre for the Protection of National Infrastructure (CPNI) to support the security of connected places.

To support this work, DCMS wished to understand the experiences, approaches, ambitions, concerns and additional support needed by 'buyers' or demand-side customers of connected places technologies in the UK.

To do so, they commissioned Pye Tait Consulting to undertake online survey-based research to explore buyers/demand-side customers of connected places technologies and ecosystems to identify relevant evidence across different types of public and private sector organisations and across a range of use cases, including healthcare, transport/mobility, utilities and waste.

This report describes what is working well and where challenges are faced to inform future interventions, requirements regarding guidance and support as well as recommendations in relation to DCMS' policy objectives and tech priorities.

1.1. Structure of this report

The report structure indicates findings via the online survey from local authorities and non-local authorities based on a categorisation according to respondents' answers to key identifier variables (routers) through the survey.

Report structure – description of each section

Section	Contents
1.Introduction	Background and purpose of the research
2.Summary of approach	Description of the main research methods and outreach strategies. (Further details can be found in Appendix 1)
3.Respondent Profile	Explanation of respondent types and details on their organisation and location
4. Strategy, technologies and features	Whether organisations have connected places strategies in place and for how long
5. Drivers and origins	How connected places strategies were developed and the most important driving factors/barriers to initial implementation
6. Governance and management	Who is in charge of connected places at a local level and how they are managed
7. Security	Steps taken to ensure cyber security measures are in place
8. Suppliers	Procurement of technology and cyber security measures
9. Government support	Awareness of guidance and further support needs
10. Ambition	Findings from organisations that do not currently use connected places technologies but plan to do so
11. Conclusions and suggested considerations	What the findings reveal about the maturity of connected places in the UK

2. Summary of approach

This section provides a summary of the approach with further details in Appendix 1.

2.1. Questionnaire drafting and testing

DCMS proposed the initial questions to the survey. These questions, and their response options where relevant, were subsequently refined by Pye Tait with input and support from DCMS. The final version comprised eight different sections with several routing pathways depending on the level of maturity (see section 3.2) of the responding organisations.

Respondents were able to complete the questionnaire via an online survey set up by Pye Tait, by directly emailing a dedicated email address set up for this project, or by sending their response to the Secure Connected Places Team at DCMS via email and/or pdf attachment. The online survey was hosted by SNAP. This method was chosen to allow respondents to collaborate within their organisations if required. All bar one of the responses were submitted via the online survey. The survey was open for a total of five weeks from 20 June to 24 July 2022.

2.2. Outreach

Online hub

To aid the outreach, Pye Tait set up an online hub with supporting documentation, explanations on the project, the definition of connected places, who the survey is aimed at, the survey questions/link, privacy notices and how the respondents' data will be used. Additional information included external links to guidance and contact details for Pye Tait and DCMS if the organisation had additional questions. The link for this webpage was sent with all emails to local authority and non-local authority contacts to aid completion of the survey.

The survey was aimed at individuals working in local government or other organisations with responsibility for the design, procurement and management of connected place technologies. Key target audiences included (but were not necessarily limited to);

- Regional and local authorities in the UK
- Transport authorities and operators (for example: rail, aviation, ports, roads and bus operators)
- Health and social care providers
- Smart utilities providers (for example: waste, water)
- Property and building management companies
- Sports and cultural venues
- Universities

The survey allowed multiple responses per organisation (for example from different departments/functions) with the option to either provide an organisation-level response or sub-organisation level response.

Local Authority contacts

For the local authorities, two main approaches to compiling contacts were used; top down (CEO level contact list) and bottom up (Directors and Heads of relevant departments contact list).

The first wave of outreach consisted of a survey-invite letter sent directly to all local authority CEOs by Julia Lopez MP, Minister of State for Media, Data, and Digital Infrastructure.

For the second wave of local authority contacts, specific departments and functions were targeted ranging from Building & Engineering (Architectural Services) to Transport/Highways (Public Transport Policy & Support; Transport Planning). This created a final list of different contacts in relevant job roles were emailed. The three-pronged approach, along with the CEO contacts, ensured that every local authority within the UK received information and a link to the survey from DCMS at least once.

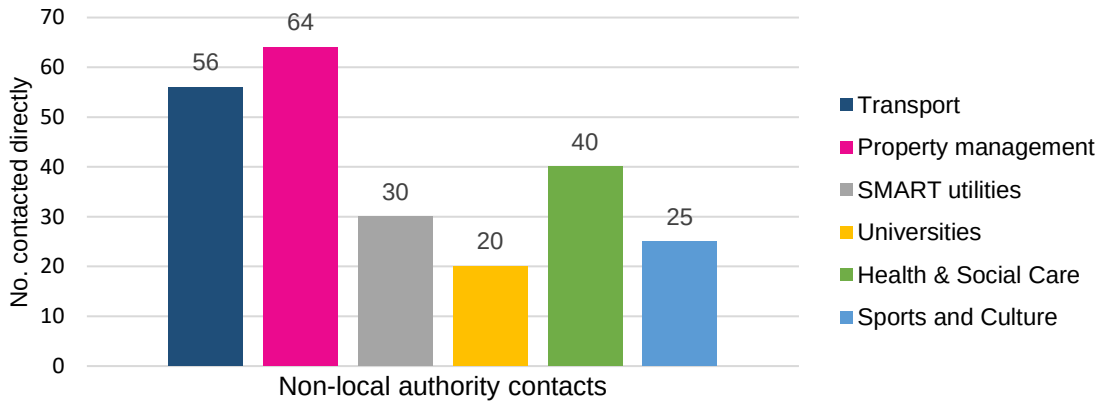
The local authority CEOs who had yet to respond to the survey were emailed a reminder in the third week of the survey.

Non-Local Authority contacts

For the non-local authority contacts, Pye Tait compiled lists using the subscription-based Bureau van Dijk FAME database and spent significant time on desk research. FAME contains information of more than 5m UK-based organisations including contact details. Data were manually filtered to highlight organisations from specific sectors relevant to the use cases and likely to be involved in large-scale connected places procurement or infrastructure projects.

DCMS supplemented outreach to non-local authority contacts, engaging with organisations the department had pre-existing relationships with to promote the survey. The list of contacts was continuously added to throughout the duration of the survey and led to three waves of initial outreach. All contacts received a reminder email at several stages during the survey.

Figure 1: Number of non-local authority organisations contacted by sector



Social media and newsletters

Pye Tait and DCMS promoted the survey to their respective Facebook, LinkedIn and Twitter channels throughout the duration of the survey being live.

Additionally, the Secure Connected Places team at DCMS included information about the survey in a number of industry newsletters, shared the link to the survey with several industry groups, and directly reached out to a number of local authorities who had previously engaged with DCMS.

2.3. Targets and final totals

Local authorities and non-local authority organisations who are involved with the implementation and procurement of connected places technology, were the main targets for this survey. The aim was to obtain at least 160 and 30 responses respectively.

In total 215 responses were received to the survey. After cleaning and review, 23 responses were removed from the final dataset. After a review of the survey answers, it was agreed the removed responses had a focus that was 'single enterprise', i.e., they were only interested in internal business uses of technologies such as CCTV. Their focus was not on the application of this technology in a connected places context and as such their contributions to the survey were not beneficial to keep in the data set.

We retained a total of 15 non-local authority survey responses - the breakdown is shown below:

Table 1: Non-local authority respondent by sector

Non-local authority respondent type	Number of respondents
Health and social care provider	4
Transport authority and/or operator (for example rail, aviation, ports/maritime, road/bus operator)	4
University	3
Smart utilities provider (for example waste, water)	2
Other (LEP and an architectural and engineering business)	2

Further detail regarding the organisations responding is provided in section 3.

2.4. Limitations of the data, responses received and question types

Non-local authorities were a challenging part of the outreach. Companies do not brand themselves, necessarily, as a connected place organisation and contacts responsible for connected places technologies within an organisation are hard to identify as they might utilise many different aspects of a job role and therefore titles. Head of Cyber Security is a role that is becoming more frequent but is not yet common practice.

Post-Covid organisations are reluctant to connect a call without a specific name upfront. Over 300 phone calls were made across the designated sectors but ultimately a very small number of non-local authorities completed the survey despite targeting sector bodies, trades associations and known digital-based organisations. Therefore the 15 participating organisations are not likely to be representative of the wider non-local authority sector but the size of the population is not known. This also means the base numbers for non-local authorities charts and analysis are too low to draw meaningful conclusions.

Findings are presented by organisation type (local authorities and non-local authorities), or, as relevant, by maturity group (see section 3.2). Other findings such as cross-tabulations with region or devolved nation groupings or via maturity group that describe differences of ~5+% are also pointed out.

A few questions were open text or had an 'other' for respondents to specify and write as much or as little as they wished. These types of responses have been analysed according to

most to least mentions and are presented with a frequency number rather than a percentage. Questions that prompted respondents to select all that apply have been analysed by responses rather than by respondents to show the category provided most frequently selected.

3. Respondent Profile

The survey achieved a total of 188 valid responses: 173 from local authorities and 15 from non-local authorities.

Of the 173 local authority respondents, 127 responded on behalf of their organisation as a whole and 46 on behalf of part of their organisation. For those representing a part of their organisation, 41 provided details of the functions/departments they represented:

Table 2: Local authority respondents per department type

Department	Number of respondents
Digital and/or ICT Services	23
Economic and/or business sector	8
Strategy Management	2
Smart Place/community	2
Transport	1
Net Zero	1
Other	4
Total	**41**

3.1 Regional responses of local authorities

The following table and chart show the spread of local authority responses across the nations and regions of the UK. The highest response rates were received from Yorkshire and Humber, Scotland and Northern Ireland respectively.

Table 3: Local Authority response rates by nation/region

Regions	Local authority population	No. Responses	% Responses per region
East	51	14	27%
East Midlands	40	17	43%
West Midlands	35	18	51%
Total for Midlands region	**126**	**49**	**39%**
North East	14	7	50%
North West	42	22	52%
Yorkshire and the Humber	23	13	57%
Total for North region	**79**	**42**	**5%**
London	33	13	39%
South West	36	10	28%
South East	73	25	34%
Total for South region	**142**	**49**	**35%**
Scotland	32	18	56%
Northern Ireland	11	6	55%
Total for devolved nations	**65**	**34**	**52%**
Total[1]	**412**	**173**	**42%**

[1] Total responses include seven instances where two responses were received per local authority, as well as 17 anonymous responses where it is not known whether these might represent more than one response per local authority.

The local authority target was exceeded, and responses have been received from around the UK (nine regions and three devolved nations) with at least a 27% response rate (and in six regions well over 50%). See Figure 2.

Figure 2: Heat map of local authority survey responses

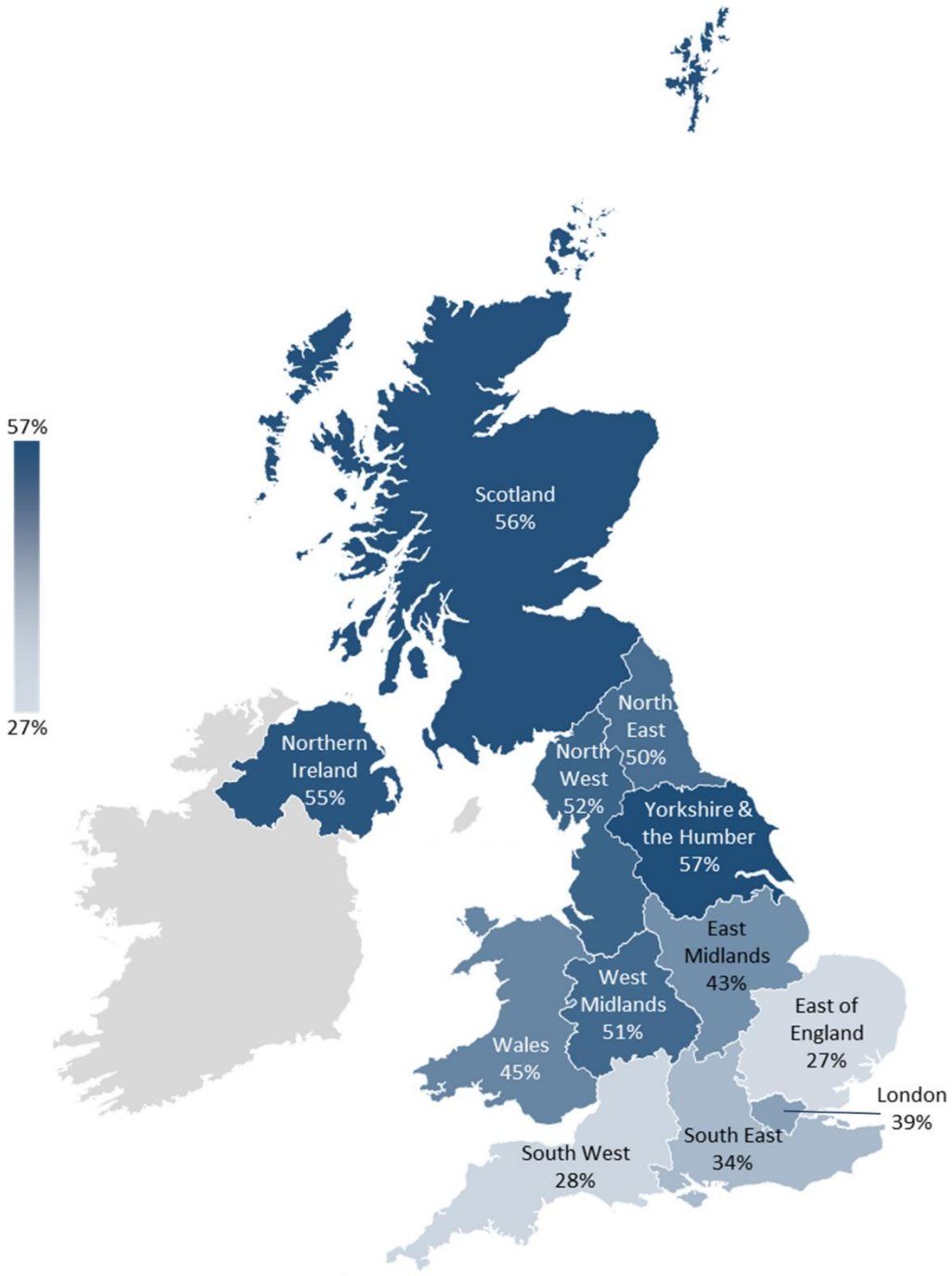
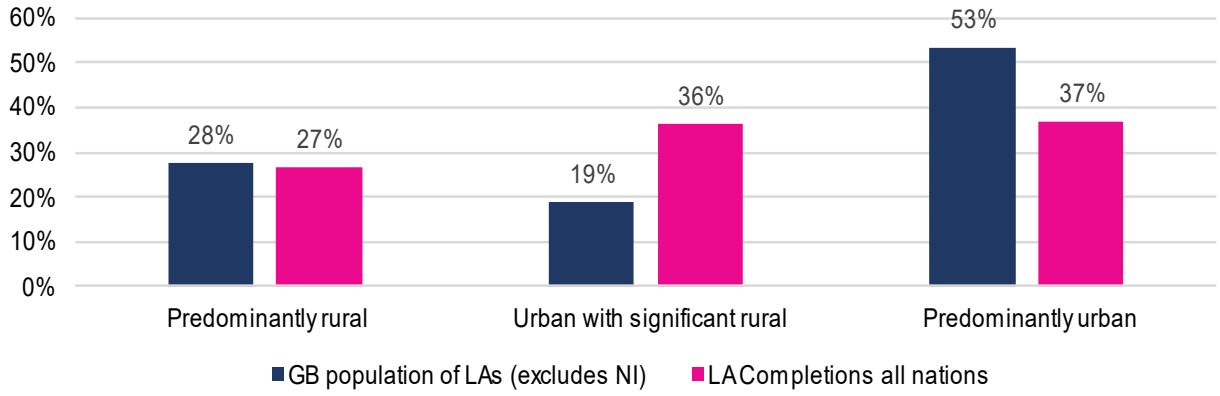


Figure 3: Spread of local authority responses by location type



Base: all Local authorities - 173 respondents but please note the chart above excludes the 6 from Northern Ireland as their definitions refer to settlements rather than local authorities.[2]

3.2 Maturity groupings

Each of the 188 respondents were asked three routing questions which decided which group they fall into for analysis purposes.

Main routers:

Have in place or work according to a connected places (or smart city) **strategy**

Manage connected place technologies or solutions

Ambition to start using connected places/smart city technologies/solutions

As a result, responses have been analysed as per four distinct maturity groups as explained below. As the majority of the respondents fall into maturity groups 1 and 2 these are described first with observations about group 3 following in section 10 (Ambition). Comments from the much smaller group that fall into group 4 appear in section 10. All groups contain a mix of local authorities and non-local authorities.

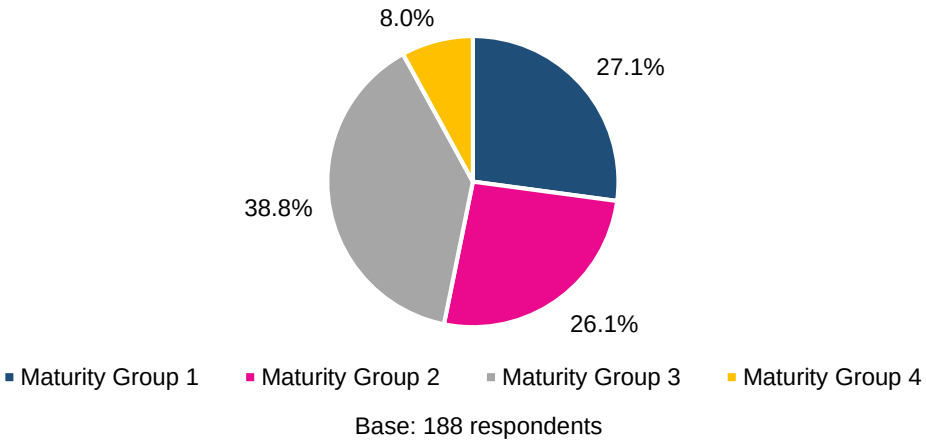
[2] Definition sources: https://www.gov.uk/government/statistics/2011-rural-urban-classification-of-local-authority-and-other-higher-level-geographies-for-statistical-purposes, https://www.gov.scot/publications/scottish-government-urban-rural-classification-2016/pages/5/ and https://gov.wales/sites/default/files/statistics-and-research/2018-12/080515-statistical-focus-rural-wales-08-en.pdf.

Table 4: Maturity groups determined by three key variables in the survey.

Maturity Group 1	Connected places strategy in place and manages connected places technologies	51 respondents
Maturity Group 2	No connected places strategy in place but manages connected places technologies	49 respondents
Maturity Group 3	May or may not have a connected places strategy in place. Do not yet manage connected places technologies but have an ambition to do so	73 respondents
Maturity Group 4	May or may not have a connected places strategy in place. Do not yet manage connected places technologies and have no ambition to do so	15 respondents

Base: All respondents (173 Local authorities and 15 non-local authorities)

Figure 4: Responses allocated to maturity groups 1 to 4.



Base: 188 respondents

Each section of the report analyses the following maturity groups:

Section 3: Respondent profile	Groups 1-4
Section 4: Strategy, technologies and features	Groups 1 and 2
Section 5: Drivers and origins	Groups 1 and 2
Section 6: Governance and management	Groups 1 and 2
Section 7: Cyber Security	Groups 1 and 2
Section 8: Suppliers	Groups 1 and 2
Section 9: Government support	Groups 1 and 2
Section 10: Ambition	Groups 3 and 4
Section 11: Conclusions	Groups 1-4

NB: All diagrams presented in the following sections are based on the connected place survey as carried out by Pye Tait in 2022.

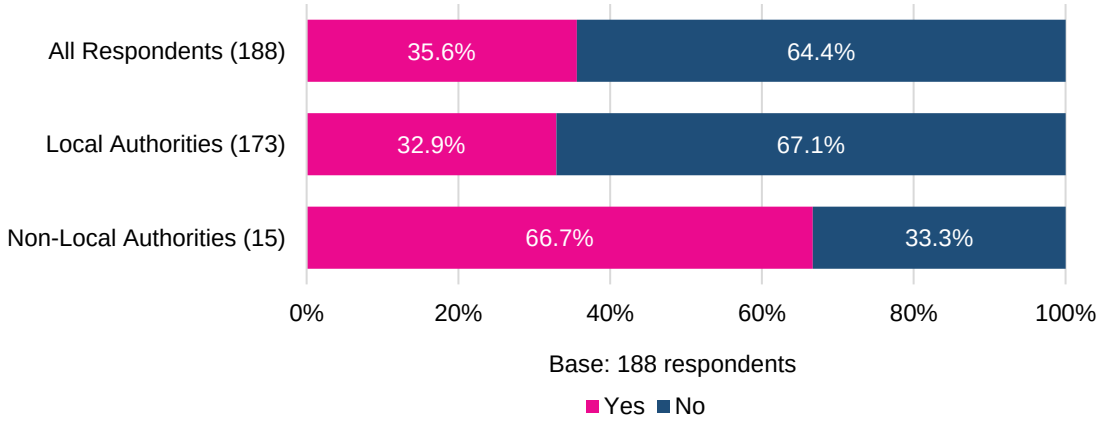
4. Strategy, Technology and Features

Section 3: Respondent profile	Groups 1-4
Section 4: Strategy, technologies and features	**Groups 1 and 2**
Section 5: Drivers and origins	Groups 1 and 2
Section 6: Governance and management	Groups 1 and 2
Section 7: Cyber Security	Groups 1 and 2
Section 8: Suppliers	Groups 1 and 2
Section 9: Government support	Groups 1 and 2
Section 10: Ambition	Groups 3 and 4
Section 11: Conclusions	Groups 1-4

4.1 Use of a Connected Places Strategy

All 188 respondents to the survey were asked whether the organisation they work for has a connected places or smart city strategy. A third of local authorities (33%) said yes as compared with two thirds (67%) of non-local authorities.

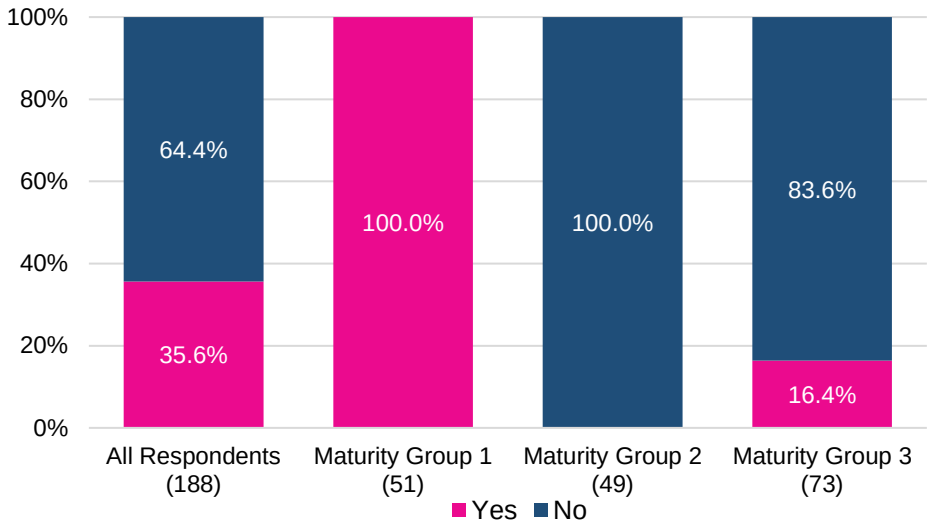
Figure 5: Use of a connected places or smart city strategy by organisation type



Although the base numbers between the local authorities and the non-local authorities are 173 and 15 respectively, the chart illustrates that 67% non-local authority organisations appear to be well ahead of local authorities in terms of having a connected places strategy. One possibility for this is that non-local authorities tend to be very specific organisations (for example, universities, utilities, transport delivery organisations) and therefore their connected places strategy is likely to be a domain-based strategy. As a result, their strategies may require less complexity, as opposed to local authorities who must develop a connected places strategy that spans multiple domains.

Another way of looking at this is via the maturity groups. Those who are managing connected place technologies or have an ambition to do so have been allocated to one of the maturity groups. The figure below indicates those with a strategy, indicating that there just under 36% (67) of all respondents have a strategy but that the majority do not.

Figure 6: Use of a connected places or smart city strategy by maturity group



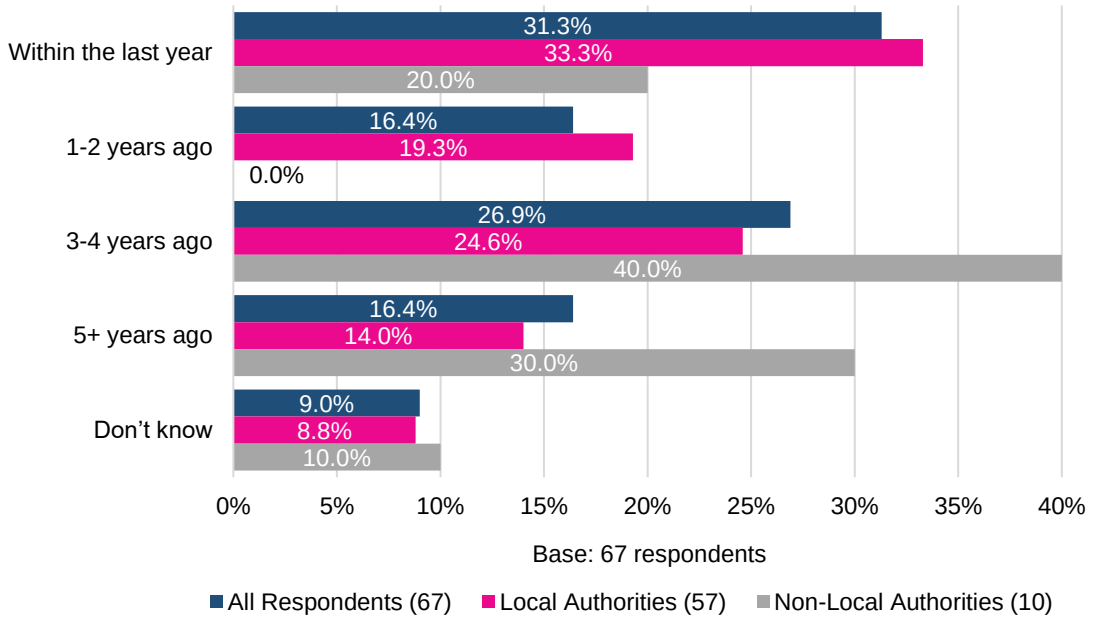
The possession of a formal strategy is not dependent on size or sector. It is important to note that the survey was self-selecting and that responding non-local authorities – far fewer in number – may have been more predisposed to respond if they were already engaged with connected places.

46% (21) of respondents from Northern England said they had a connected places strategy – a greater proportion than for other regional clusters. Additionally, 40% (26) of predominantly urban local authorities said yes, compared to 20% (9) of predominantly rural local authorities.

4.1.1 Strategy implementation time frame

Those in possession of a strategy explained how long it had been in place.

Figure 7: Strategy implementation time frame



Just under half (48%) said that they adopted their connected places strategy within the last two years, while 44% adopted their strategy three or more years ago, and 9% were unsure.

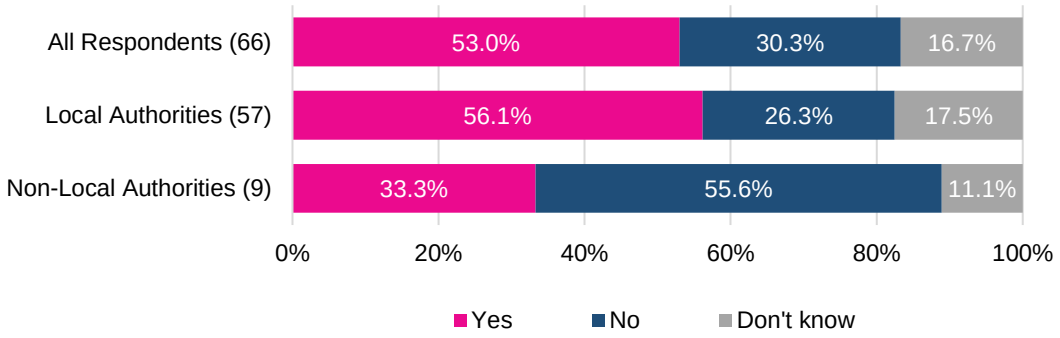
Other insights include:

- the majority of respondents (75%, 50) said that their strategies were adopted less than five years ago.
- 100% (10) of the non-local authorities with a strategy, said their strategy was implemented more than three years ago.
- 67% (8) of the 12 local authorities with a strategy and from the devolved nations said the same. Of those, 3 of the 8 had implemented their strategy more than five years ago.
- those in maturity group 3[3] with a strategy are more likely to have implemented their strategy within the last two years (67%, 8) versus all respondents with a strategy.

Those respondents with a strategy were then asked whether it is publicly accessible.

[3] Maturity group 3 – may have a strategy but do not yet manage connected places technologies

Figure 8: Availability of the connected place strategy in the public domain



Of those in possession of a strategy across the maturity groups, 53% say it is publicly accessible – higher among local authorities (56%) than non-local authorities (33%).

4.2 Management of connected place technologies or solutions

All 188 respondents were asked whether their organisation currently manages connected place technologies or solutions. Of these:

- 53% (100) said that they **do**. These have been categorised as maturity group 1 (if in possession of a strategy) or maturity group 2 (if not in possession of a strategy);
- 47% (88) said they **do not**. These have been categorised as maturity group 3 (where there is an ambition to do) or maturity group 4 (where no ambition to do so).

The remainder of this section and sections 5 to 9 report on the findings from those in maturity groups 1 and 2. Section 10 reports on the findings from maturity groups 3 and 4.

4.2.1 Types of technologies implemented to deliver connected places services

The survey asked those 100 respondents who manage connected place technologies, what types of technologies their organisation/department (as appropriate) has implemented. These are listed in the Table below in order of frequency. The types of technology in-scope are explained in Appendix 3.

Table 5: Technologies implemented by maturity groups 1 and 2 - *multi-response*

	All Responses	Maturity Group 1	Maturity Group 2
Base (multi-choice responses)	**375**	**204**	**171**
Sensors and actuators	23.2%	22.1%	24.6%
Network connecting devices such as LoRA, NB-IoT, WIFI	18.9%	18.6%	19.3%
Data analytics platforms	15.7%	18.1%	12.9%
Smart cameras	14.7%	11.8%	18.1%
Cloud storage for data collected in connected places	13.6%	15.2%	11.7%
Gateways connecting devices to the cloud	12.5%	13.2%	11.7%
Other	1.3%	1.0%	1.8%

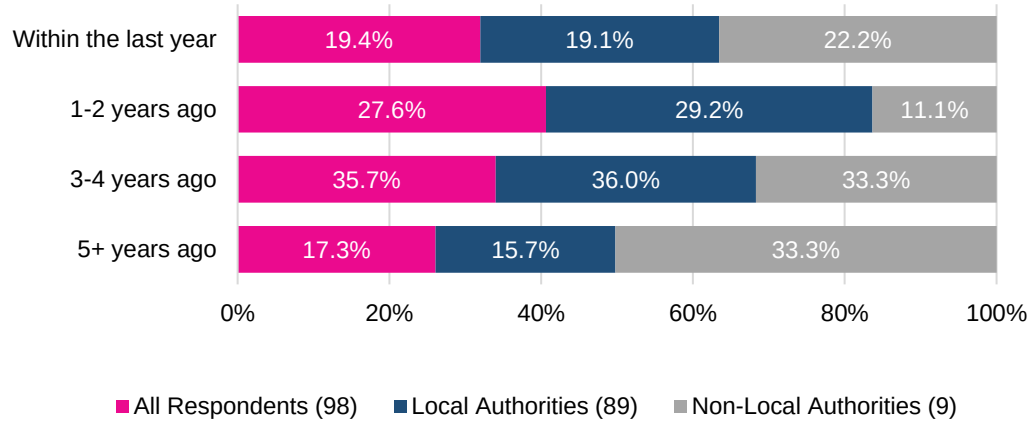
Five respondents (4 local authorities and 1 non-local authority) noted technologies or solutions in 'other' rather than using the listed examples. These include 5G networks, consuming data from third-party aggregators such as Waze and Otonomo, LED lighting, heating and cooling systems, traffic management, city-wide connected place platform integrating data beyond the scope of the local authority domain, and BIM technologies to support smart buildings.

The majority of these are, in effect, holistic connected place solutions applied to transport or connected place management integrating different types of technologies.

4.2.2 Implementation timeframe for technologies

All those in maturity groups 1 and 2 were then asked about the first implementation of these technologies.

Figure 9: First implementation of technologies by type of organisation



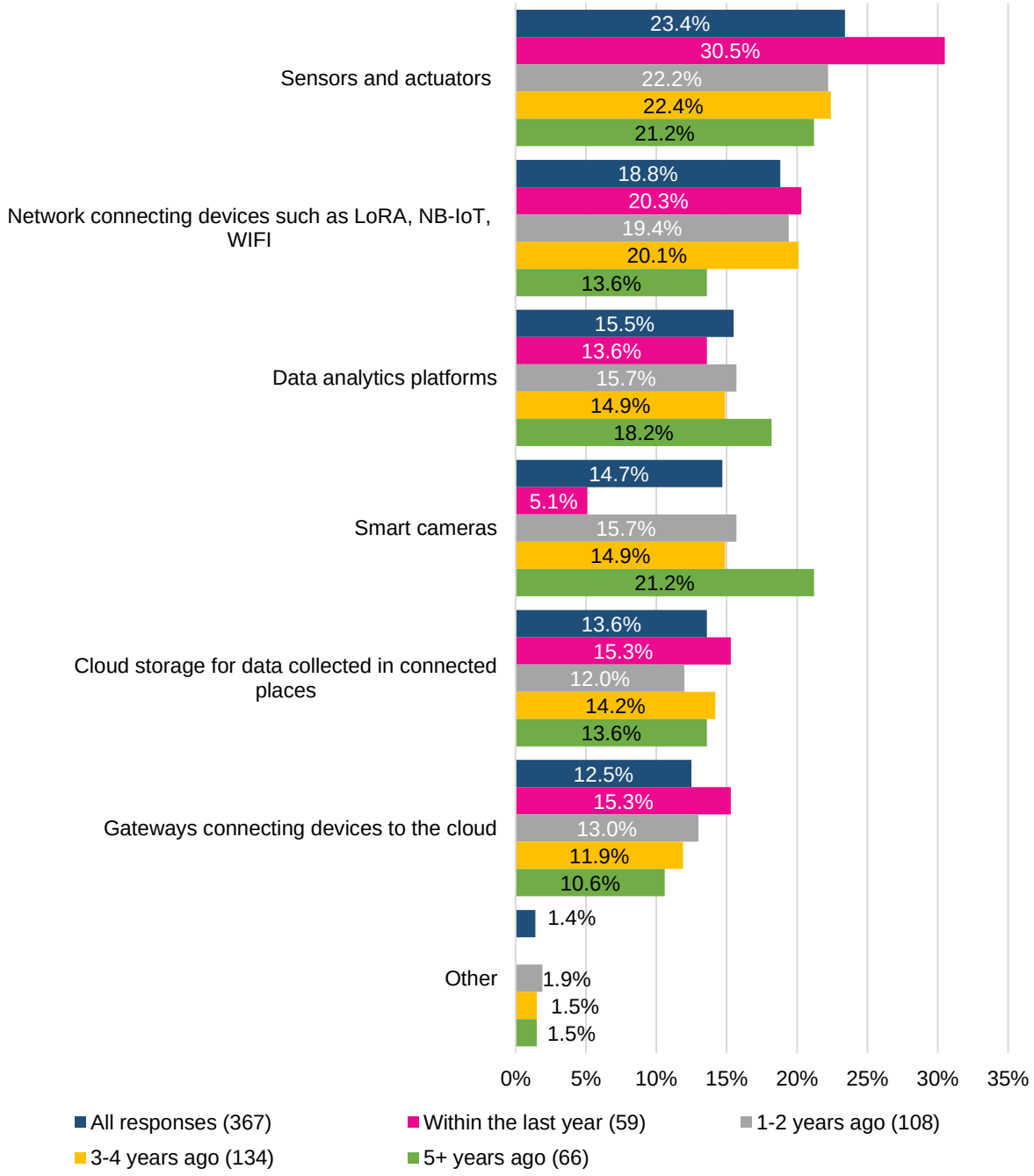
Of the 98 respondents answering this question, 47% said they first implemented these technologies within the last two years, while 53% said three or more years ago.

- A higher proportion of non-local authorities implemented their technologies more than five years ago compared to local authorities.

- None of the five respondents who replied 'other' about their technologies implemented their solution within the last year.

However, some granular differences appear when examining the type of technology against the timeframe of first implementation.

Figure 10: First implementation of technologies by timeframe



The most common technology selected (sensors and actuators) as part of a connected places' portfolio of technologies is more likely to have been implemented within the last year (30.5%) with network connecting devices (the second most common technology) more equally spread across one to four years ago. The findings suggest that smart cameras are a technology to have been around for more than five years.

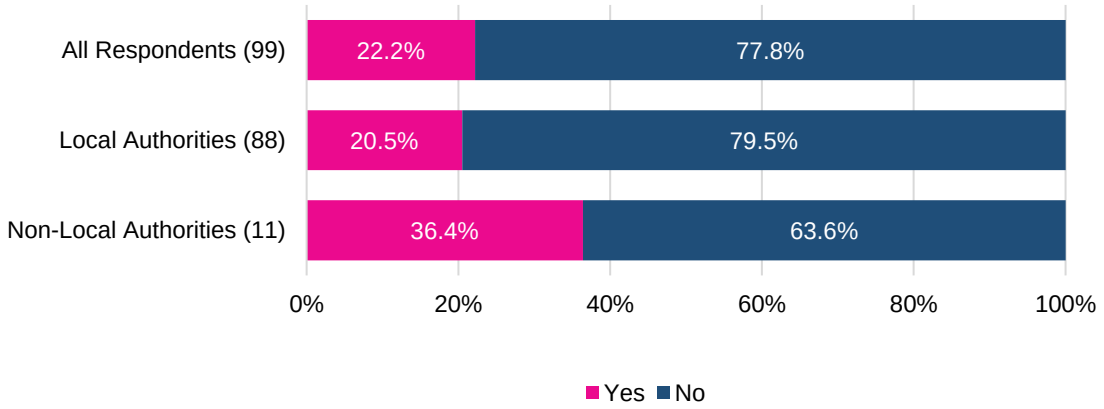
- organisations from maturity group 1 implement data analytics platforms (18%), and cloud storage for data collected in connected places (15%) in greater proportion than those from maturity group 2 (13% and 12%).

- On the other hand, responses from maturity group 2 more commonly mention using smart cameras (18%) compared to those from group 1 (12%).

4.2.3 Next 12 months' spend for implementing/managing connected place technologies

Gaining an understanding about spend on connected place technologies over the next twelve months is a helpful indicator for planned activity and scale.

Figure 11: Do you know what your planned spend will be over the next twelve months by organisation type

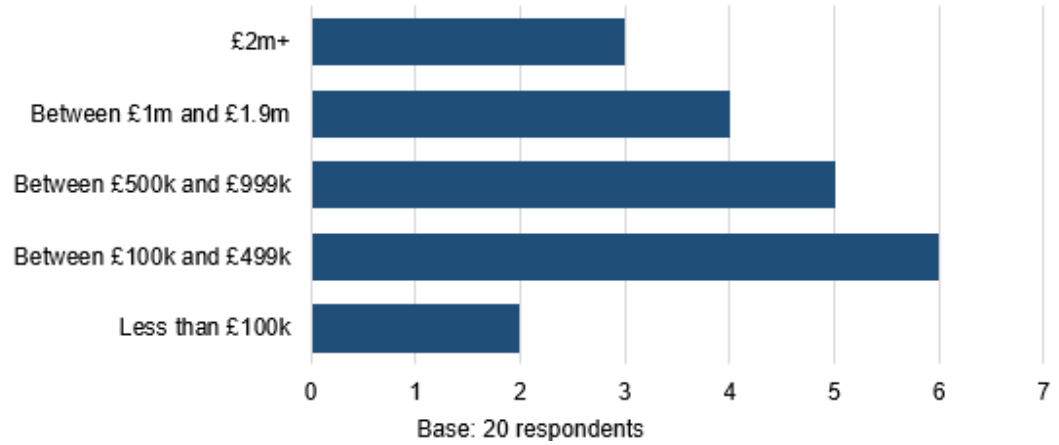


From a total of 99 respondents, 22% overall say they know how much their organisation/department plans to spend (approximately) on connected place technologies over the next 12 months. This percentage is virtually the same for maturity groups 1 and 2.

- non-local authorities are more likely to know the next 12 months' planned spend on connected place technologies than local authorities.

- of all organisations that have knowledge of their spend, 42% (8) implemented technologies within the last year.

Figure 12: Range of monetary values provided over the next twelve months



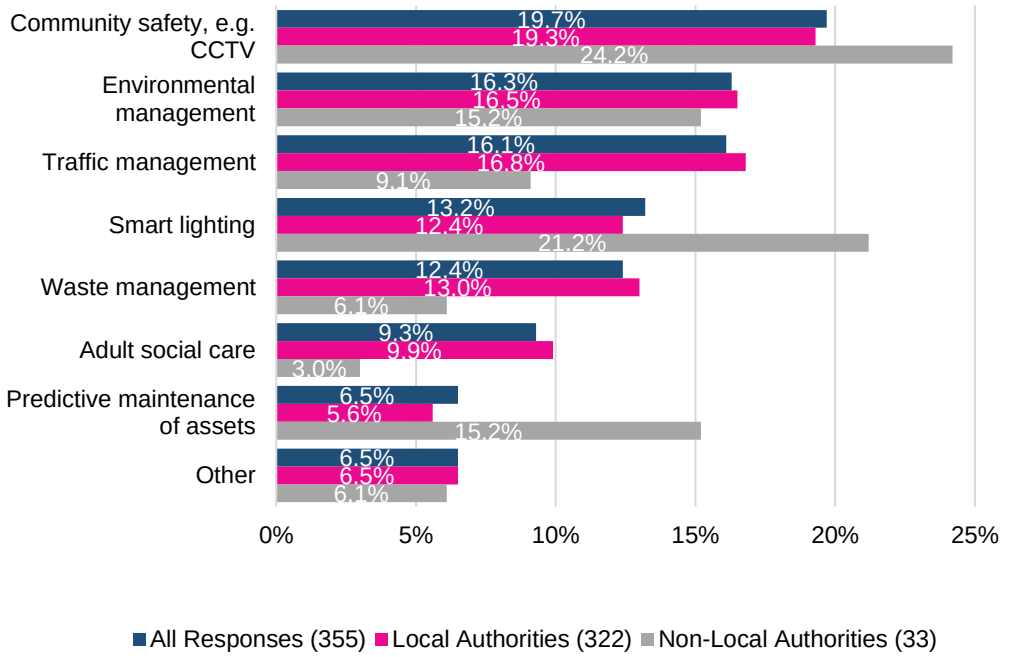
Twenty respondents provided indications of spend for the coming 12 months, of which 85% (17) are Local authorities. There is no discernible trend by geography/region, but 53% (9) of the Local authorities are predominantly urban.

Figures range from £5,000 to £5,000,000 and the median is £502,000. Grouped into monetary bands the chart above shows indicative spend per band.

4.2.4 Types of public services provided through connected place technologies

The 100 respondents who manage connected places technologies provide public services that rely on a number of technologies or solutions for delivery.

Figure 13: Types of public services provided that rely on technologies for delivery *-multi-response*



The most common public service provided through these technologies is community safety, for both local authorities and non-local authority organisations. Following that, non-local authorities most commonly provide smart lighting or predictive maintenance of assets, whereas local authorities provide a more varied mix.

Altogether 7% (23) of all responses were in the 'other' category, in particular: footfall monitoring (4) in town centres; data collection and analytics (4) for example for bus data and parking management; mapping electric vehicle charge points across their area (2); smart sensors for gullies or gritting routes to check winter needs (2).

4.3 Summary – strategy, technologies and the management of technologies

Maturity groups 1 and 2 – with or without a connected places strategy in place but manage connected places technologies (base: 100 but the base varies slightly across questions)

Section 4 Summary

- **36%** of responding organisations have a connected place/smart city strategy in place, of whom almost half have implemented it in the last two years
- **53%** of responding organisations manage connected place technologies (regardless of whether they have a strategy)
- The most common technologies are **sensors and actuators** and **network connecting devices** such as LoRA, NB-IoT, WIFI
- **Sensors and actuators** are more commonly to have been implemented within the last year and **smart cameras** implemented more than five years ago
- Most common public service provided through these technologies is **community safety** (e.g. CCTV) for all responding organisations
- **Environmental management** as a public service is more likely to have been implemented in the last year

5. Drivers and Origins

Section 3: Respondent profile	Groups 1-4
Section 4: Strategy, technologies and features	Groups 1 and 2
Section 5: Drivers and origins	**Groups 1 and 2**
Section 6: Governance and management	Groups 1 and 2
Section 7: Cyber Security	Groups 1 and 2
Section 8: Suppliers	Groups 1 and 2
Section 9: Government support	Groups 1 and 2
Section 10: Ambition	Groups 3 and 4
Section 11: Conclusions	Groups 1-4

5.1 Important factors in driving ambitions to implement or procure connected place technologies (maturity groups 1 and 2)

The 100 respondents who manage connected place technologies or solutions were asked to rank the relative importance of five factors driving their ambitions to implement or procure connected place technologies, from first place to fifth place.

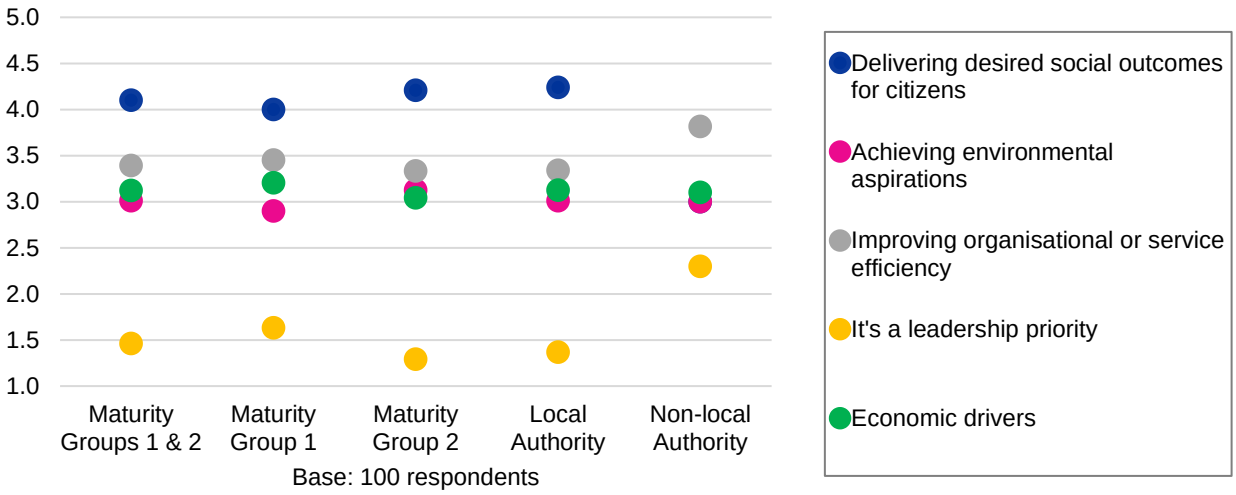
Following the application of weightings[4], the most to least important drivers (denoted by highest (up to 5) to lowest (down to 1) are averaged and set out below.

Table 6: Important factors driving ambitions

Drivers	Average ranking after weighting applied
Delivering desired social outcomes for their citizens such as improved mobility or improved resident experiences	4.1
Improving organisational or service efficiency	3.4
Economic drivers such as delivering cost effective solutions or making their place attractive to business	3.1
Achieving environmental aspirations	3.0
It's a leadership priority	1.5

[4] This question asked each respondent to rank their choices from 1 being 'most important' to 5 being 'least important'. For each statement, inverse weighting factors have been applied, i.e. the total number of respondents giving a '1' rating was multiplied by 5; the total number giving a '2' rating was multiplied by 4, and so on. In the chart therefore, the highest average ranking is the most preferred option, down to the lowest average ranking being the least preferred option.

Figure 14: Drivers for implementing technologies or solutions by maturity group and by type



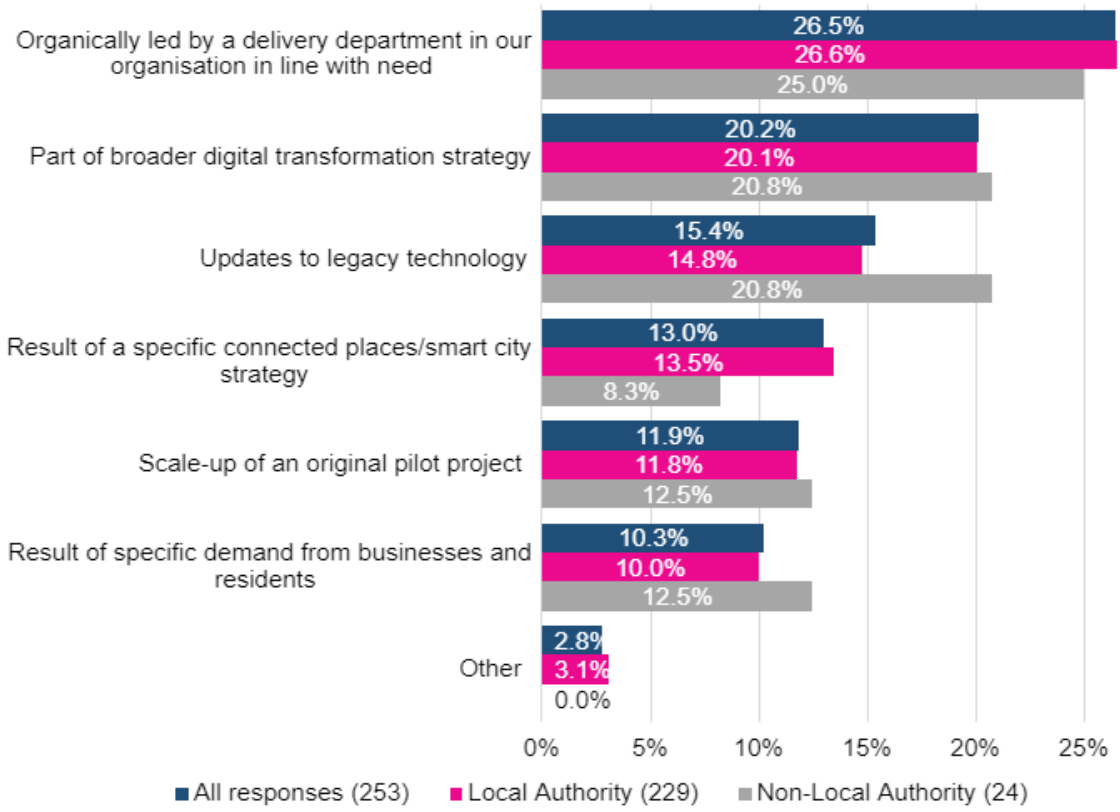
There are noteworthy differences between responding local authorities and non-local authorities as follows:

- "Delivering desired social outcomes for citizens" - local authorities find it more important (4.2) than non-local authorities (3.0).
- "It's a leadership priority" - local authorities find it less important (1.4) than non-local authorities (2.3).

5.2 Development of connected place solutions, products or services

Respondents in maturity group 1 or 2 were asked to select – from a specific list – how their connected place solutions, products or services were developed, for example, whether as a result of a connected places/smart city strategy, or based on updates to a legacy technology or if organically led by a delivery department/organisation in line with need.

Figure 15: Development of connected place solutions, products or services (by organisation type) *-multi- response*



In order to describe how their connected place solutions, products or services have developed, responses indicate that the top response is 'organically led by a delivery department in line with need' (26.5%). This applies to responses from local authorities and non-local authorities.

Non-local authority responses (24 from 11 organisations) indicate that being part of a broader digital transformation strategy and as a result of updates to legacy technology are also likely reasons for development.

Six of seven responses selecting 'Other' explain their development has happened as a result of funding such as grants and partnership projects, mostly in collaboration with academic institutions. All of these respondents represent the views of local authorities and are mostly from Northern England. Other insights include:

- a greater proportion of maturity group 2 think that the development is 'organically led by a delivery department in their organisation in line with need' (35%) compared to maturity group 1 respondents (20%).[5]
- respondents from non-local authorities more frequently describe the development happening due to 'updates to legacy technology' (21%) compared to those from local authorities (15%).

[5] Maturity group 1 = do have a strategy in place and they do manage technologies or solutions, maturity group 2 = do not have a strategy in place but they do manage technologies or solutions.

- greater differences exist between regions/nations in terms of those that think the development is 'organically led by a delivery department in their organisation in line with need'. This was selected by just 18% from the devolved nations compared to respondents from Northern England (31%), Midlands and East of England (28%) and Southern England (29%).

- conversely greater proportions of predominantly rural local authorities describe the development as 'part of broader digital transformation strategy' (26%) or 'organically led by a delivery department in their organisation' (32%).

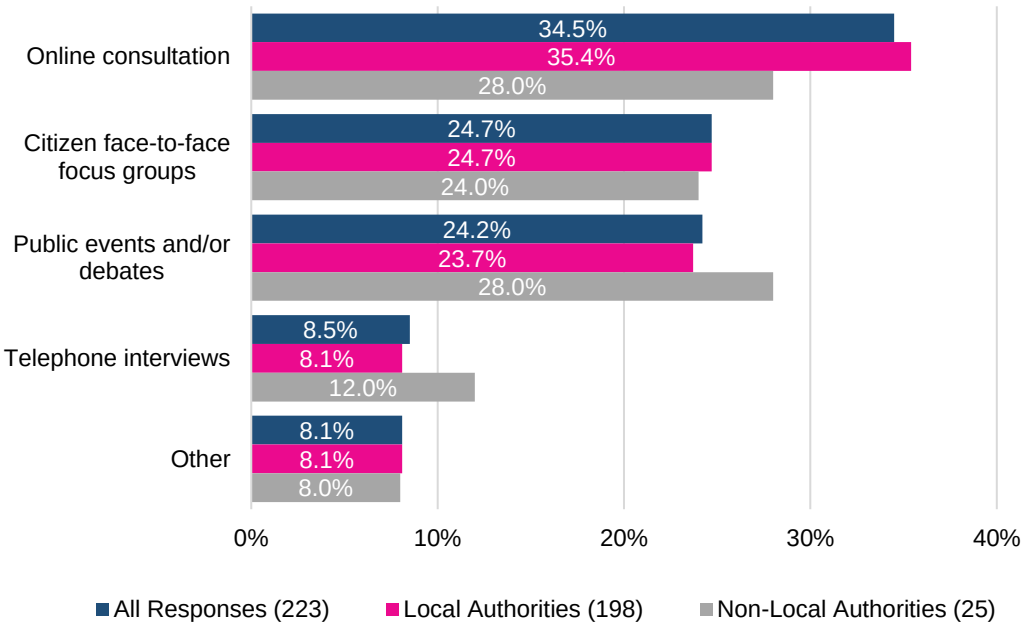
- these methods of development are less likely for those local authorities urban with significant rural (17%; 25%), or predominantly urban (20%; 26%).

Responding organisations implementing technologies within the last year are more likely to see this as a 'result of a specific connected places/smart city strategy' (22%) or even being 'part of a broader digital transformation strategy' (24%) than those who implemented technologies more than 5 years ago (5%, 12%).

5.3 Consideration of the needs of individuals/local area

Respondents in maturity groups 1 and 2 were asked to indicate commonly used methods of communicating information about their connected place with those living and working in the local area.

Figure 16: Consideration of the needs of individuals in the development of a connected place by organisation type *-multi-response*



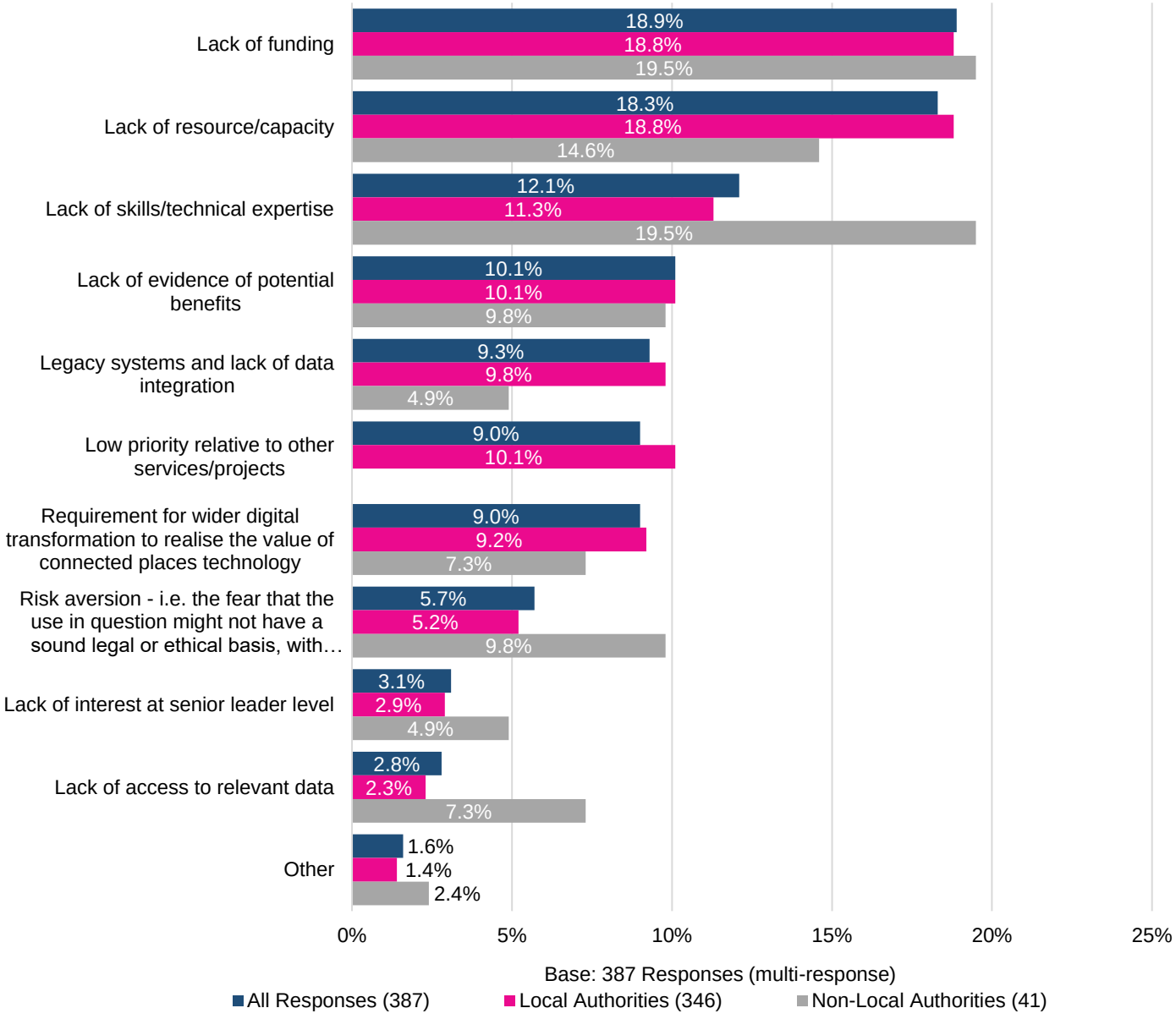
According to the responses, the most frequently selected method for considering the needs of individuals in local areas in the development of their connected place is via an online consultation (35%), and largely by the local authorities. Around a quarter of responses refer to citizen face-to-face focus groups (25%) or public events and/or debates (24%). Approximately one in ten mention conducting telephone interviews. Preferred methods by the non-local authorities are online consultations or public events/debates.

Of the 18 responses to 'other', three mention that they do not use such activities just yet. Others of the 18 say they collect the feedback online, e.g. via social media, and others use research methods such as postal surveys, forums and workshops (3). The majority of these are local authorities from Southern England.

5.4 Biggest barriers to deploying connected places technologies

The biggest barriers from a specified list ranging from funding issues to being risk averse to deploying connected places technologies is an important consideration. It is one that received just under 400 responses.

Figure 17: Biggest barriers to deploying connect places technologies *-multi-response*



For all respondents a major issue is ‘lack of funding’ (local authorities 18.8%; non-local authorities 19.5%).

Both types also suffer from a ‘lack of resource/capacity’ (local authorities 18.8%; non-local authorities 14.6%).

The major difference between the two types of organisation lies in their response to ‘lack of skills/technical expertise’. Almost a fifth (19.5%) of non-local authorities say that this is an issue for them compared to just over a tenth (11.3%) of local authority responses.

Five barriers from ‘lack of skills’, ‘lack of benefits’ and so on to ‘requirement for wider digital transformation to realise the value’ differ in the proportion of responses, as selected by local authorities, by only around 2%.

Of six responses for ‘Other’, four say that there is a lack of understanding and awareness in their organisation when it comes to connected place technologies. They all represent local authorities.

Other insights include:

- among respondents from the devolved nations, ‘low priority relative to other services/projects’ is a bigger barrier (13%) than among respondents from Northern England (7%), Midlands and Eastern England (8%) and Southern England (8%).

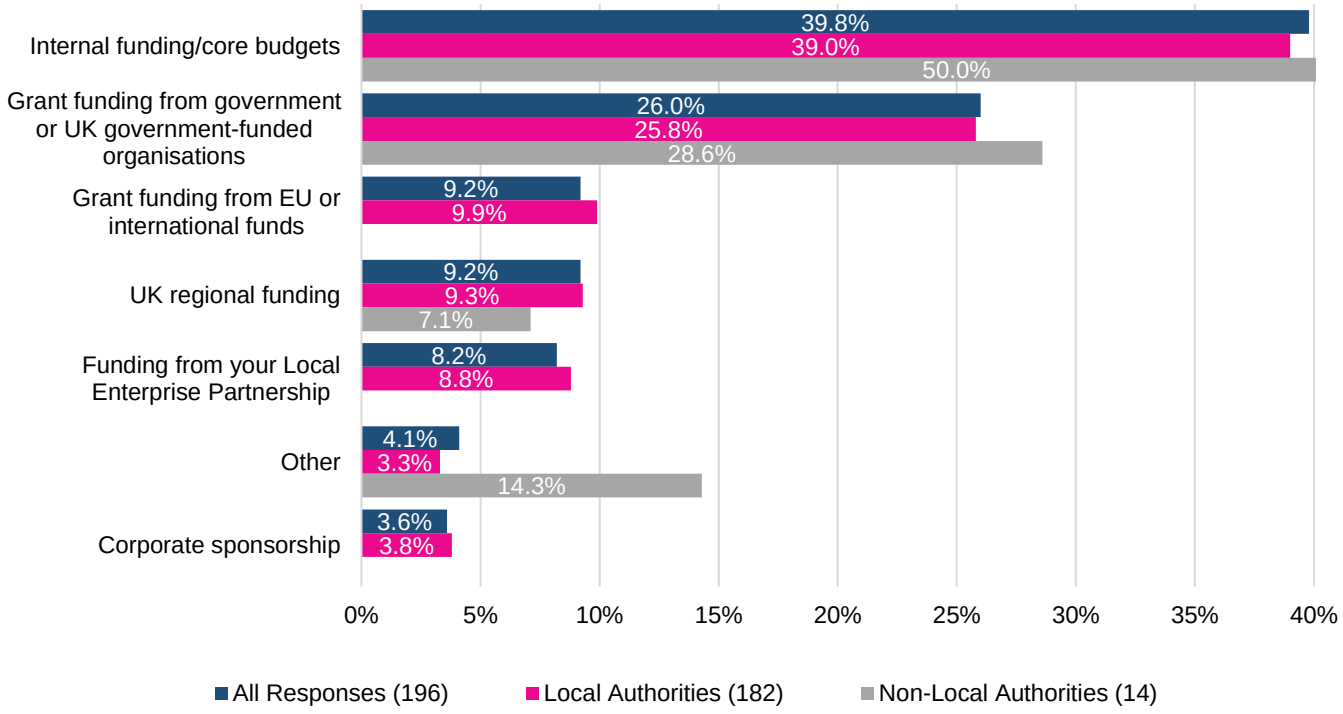
- organisations which have implemented connected places technologies within the last year more commonly pick out ‘lack of evidence of potential benefits’ (15%) than organisations which first implemented them 5+ years ago (9%).

- organisations which have implemented these technologies within the last year more frequently choose ‘lack of resources/capacity’ as a barrier (20%) compared to organisations that first implemented technologies 5+ years ago (15%).

5.5 Funding of the design and implementation of the connected place

How the design and implementation of their connected place is funded was asked of those who manage existing connected place technologies (maturity groups 1 and 2). Respondents chose from a specified list ranging from UK or EU funding to other means such as corporate sponsorship.

Figure 18: Funding the design and implementation of the connected place by organisation type – *multi-response*



Responses most frequently indicate that the design and implementation of the connected place they manage is funded from internal funding or core budgets (39.8%). Just over one quarter (26%) cite using grant funding from government or UK government-funded organisations.

Nearly one in ten (9.2%) reference grant funding from EU/international funds and UK regional funding. A similar proportion (8.2%) report using funding from their Local Enterprise Partnership, and 3.6% mention corporate sponsorship.

Of eight responses selecting 'Other', two mention private partnership funding but do not go on to explain further. Two other responses point to the use of different types of publicly available funding.

None of responding non-local authorities selected 'grant funding from EU or international funds' compared to 10% of local authorities. Using 'internal funding/core budgets' is key to non-local authorities (50%) in comparison to local authorities (39%). Other insights include:

- corporate sponsorship is a source of funding that is rarely mentioned (7%) but is mentioned by three respondents in Northern England and the remaining four are scattered throughout other regions.
- those from predominantly rural areas more frequently referenced using grant funding from government or UK government-funded organisations (33%) compared to respondents from urban with significant rural areas (23%) or predominantly urban areas (26%).
- responses from maturity group 2 use internal funding/core budgets slightly more (48%) than maturity group 1 (33%).

5.6 Summary: Drivers and Origins

Maturity groups 1 and 2 – with or without a connected places strategy in place but manage connected places technologies (base: 100 but the base varies slightly across questions)

Summary

- The most important driver (4.1 out of 5) is '**Delivering desired social outcomes for their citizens such as improved mobility or improved resident experiences'**
- The least important driver is **'it's a leadership priority'**
- The development of connected place technologies is more likely to be '**organically led by a delivery department in line with need'**
- The most frequently selected method for considering the needs of individuals in local areas in the development of their connected place is via an **online consultation**, followed by **citizen face-to-face focus groups**
- The two most commonly selected barriers by local authorities and non-local authorities to deploying connected place technologies are '**lack of funding'** and '**lack of resources/capacity'**
- A **lack of skills/technical expertise**, however, is a bigger concern for non-local authorities than it is for local authorities
- Design and implementation of the connected place is most likely to be funded from **internal funding or core budgets** but this is more important to non-local authorities than local authorities.

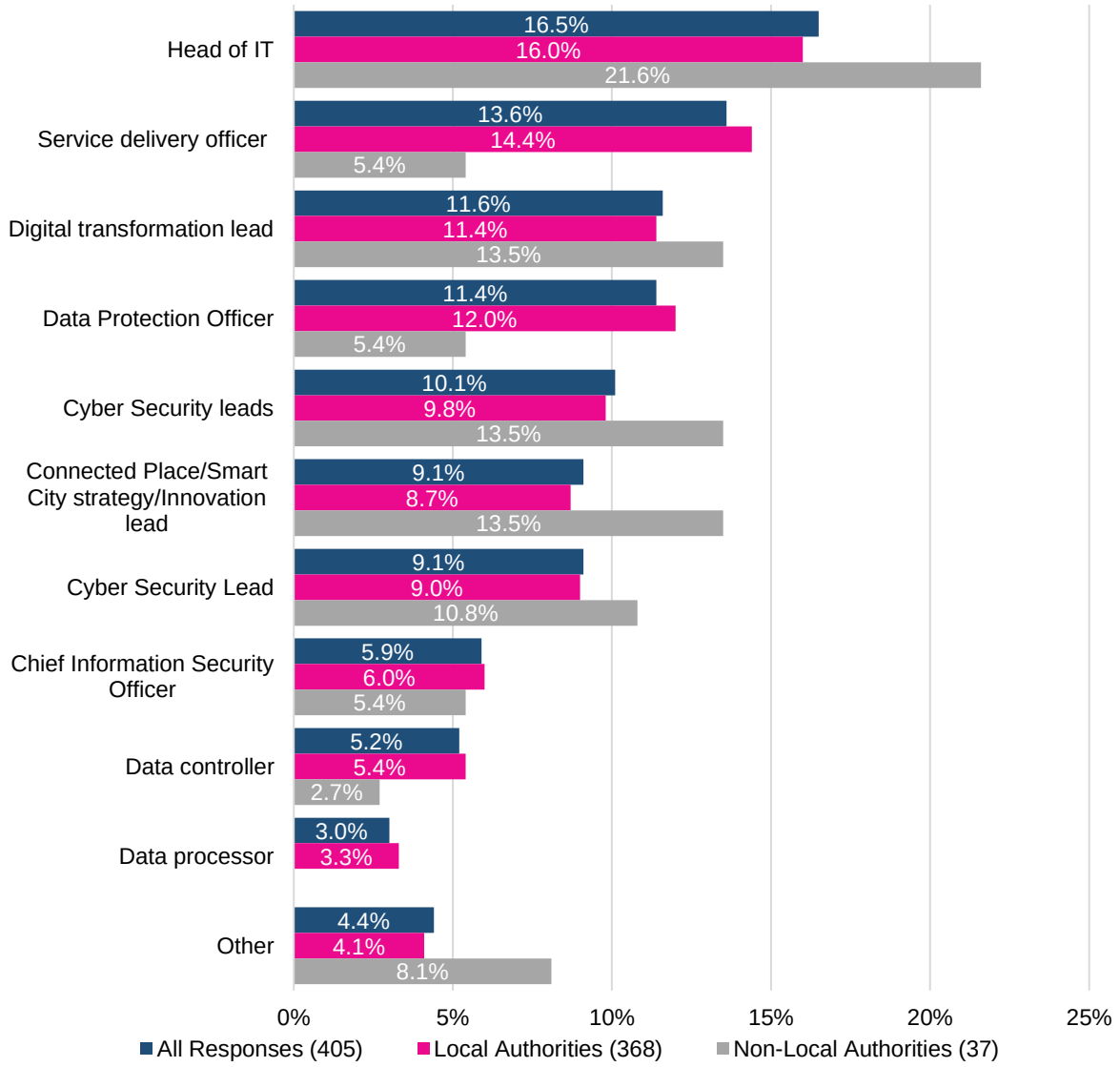
6. Governance and Management

Section 3: Respondent profile	Groups 1-4
Section 4: Strategy, technologies and features	Groups 1 and 2
Section 5: Drivers and origins	Groups 1 and 2
Section 6: Governance and management	**Groups 1 and 2**
Section 7: Cyber Security	Groups 1 and 2
Section 8: Suppliers	Groups 1 and 2
Section 9: Government support	Groups 1 and 2
Section 10: Ambition	Groups 3 and 4
Section 11: Conclusions	Groups 1-4

6.1 Involved in design, build and management of connected place

As explained in the summary of approach (section 2), the job roles that relate to connected places are still evolving and vary across organisation type. For further research purposes and to gain insight about whom to direct guidance and support material, respondents were asked to clarify job roles typically involved in connected place technology, design and build.

Figure 19: Typical job roles involved in connected place technology design and build by organisation type - *multi-response*



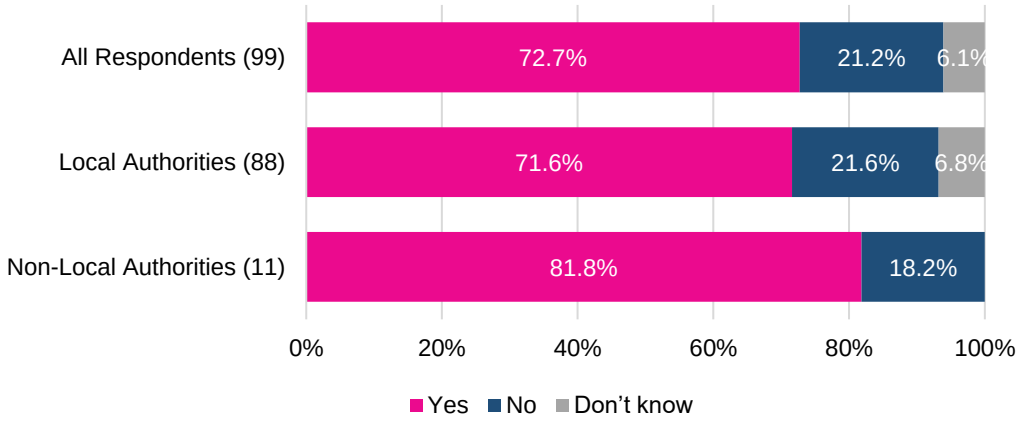
Examining individuals' job roles most likely to be involved in the design, build and management of connected place in operation indicate that 'Head of IT' (17%) is the most common, followed by 'Service Delivery Officer' (14%). Roles least frequently mentioned are 'Chief Information Security Officer' (6%), 'Data controller' (5%), and 'Data processor' (3%).

Of 18 responses selecting 'Other', six reference different IT roles with three choosing 'Head of Regeneration'. The majority of these are from Local authorities in the devolved nations.

Responding organisations from maturity group 1 more frequently select 'Connected Place/Smart City strategy/Innovation lead' (15%) than those from maturity group 2 (4%).

Those from urban with significant rural areas more commonly mentioned 'Service Delivery Officer' (17%) than respondents from predominantly urban and rural Local authorities (13%, 12%).

Figure 20: Do you have a dedicated job role for the management of cyber risk

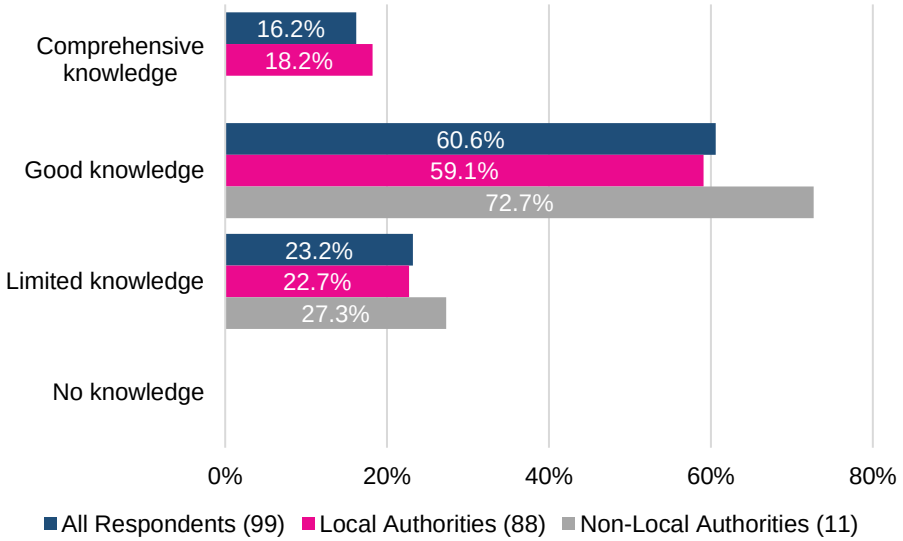


From the same base of group 1 and 2 respondents, over 70% (62) of local authorities have someone dedicated to the management of cyber risk, a role seen as equally important for the non-local authorities (82%, 9).

6.2 Level of knowledge

An important step in securing a connected place is knowing what assets, technologies and infrastructure are active across the connected place. Gaining insight into organisations' knowledge of their own connected place in this respect is important context around the governance and management of connected places.

Figure 21: Level of knowledge of the assets, technology and infrastructure



All respondents claim to have at least some knowledge of the assets, technology and infrastructure that goes into connected places. Over half (60.6%) believe their organisation has a good level of knowledge, while 23.2% describe a limited level of knowledge and around one in six (16.2%) comprehensive knowledge. Other insights include:

- maturity group 1 believe they have good knowledge (63%) slightly more often than those from maturity group 2 (56%).
- differences in perceived levels of knowledge are also evident on a regional scale with respondents in Southern England (69%) and the devolved nations (64%) indicating a good level of knowledge in comparison with Northern England (57%) and Eastern England (50%).
- respondents from predominantly rural local authorities more frequently say their level of knowledge is comprehensive (30%) compared with urban with significant rural Local authorities (19%) and predominantly urban local authorities (13%).
- those who implemented their connected place technologies more than five years ago claim a limited level of knowledge compared to others.

6.3 Summary – Governance and Management

Maturity groups 1 and 2 – with or without a connected places strategy in place but manage connected places technologies (base: 100 but the base varies slightly across questions)

Summary

- Job roles most likely to be involved in the design, build and management of connected place are '**Head of IT'** followed by '**Service Delivery Officer'**
- Responding organisations from maturity group 1 more frequently select **'Connected Place/Smart City strategy/Innovation lead'** as a job role than those from maturity group 2
- Over half of respondents believe their organisation has a **good level of knowledge**, with just under a quarter describing their organisation/department as having a **limited level of knowledge**

7. Cyber Security

Section 3: Respondent profile	Groups 1-4
Section 4: Strategy, technologies and features	Groups 1 and 2
Section 5: Drivers and origins	Groups 1 and 2
Section 6: Governance and management	Groups 1 and 2
Section 7: Cyber Security	**Groups 1 and 2**
Section 8: Suppliers	Groups 1 and 2
Section 9: Government support	Groups 1 and 2
Section 10: Ambition	Groups 3 and 4
Section 11: Conclusions	Groups 1-4

7.1 Steps to ensure appropriate levels of cyber security

Of the 100 organisations in maturity groups 1 and 2 who currently manage connected place technologies or solutions, 93 set out, in an open format, the steps they have taken to ensure appropriate levels of cyber security. Of the remaining seven others, four said none, one cannot share, and one does not know. The seventh left this blank.

Analysis of those open responses indicate steps such as:

- use of internal policies, specifically that the cyber security or IT department develops and implements policies designed to offer appropriate levels of protection.
- following the guidance from NCSC regarding best practice throughout the design, build and management of connected places technology.
- outsourcing their cyber security needs, using external companies to design, build and/or manage the connected places solutions.
- noting that digital investments are subject to a data protection impact assessment (DPIA).
- everything is made secure by ensuring appropriate network segmentation and firewalling is in place.
- Public Sector Network (PSN) compliance, penetration testing (PEN), cyber essentials accredited, using approved vendors or individual risk assessments.

'We have a technical working group that impact assesses all new technologies and systems that the council utilises'

Local authority, Devolved nation

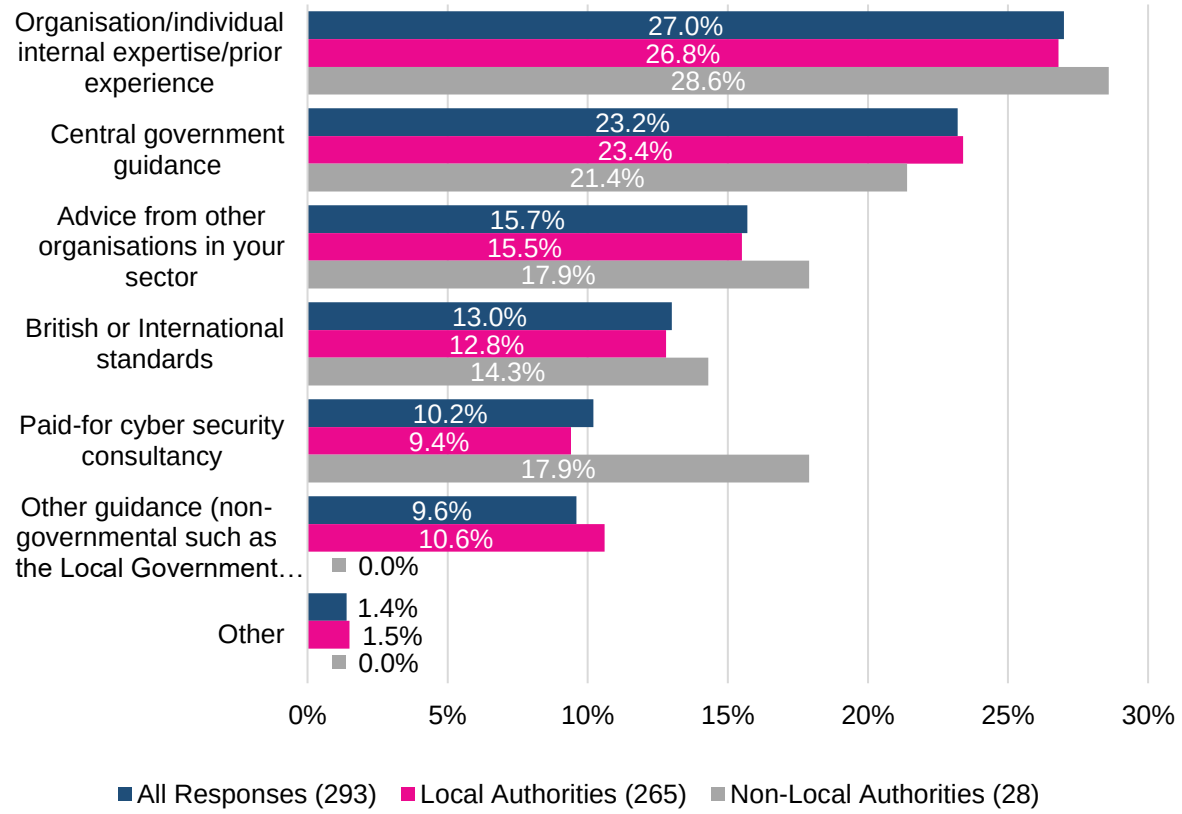
'Numerous steps have been taken to ensure the appropriate levels of cyber security are taken which includes giving consideration to industry standards, adopting guidance from the NCSC, regular penetration testing, and regular technical audits.'

Local authority, Southern England

7.2 Resources to determine effective security controls and measures

The 100 organisations from maturity groups 1 and 2 were asked, from a list of six resources (guidance or expertise in various forms), to select all the resources used to ensure effective security controls and measures for governing their connected place.

Figure 22: Selection of resources used to determine effective security controls and measures - *multi-response*[6]



Responses from those in maturity groups 1 and 2, indicate the top resource (27%) to determine effective security controls and measures is 'organisation/ individual internal expertise/prior experience'**.** Slightly less (23.2%) mention 'central government guidance' with the least used resource being 'other non-governmental guidance' (9.6%).

- among organisations that have implemented technologies in the last year, 38% mention using internal expertise.

[6] Where the data refers to 'other guidance (non-government such as the Local Government Association)', it should be noted that the Local Government Association largely acts as a signposting organisation with regards to cyber security guidance.

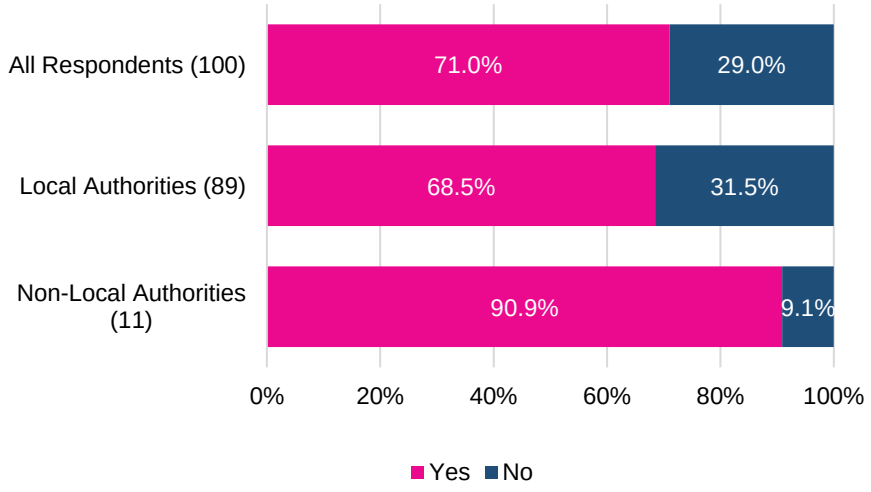
- for non-local authorities, paid-for cyber security consultancy is a higher used resource (18%) than for local authorities (9%).
- 10% of local authorities use other guidance (non-governmental) – an option not selected by non-local authorities.

Other resources include attending Smart Infrastructure 'show and tell' events, using an internal Technical Design Authority and connected place technology vendors.

7.3 Possession of organisational incident response procedures in place

This part of the focus on security looks at organisational incident response procedures including any specific measures in the event the connected place systems and services are compromised or exposed in order to establish how many from maturity groups 1 and 2 have such procedures in place.

Figure 23: Existence of organisational incident response procedures



Of the 100 responding organisations, 71% report having incident response procedures in place, including specific measures in case their connected place systems and services are compromised.

Although again a much smaller base, 91% of the 11 non-local authorities in maturity groups 1 and 2 indicate they do have such procedures.

- those implementing connected place technologies 3-4 years ago (77%) report having incident report procedures in place in greater number than organisations which implemented such technologies within the last year (63%), 1-2 years ago (70%), or 5+ years ago (65%).

Of the 71% of respondents who do have incident procedures in place, further examples provided include a management plan highlighting processes to be followed in the event of various incident types.

7.4 Summary – Security

Maturity groups 1 and 2 – with or without a connected places strategy in place but manage connected places technologies (base: 100 but the base varies slightly across questions)

Summary

- 93% of respondents can describe the steps they have taken to **ensure appropriate levels of cyber security**
- '**Organisation/ individual internal expertise/prior experience'** is regarded as the top resource to determine effective security controls and measures
- 71% report having **incident response procedures in place**, including specific measures in case their connected place systems and services are compromised

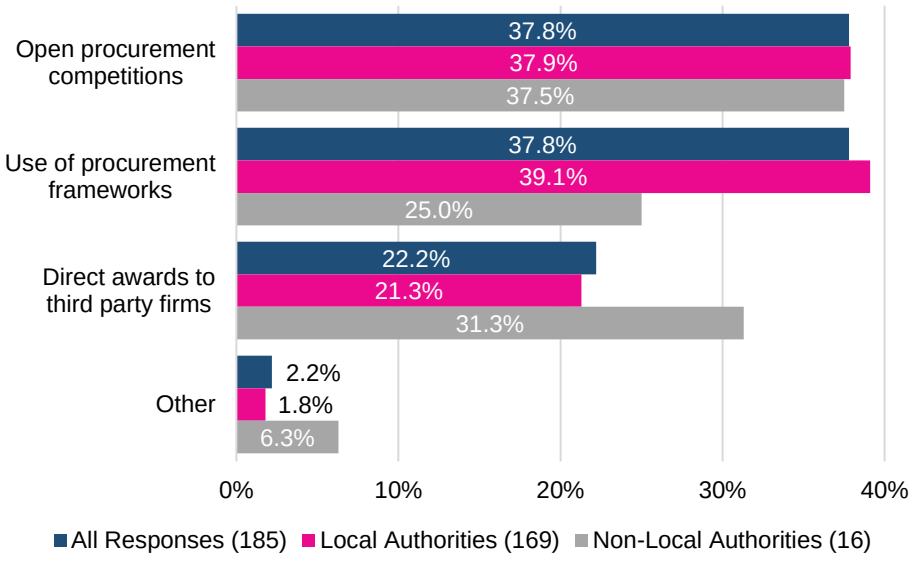
8. Suppliers

Section 3: Respondent profile	Groups 1-4
Section 4: Strategy, technologies and features	Groups 1 and 2
Section 5: Drivers and origins	Groups 1 and 2
Section 6: Governance and management	Groups 1 and 2
Section 7: Cyber Security	Groups 1 and 2
Section 8: Suppliers	**Groups 1 and 2**
Section 9: Government support	Groups 1 and 2
Section 10: Ambition	Groups 3 and 4
Section 11: Conclusions	Groups 1-4

8.1 Procuring the technology and services to run a connected place

From a choice of three options (plus 'other'), 99 respondents from maturity groups 1 and 2 indicated how they procure the technology and services to run a connected place.

Figure 24: Routes to procurement



Procurement competitions and procurement frameworks equally are the most common route to procurement.

A quarter of non-local authorities make use of procurement frameworks.

There are others who individually say either, they currently have a jointly funded network with the supplier, or they are part of a consortium of local authorities. There were four respondents who selected 'other' and provided further comments. Of these, one local

authority said they do not know how they procure because it is overseen by another department.

8.2 Procurement frameworks used

A total of 70 surveyed organisations say that they use between one and four procurement frameworks, with the average being two. Some 66 respondents gave further detail on which frameworks they use.

- Half use Crown Commercial Services (CCS), especially among local authorities.
- A further 31 say they use G-Cloud – most frequently local authorities from predominantly rural areas.
- SPARK is used by six responding organisations. Other mentioned frameworks include Digital Marketplace, DOS, TTAS, DPS, LGRP, CHEST, EPSO and Scottish National Procurement frameworks.

8.3 Minimum procurement threshold for using procurement frameworks

Respondents are almost equally divided in terms of those having no fixed or minimum threshold for using procurement frameworks, and those setting a minimum contract value threshold of £10,000 plus.

Table 7: Minimum procurement thresholds

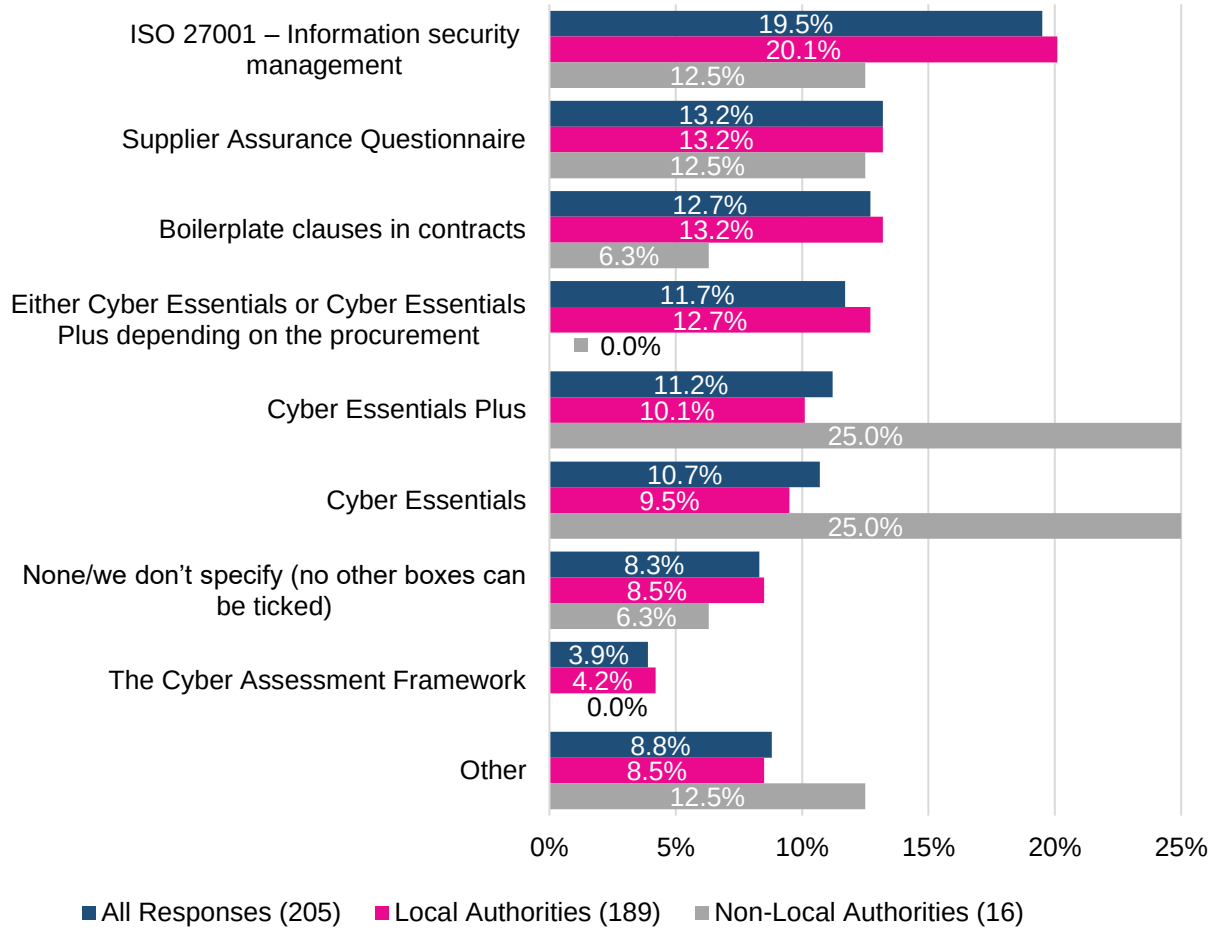
	All Respondents (69)	Local Authorities (65)	Non-Local Authorities (4)
No fixed or minimum threshold	46%	46%	50%
Less than £10,000	6%	6%	-
£10,000 and over	48%	48%	50%

Local authorities from predominantly rural areas (64%) more frequently cite having no fixed or minimum threshold than those local authorities that are urban with significant rural (48%) or predominantly urban (39%).

8.4 Minimum cyber security requirements in place for suppliers

Responses from maturity groups 1 and 2 indicate a mix of approaches to set minimum cyber security requirements of suppliers.

Figure 25: Minimum cyber security requirements *-multi-response*



As a multi-response question, respondents are able to select all that apply to their organisation or department. Of all the choices provided, 8.3% of responses said that none of these minimum requirements are in place – a figure not far short of a tenth of all responses.

The most common answer (accounting for a fifth of responses) is ISO 27001 Information Security Management (not a specific standard for connected places or cyber security but for information security) although this is noticeably lower in the devolved nations at 12% of responses.

The next most commonly mentioned approaches are Supplier Assurance questionnaires at 13.2% and boilerplate clauses in contracts (12.7%) of responses.

A total of 18 organisations chose 'other'. Almost half say they carry out their own assessment depending on the systems in use and the data held. Five are located in urban with significant rural local authorities, whilst three are based in the devolved nations.

'We also have our own cyber assessment that we ask all suppliers to complete before we enter into any contract with them'

Local authority, Devolved nation

Other responses include Service Organisation Control 2 (SOC2), Public Services Network compliance (PSN), Cloud Essentials, Cloud Service Providers (CSPs), Public Contracts Scotland, whilst two do not know, one is currently developing its requirement and one does not specify a minimum.

8.5 Assurance procedures to ensure suppliers have adequate cyber security measures

Based on 99 responses to this specific question about the existence of assurance procedures, over half (61%) of maturity groups 1 and 2 organisations have procedures in place to ensure suppliers have adequate cyber security measures. However, it is noteworthy that 39% do not have procedures in place but point out that they have ambitions to do so in the future.

Where details are provided, these can be summarised from the 47 freeform responses provided as follows:

- Service Level Agreements (SLAs) are put in place to minimise cyber-attacks and ensure infrastructure operates effectively.
- a cyber assessment for IT systems and external facing IT equipment before entering into contracts.
- penetration testing during set up and implementation of systems.
- a reporting mechanism in place for cyber security incidents.
- suppliers are asked to sign up to the local authority's security principles.

Other assurance procedures include a supplier survey questionnaire, a contract management policy, PSN certification, a third-party access policy, controller processor agreements, IT Service Management (ITSM), Service Organisation Control 2 (SOC2), Data protection impact assessments (DPIA) and external monitoring.

8.6: Split of roles and responsibilities between buying-organisation and supplier regarding cyber security risks

In total, 64% (64) respondents in maturity groups 1 and 2 felt that the division of roles and responsibilities is clear between buyer and supplier whilst 46% of respondents do not.

Recurring comments and issues from the 45 respondents who provided further detail in freeform text boxes about their response are described below. Many of the comments made point to challenges despite their response being in the affirmative.

- they work closely with suppliers and have seen no challenges so far (5),
- there needs to be greater clarity in the contractual obligations of their suppliers because the buyers need reassurance that those commitments are being met (5),
- skills or expertise is lacking among suppliers to address specific cyber security risks (5).

'Contractual agreements can be made and assured - for example given assurance on Penetration Testing - but then we cannot guarantee that these are always carried out. Does the reality meet the contractual commitment?'

Local authority, London

Four local authority respondents are at an early stage in deploying technology for connected places and do not feel they are well placed yet to offer feedback.

'We have not yet encountered significant challenges - perhaps because we are at an early stage on the connected places journey.'

Local authority, South East

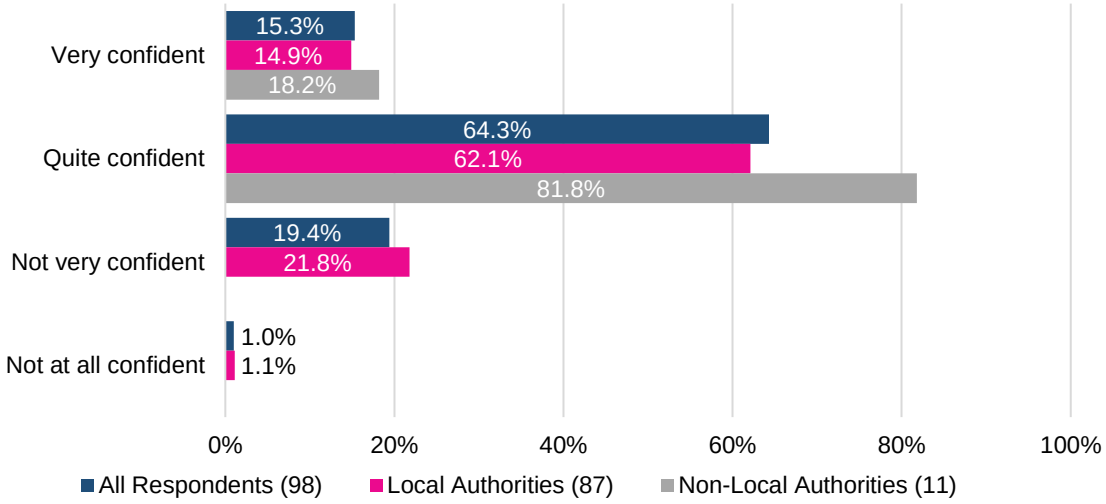
Three local authorities say it is complicated by the complexity of overlapping roles and responsibilities within organisations; and a further three comment that procurements can be completed and awarded without relevant technical / IT involvement.

There are further and some similar concerns in the following areas: accountability of suppliers, meeting contractual obligations, a lack of national guidance, the skillsets of suppliers, suppliers being reluctant to supply evidence of breaches and a lack of transparency amongst suppliers. Other comments include concerns on a number of aspects about suppliers: suppliers not committing to the standards, a lack of transparency, issues around data security, information governance and the ownership of data, or sometimes simply not having a point of contact.

8.7 Confidence in identifying and managing cyber security risks

The majority (64%) of the 100 respondents in maturity groups 1 and 2 say they are quite confident in being able to identify and manage cyber security risks.

Figure 26: Levels of confidence in identifying and managing cyber security risks



All non-local authorities are quite or very confident. 21.8% of local authorities said they do not feel very confident, with just one local authority suggesting they are not at all confident.

8.9 Summary - Suppliers

Maturity groups 1 and 2 – with or without a connected places strategy in place but manage connected places technologies (base: 100 but the base varies slightly across questions)

Summary

- **Procurement competitions and procurement frameworks** are the most common ways of engaging suppliers for connected places
- Most organisations use between **one and four procurement frameworks**, with the average being two.
- The most common minimum cyber security requirement for suppliers is **ISO 27001 (an Information security management standard)**
- **61%** of organisations have procedures in place to ensure suppliers have adequate cyber security measures.
- **39%** have no procedures in place but have ambitions to do so
- **64%** of respondents see the division of roles and responsibilities regarding cyber security as clear between buyer and supplier. But **46%** do not regard the split of roles and responsibilities as clear.
- **80%** of organisations say they are quite or very confident in being able to identify or manage cyber security risks

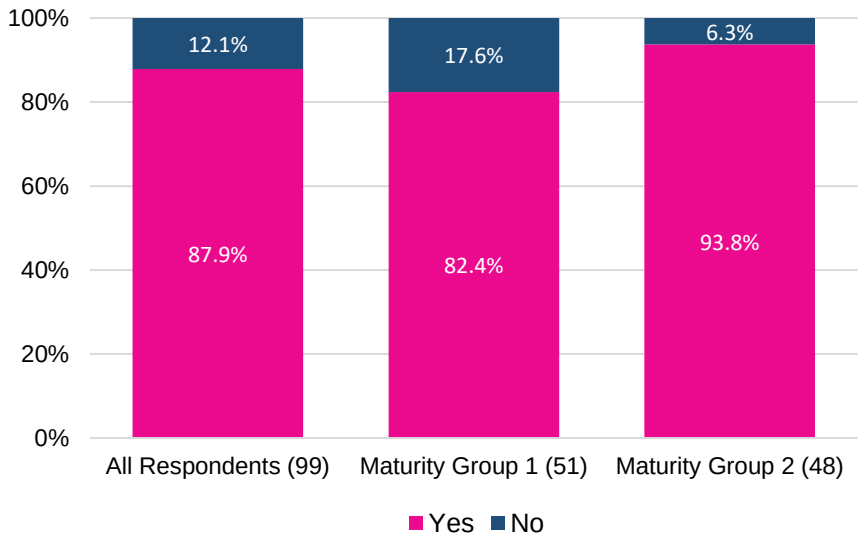
9. Government Support

Section 3: Respondent profile	Groups 1-4
Section 4: Strategy, technologies and features	Groups 1 and 2
Section 5: Drivers and origins	Groups 1 and 2
Section 6: Governance and management	Groups 1 and 2
Section 7: Cyber Security	Groups 1 and 2
Section 8: Suppliers	Groups 1 and 2
Section 9: Government support	**Groups 1 and 2**
Section 10: Ambition	Groups 3 and 4
Section 11: Conclusions	Groups 1-4

9.1 Awareness of specific guidance

Respondents were asked if they are aware of two examples of government guidance on the security of connected places, one produced by the National Cyber Security Centre (NCSC) and one by the Centre for the Protection of National Infrastructure (CPNI).

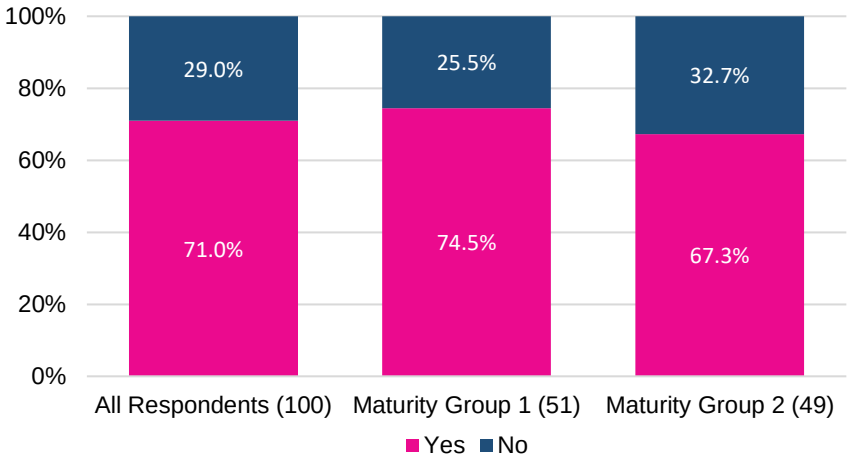
Figure 27: Awareness of government guidance by maturity group



The majority (87.9%) of respondents in maturity groups 1 and 2 report being aware of government guidance on the security of connected places.

Awareness is slightly greater among maturity group 2 respondents (93.8%) – those without a connected place strategy in place, those from the Midlands and Eastern England (95.5%), and predominantly rural local authorities (94.4%). Around one in ten say they are not aware of such guidance.

Figure 28: Read the NCSC's Connected Places Cyber Security Principles by maturity group



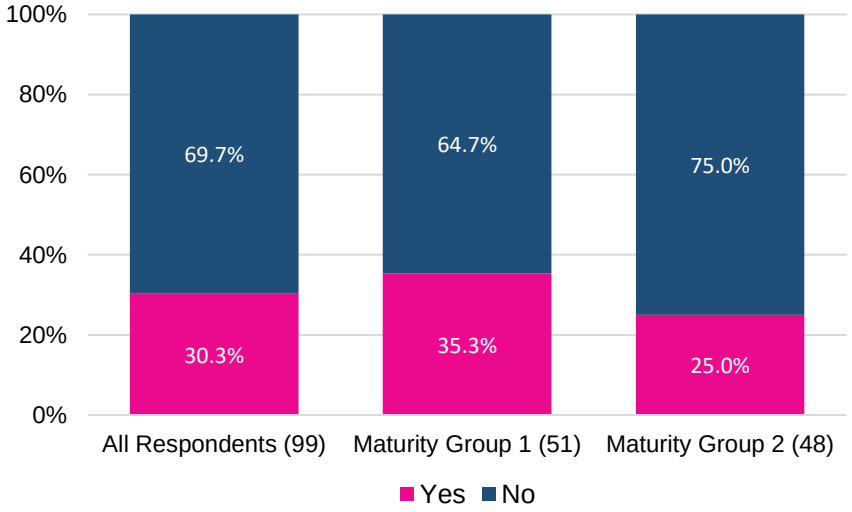
Over two thirds of respondents (71%) have read the NCSC's Connected Places Cyber Security Principles, but 29% have not.

- Of those who have read the NCSC Principles, most are local authorities (75%) compared to non-local authorities (36%).

Of the 11 respondents who provided additional (freeform) feedback on the NCSC Principles, seven found them to be helpful, comprehensive and clear. Other comments suggest the Principles are welcome but they need to be promoted further. Ten of these respondents are from local authorities.

Approximately 70% of respondents said they are not aware of PAS185 (especially non-local authorities).

Figure 29: Are you aware of PAS 185- a specification for establishing and implementing a city-wide strategic level, security mind approach by maturity group by maturity group



Awareness varies across the nation amongst local authorities and is greatest among organisations that implemented connected place technologies 5+ years ago (44%) compared with those implementing such technologies within the last year (32%).

Over three fifths of respondents (61.2%) have not visited the Secure Connected Places Guidance Collection, compared to 38.8% that have. A high proportion of non-local authorities (80%) have not visited the collection.

Among respondents who have visited the collection and provide freeform feedback (6 respondents), three mention the guidance to be useful and straightforward. Others suggest it should be promoted further and would benefit from an overarching model to help those entering this field to navigate the collection.

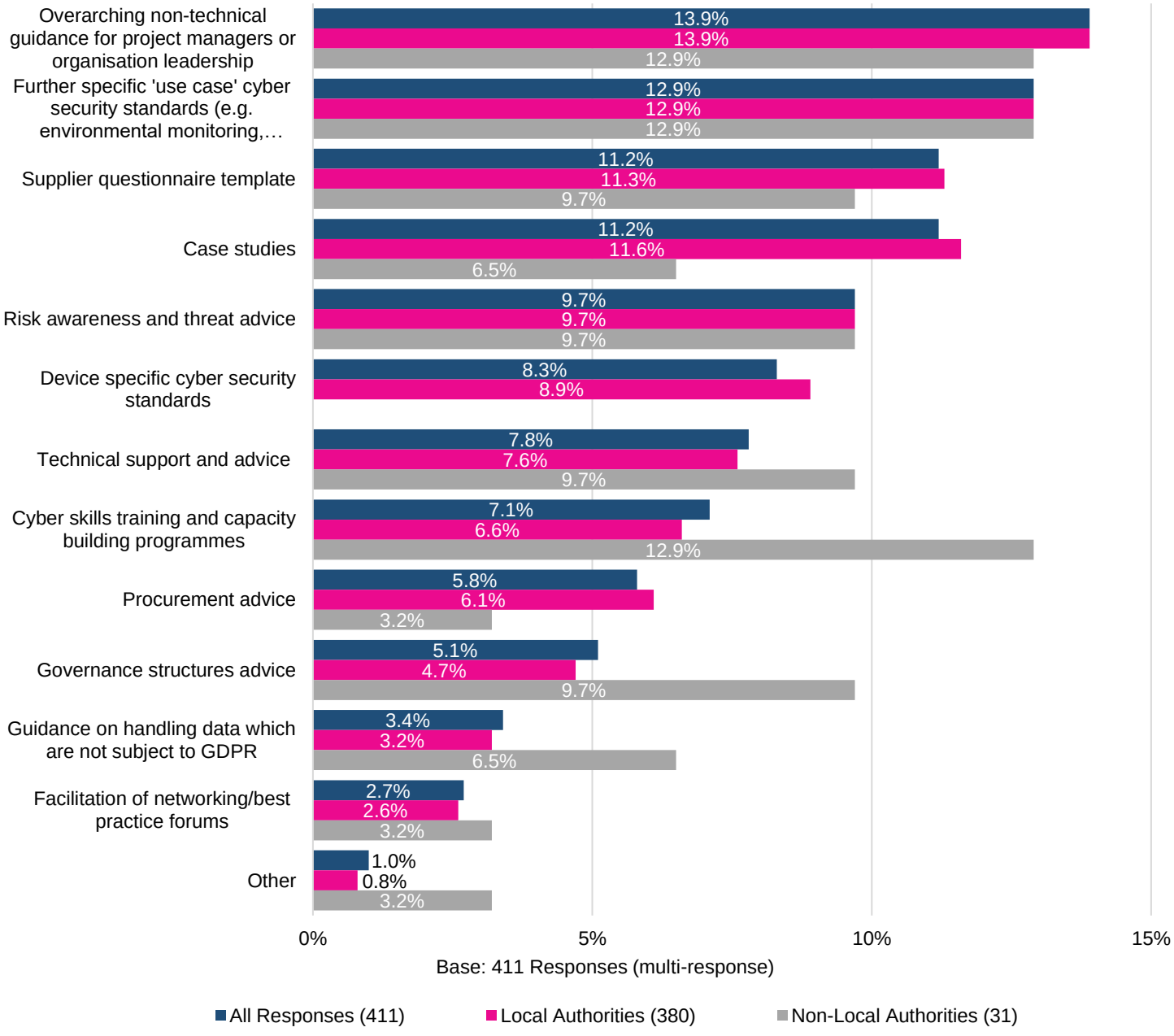
9.2 Further guidance and support respondents would find most helpful to ensure their connected place is secure.

Respondents were asked what further guidance and support from government they would find most helpful.

The most commonly selected further guidance and support, includes overarching non-technical guidance for project managers or organisation leadership (13.9%), followed by specific ‘use case’ cyber security standards including environmental monitoring, smart waste and traffic management (12.9%).

Some less frequently referenced guidance materials include device-specific cyber security standards, technical support and advice, cyber skills training and capacity building programmes, amongst others.

Figure 30: Choice of helpful types of guidance and support – *multi-response*



Respondents from local authorities more commonly select case studies (12%) than those from non-local authorities (6.5%). On the other hand, respondents representing non-local authorities are looking for governance structures advice, cyber skills training and capacity building programmes compared to local authorities.

Four respondents selecting 'Other' are looking to dovetail security of connected place with the PSN code of connection in local authorities or seeking greater levels of funding, more information, and agreed standards for data integration.

9.3 Summary – Government support

Maturity groups 1 and 2 – with or without a connected places strategy in place but manage connected places technologies (base: 100 but the base varies slightly across questions)

Summary

- **88%** of respondents in maturity groups 1 and 2 report being aware of government guidance on the security of connected places
- **70%** have read the NCSC's Connected Places Cyber Security Principles
- **70%** say they are not aware of PAS185 (especially non-local authorities)
- **61%** have not visited the Secure Connected Places Guidance Collection
- **14%** request further guidance and support to ensure respondents' connected place is secure in overarching non-technical guidance for project managers or organisation leadership

10. Ambition (maturity group 3)

Section 3: Respondent profile	Groups 1-4
Section 4: Strategy, technologies and features	Groups 1 and 2
Section 5: Drivers and origins	Groups 1 and 2
Section 6: Governance and management	Groups 1 and 2
Section 7: Cyber Security	Groups 1 and 2
Section 8: Suppliers	Groups 1 and 2
Section 9: Government support	Groups 1 and 2
Section 10: Ambition	**Groups 3 and 4**
Section 11: Conclusions	Groups 1-4

The following questions were asked only of maturity group 3, making up those respondents who answered 'no' to managing connected places technology, but 'yes' to the ambition to do so – totalling 73 respondents.

10.1 Important factors in driving ambitions to implement or procure connected place technologies

The 73 respondents were asked to rank the relative importance of five factors driving their ambitions to implement or procure connected place technologies, from first to fifth place.

Following the application of weightings[7], the most to least important drivers (denoted by highest – up to 5 to lowest average scores – down to 1 respectively) are set out below.

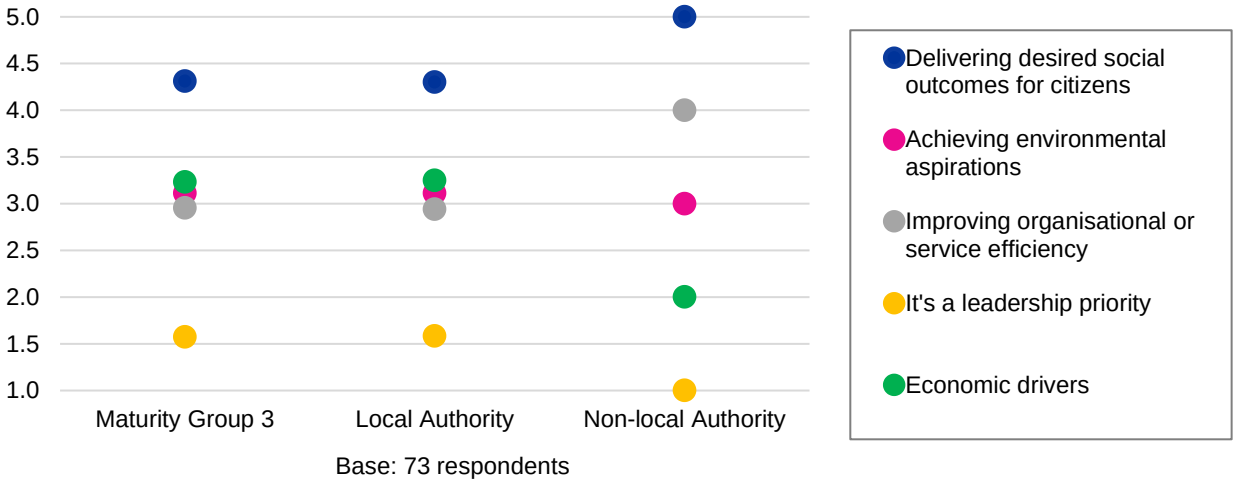
Table 8: Drivers for their ambitions

Drivers	Average ranking after weighting applied
Delivering desired social outcomes for their citizens such as improved mobility or improved resident experiences	4.3
Economic drivers such as delivering cost effective solutions or making their place attractive to business	3.2
Achieving environmental aspirations	3.1
Improving organisational or service efficiency	3.0
It's a leadership priority	1.6

[7] This question asked each respondent to rank their choices from 1 being 'most important' to 5 being 'least important'. For each statement, inverse weighting factors have been applied, i.e. the total number of respondents giving a '1' rating was multiplied by 5; the total number giving a '2' rating was multiplied by 4, and so on. In the chart therefore, the highest average ranking is the most preferred option, down to the lowest average ranking being the least preferred option.

The top ranked driver and the lowest ranked driver are in the same positions as for maturity groups 1 and 2 but efficiency is ranked 3.4 by respondents in maturity groups 1 and 2, higher than by maturity group 3 (3.0). Environmental aspirations is very slightly more important a driver for group 3 (ranked 3.1 as opposed to 3.0 for maturity groups 1 and 2).

Figure 31: Drivers for implementing technologies or solutions by group



Base: 73 respondents

Other important factors that 30 respondents (largely from local authorities) mention - in freeform responses - as driving ambitions in using connected places technologies. These range from:

- To better serve the local population
- Better connectivity (mobile and broadband coverage)
- Forging partnerships - either with specific partner organisations in the region, or with local government advice and guidance.

Two respondents explain there are no specific factors at present with one saying “other councils are doing it”.

Another two Local authorities suggest that their organisation’s digital strategy is a factor in their ambition, suggesting that connected places technologies are forming a key part of the local authorities’ overall digital strategy and encouraging the whole organisation to improve their technology platforms.

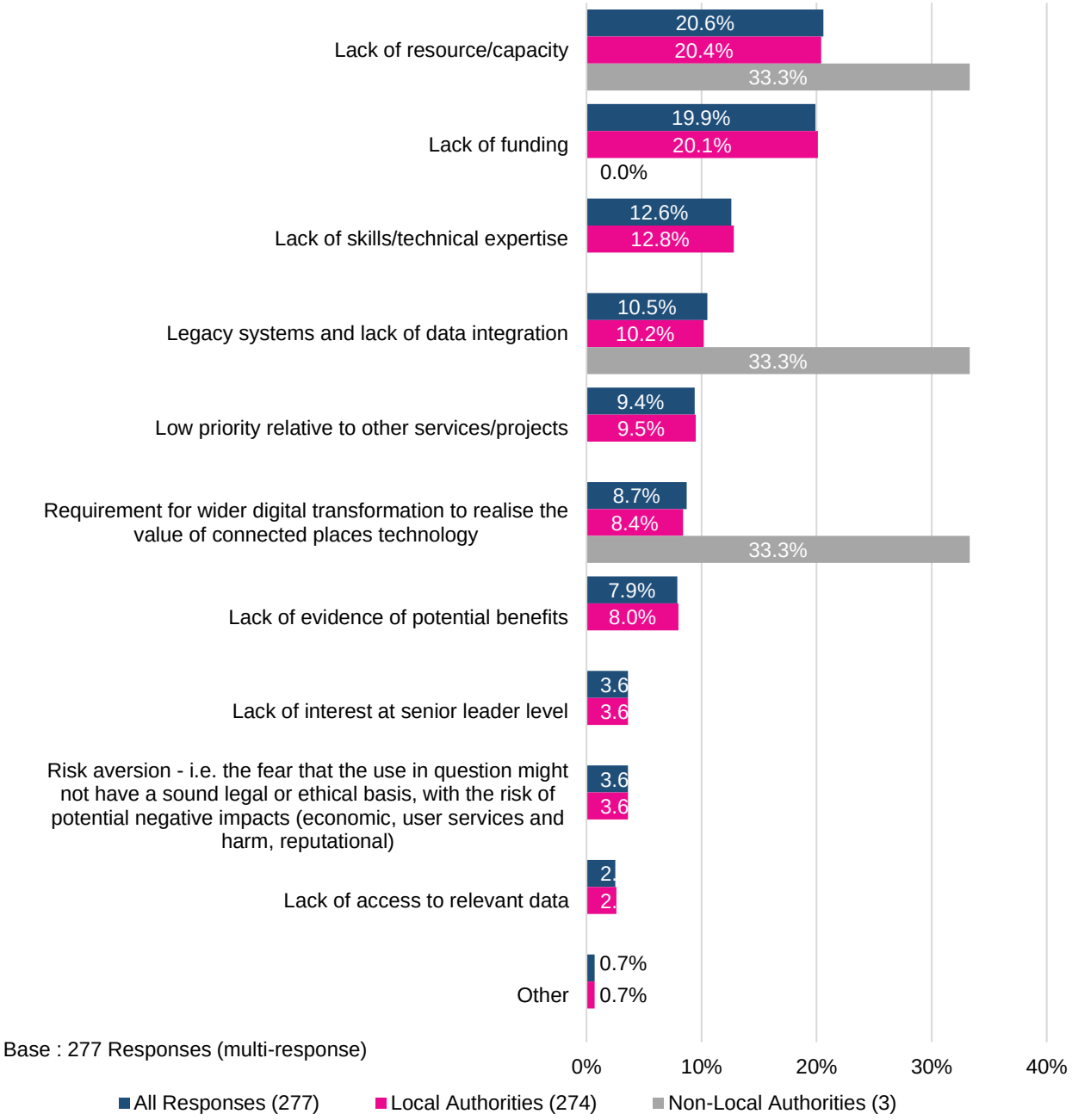
Another two mention that they want to be the leading authority in the area. A small council that is surrounded by other small councils explain they suffer from too much competition to recruit for their services and ambitions, recognising that connected places technologies might help give them an edge to combat this issue.

For two others, factors behind their ambition in connected places technology are the care needs of elderly or vulnerable residents in their urban setting and wanting to reduce residents’ digital exclusion.

10.2 Biggest barriers in deploying connected places technologies

In slight contrast to those who are managing connected places technologies (maturity groups 1 and 2 – see section 5.4) the biggest barriers among maturity group 3 respondents are: lack of resources and capacity (20%), then a lack of funding (19%), in other words the same top two barriers, but inverted.

Figure 32: Biggest barriers to deploying connected place technologies (maturity group 3) - *multi-response*

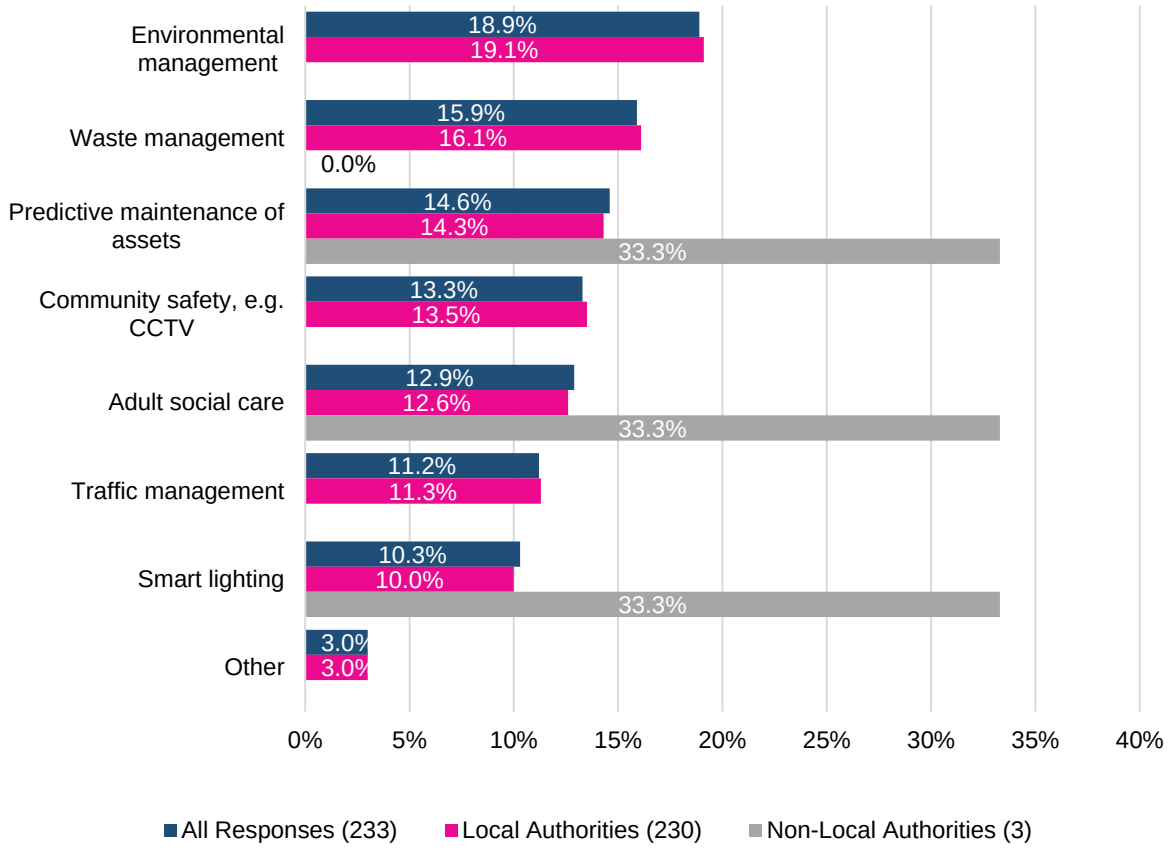


10.3 Interest in use cases as part of ambitions

Those 73 respondents who say that they do have ambitions to manage connected places technology were asked which use cases they were interested in exploring as part of their ambitions.

A total of 233 responses were gathered via a multiple-choice question.

Figure 33: Interest in the following use cases - *multi-response*



The most commonly mentioned use cases are environmental management (18.9% of all responses) followed by waste management (15.9%) and predictive maintenance of assets (14.6%). This contrasts with those who are already managing connected places technologies whose most common use case in terms of public service is Community Safety (19.7%). Waste management (12.4%) and predictive maintenance of assets (6.5%) figure much less as use cases for those in maturity groups 1 and 2.

Among non-local authorities, three use cases were mentioned and responses were divided equally in thirds between predictive maintenance of assets, adult social care, and smart lighting.

Other insights include:

- ambition to deploy connected place technologies is slightly higher (39.7%) with urban with significant rural local authorities than other types of predominantly urban and predominantly rural local authorities (28.7, 28.7%).
- ambition including environmental management appears to be of interest more in the Midlands and North than in the South and devolved nations.
- adult social care is a use case of interest in the North more than in the Midlands or the South.

The 7 respondents that answered 'other' gave additional comments for the use cases they were interested in. In no particular order, those were: Wi-Fi and smart towns, the Connected Forest project, smart office sensors (for capacity), public convenience monitoring, place data hub, utility use & availability, electric vehicles, and 5G.

These responses labelled 'other' fall under a category of connectivity, whether that be through free Wi-Fi initiatives or a 5G connectivity project such as Connected Forest.

10.4 Timeline to deliver the first feature

Among local authorities, 40% (28) do not yet have a timeline to deliver the first feature of their connected place, however 31% (22) said that it will take just between one and three years for their first feature to be delivered. A further 20% (14) of local authorities said that it would take between three and five years to do so.

Table 9: Timeline to deliver the first feature

	All Respondents (71)	Local Authorities (70)	Non-Local Authorities (1)
<1 year	7.0%	7.1%	-
1-3 years	31.0%	31.4%	-
3-5 years	19.7%	20.0%	-
5-10 years	1.4%	1.4%	-
We don't have a timeline yet	40.8%	40.0%	100.0%

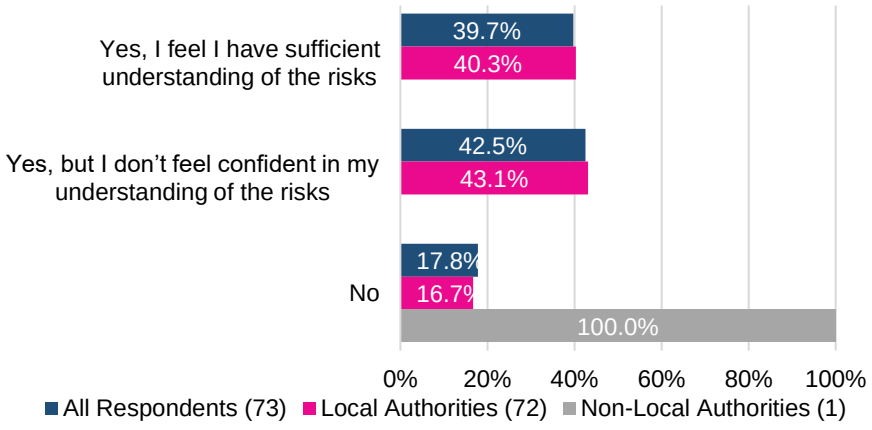
One predominantly urban local authority located in Northern England believes that their first feature would be implemented within five to ten years and was the only local authority to say their timeline was this long. None of the local authority respondents from the Midlands and Eastern England plan for their projects to go live within the year.

- Predominantly rural local authorities most commonly mention that their first feature would be ready within the year (10%, 2), or between one and three years (38%, 8).

10.5 Consideration of cyber security risks

Respondents were asked whether they had considered the cyber security risks in their connected place ambitions.

Figure 34: Consideration of cyber security risks that might be involved



The response was almost equally split between those having understanding of the risks 40% (29) and yes they had considered them but they did not feel confident in their understanding of the cyber security risks 42% (31). Of those saying no they had not considered the risks, twelve (16%) are local authorities. One non-local authority explained that they had not considered the cyber security risks.

10.6 Management of cyber security risks

Respondents were asked *how* they might manage the cyber security risks of their connected place, with 45% of the 71 maturity group 3 local authorities saying they have considered this. Only one non-local authority responded to this question, and they have not considered management of cyber security.

In further details that were supplied in freeform text boxes, local authorities reference their internal teams and external solutions for operations that provide guidance, approve, and evaluate cyber security:

- three Local authorities made specific reference to advice bodies, such as the NCSC and the CPNI, for guidance when implementing cyber security and minimising risks.

- one local authority based in Northern England has developed its own Cyber and ICT Security Strategy, monitored by an internal Digital Governance team, assuring valid business cases which include risk assessments for approval through their programme and project gateways.

- two local authorities made specific reference to internal teams responsible for the maintenance of cyber security, including employing Information Security Officers, as well as security and ICT teams that work alongside external suppliers and vendors. However, one referenced a difficulty in hiring an internal security team with the specific technical skills required for connected places cyber security, therefore limiting the size of their network team to five.

The 43% (30) of local authorities that said they are aware, but are not confident, of their understanding of cyber security risks, and have fewer substantial measures in place for present and future projects. Two local authorities are in the process of developing protocols and measures, with one having attended the LGA Tech Essentials Connected Places Briefing in November 2021, and another is developing an internal security operations centre to manage cyber security risks:

- two local authorities made specific reference to conducting Data Protection Impact Assessments (DPIA) for each implemented tech initiative and project deployment, whilst another is continuously adjusting their controls as published advice changes and matures.

Local authority respondents not confident at all in their understanding of cyber security risks have fewer purpose-built cyber security and IT departments to handle connected place security than those who are confident.

Respondents as a whole said that they work closely with internal and external providers to develop and maintain their cyber security for connected places, and directly follow changing advice published by institutions such as the NCSC's Connected Places Cyber Security Principles and the Centre for the Protection of National Infrastructure (CPNI). This includes

the single organisation that has not considered cyber security risks associated with their connected place ambitions.

Three local authority respondents are seeking to further develop their systems in place through hiring their own security teams or working with external providers to manage security risks. The greatest challenge faced by these organisations is sourcing the financial and skills investment to deliver a successful cyber security team.

10.7 Use of government guidance

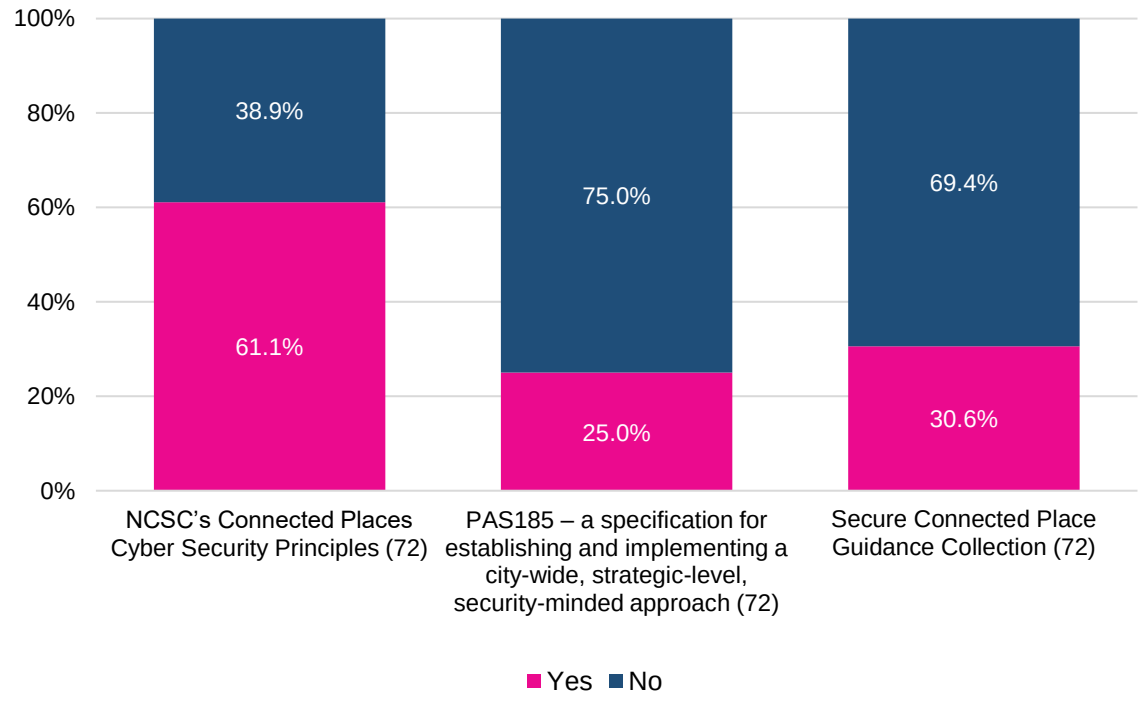
The maturity group 3 respondents were asked whether they plan to consult government guidance on the security of connected places, 94% of the local authority respondents say they are planning on consulting guidance, as did the one non-local authority respondent.

Four respondents say they are not planning to refer to guidance, and this was highest amongst devolved nation local authorities.

Only two respondents gave further details about why they are not planning to check government guidance: one says their approach is not developed enough to consult on, while the other had not realised that support was available.

Respondents were asked about their awareness of government guidance prior to completing the survey.

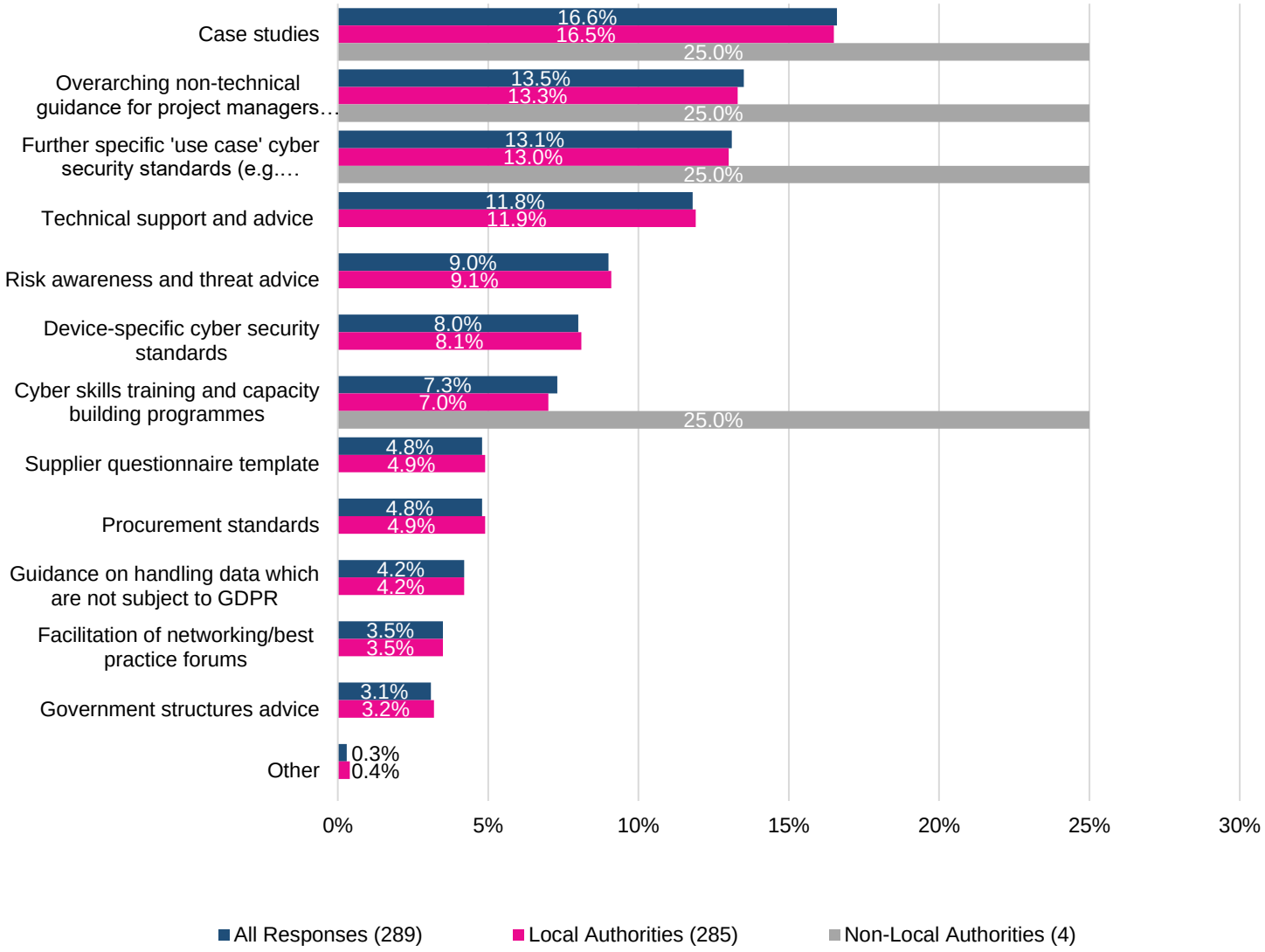
Figure 35: Awareness of Guidance prior to completing the survey



Awareness for maturity group 3 respondents varies according to the type of guidance with the highest levels of awareness for NCSC's Connected Places Cyber Security Principles at over 60%. This compares to respondents in maturity groups 1 and 2 where nearly 88% report being aware of government guidance on the security of connected places.

Further to this maturity group 3 respondents were asked about further guidance and support they would find most helpful as they deliver their ambitions to ensure the security of their connected place.

Figure 36: Helpful guidance requested to ensure the security of a connected place (maturity group 3) *-multi-response*



The most commonly selected (of five options) further guidance and support to ensure respondents' connected place is secure for maturity group 3 is case studies (16.6%). The second highest request is overarching non-technical guidance for project managers or organisation leadership (13.5%), almost exactly the same as for maturity groups 1 and 2 responses.

10.8 Concerns and further details

A total of 15 respondents indicated 'no' to currently managing connected places technology and having the ambition to do so. These respondents are categorised as maturity group 4 and are a mix of local authorities and non-local authorities.

Of those in maturity group 4, 5 (4 local authorities) say they have concerns about doing so. Two respondents, both in the Midlands and Eastern England regional cluster, feel that

resources are a concern. Without extra resources to dedicate to this technology, they can only allocate the resources they do have to tried and tested approaches.

Local authorities in this maturity group would want to perform a cost-benefit analysis to be sure the benefits would outweigh the costs before implementing these technologies. A local authority in Northern England suggested that restructuring of local government would put other priorities at the forefront over connected place technologies.

10.9 Summary – Ambitions/Concerns (maturity group 3)

Maturity group 3 - may or may not have a strategy but they do not manage connected place technologies but have an ambition to do so. (base: 73 but the base varies slightly across questions)

Summary

- At 4.3 out of 5 the highest ranked driver of ambition is '**delivering desired social outcomes for their citizens such as improved mobility or improved resident experiences'**,
- The lowest ranked driver (1.6) is **'it's a leadership priority'**
- The most mentioned barriers for those not yet managing connected place technologies are **lack of resources and capacity**, followed by a **lack of funding**
- **40%** of respondents have no timeline to deliver the first feature, **31%** report it will take just between one and three years for their first feature to be delivered
- **40%** have considered and have an understanding of the risks
- **42%** have also considered but do not feel confident in their understanding of the risks
- **45%** of local authorities say they have considered how they will manage the cyber security risks
- **94%** of local authority respondents say they are planning on consulting guidance
- Awareness by maturity group 3 respondents of existing guidance is similar to those in maturity groups 1 and 2: with awareness being **highest for NCSC's Connected Places Cyber Security Principles** and **least for PAS185**

11. Conclusions and Suggested Considerations

The report has described and illustrated trends from a robust set of 173 responses on connected places from local authorities across the UK, plus indicative responses on connected places from 15 non-local authorities. The report has also looked at levels of maturity i.e. at what stage local authorities and non-local authorities are in designing, building and managing connected place technologies.

Based on the experience of survey participants, the report indicates some common approaches to technologies, cyber security, and management of suppliers that may well be useful for others in much earlier stages of the journey.

It should be noted that, given the survey was self-selecting, it is not possible to determine the extent to which any lack of engagement with connected places technologies may have led to more than 200 other UK local authorities choosing not to take part in the survey. Similarly, high levels of engagement with connected places among surveyed non-local authorities should be balanced against the fact only a small number of non-local authority organisations took part. Although the scale of connected places is unknown, this low level of participation does not rule out the possibility that other non-local authorities, within sectors such as transport, utilities, health, are implementing connected place technologies, but simply did not respond to the survey.

There is a large appetite for connected place technologies

In total the survey shows that 92% of respondents (in maturity groups 1 to 3) either do already, or have an ambition, to manage connected place technologies. This points to a large appetite of existing and, in the near future, demand for, connected place technologies across Local authorities and non-local authorities - albeit the latter from a small base.

Just over half already manage connected place technologies

Of the 188 respondents, 53% already manage connected place technologies, either with or without a dedicated strategy in place (maturity groups 1 and 2 respectively). This includes local authorities and non-local authorities spread throughout the UK, with no discernible differences across any one type of organisation (e.g. local authority rural or urban, etc).

Nearly two fifths have an ambition to manage connected place technologies

This comprises 39% of the response base (73 respondents) from maturity group 3 – organisations not yet managing connected places technologies but with a wish or ambition to do so.

Local authority focus on public services

For local authorities in maturity groups 1 and 2, a primary benefit/purpose of connected places is providing a public service around community safety, along with environmental and traffic management. Specific examples include footfall monitoring in town centres, or meeting other important goals, e.g. net zero and mapping electric vehicle charge points.

The biggest driver for most is in delivering desired social outcomes for their citizens such as improved mobility or improved resident experiences (rated at over 4 out of 5 in levels of importance). Very few in maturity groups 1 and 2 point to connected places being a ‘leadership priority’ (rated, in terms of importance, as a lower priority at just over 1 out of 5).

This is the same as for those in maturity group 3 who are motivated by efficiencies, better services to the local population and having, for example, better connectivity.

Process is mainly organic rather than as a result of a specific digital transformation/connected place strategy

Just over a quarter of maturity group 1 and 2 respondents (26.5%) – the top choice - say connected place development is 'organically led' by a delivery department in an organisation as and when the need arises.

Wide variation in planned spend

Whilst very few of maturity groups 1 and 2 are willing to share or able to provide indications of spend over the next 12 months, for those who did respond (20) the midpoint is just over £500,000. The spread of planned spend, however, is very large – between £5,000 to £5 million. It is unclear if this is for replacement or new/additional technologies.

Current most common technologies

Technologies commonly in use are 'sensors and actuators' and 'network connecting devices such as LoRA, NB-IoT, WiFi'. Over half of respondents explain their technologies were implemented more than three years ago. However, in looking at the specific types it is notable that 30.5% of organisations first implemented the most common technology (sensors and actuators) within the t year but for around a fifth of organisations smart cameras are a technology that has been around for more than 5 years.

Connected places is currently in the domain of IT Departments and job roles

Job roles involved in the design, build and management of connected places, indicate it is very much within the domain of IT – usually the Head of IT or possibly a Service Delivery Officer. Other mentioned roles include Head of Regeneration or Head of Innovation. Responding organisations from maturity group 1 (with a connected places strategy) more frequently select 'Connected Place/Smart City strategy/Innovation lead' (15%) than those from maturity group 2 – those without a connected place strategy (4%).

Funding, capacity and skills concerns

Local authorities and non-local authorities in maturity groups 1 and 2 mainly rely on core budgets/internal funding. The biggest barrier to deploying connected place technologies is lack of available funding and resource/capacity. A lack of skills/technical expertise, however, is a bigger worry for non-local authorities (19.5%) than for local authorities (11.3%) for whom this is a lesser concern compared to funding and resource/capacity.

Maturity group 3 respondents also worry about lack of funding and a lack of resource/capacity. They largely anticipate the timeline for first implementation of connected place technologies to be 1 to 3 years, with 20% (14) saying 3 to 5 years.

Confidence in cyber security is high

Findings regarding respondents' maturity relating to cyber security and risk management demonstrate a reasonably confident set of organisations in maturity groups 1 and 2 (over 79% are very or quite confident in their handling of cyber security). They believe they hold good knowledge of what assets are involved in their connected places, and over 70% have a dedicated person responsible for cyber security. Using individual or organisation internal

expertise or experience is often the first port of call to help with controls and measures along with central government guidance. There is a similar proportion of local authorities (70%) having incident response policies to refer to in the event of an incident. It should be noted that these are self-perceptions of levels of knowledge and confidence so it is unknown whether processes match up to these levels. If there is a mismatch it could present a security risk but it is not possible to confirm this via this survey.

Maturity group 3 is almost equally split between those having an understanding of the risks 40% (29) and yes they had considered them to those who had also considered them but did not feel confident about their understanding of cyber security risks 42% (31). An emerging theme among maturity group 3 respondents is the challenge of sourcing finance and skills expertise to build a successful cyber security team.

Reference to internal policies and the use of guidance from the NCSC figure highly in the security of connected places. However, this is once again a self-assessment and this survey cannot verify the appropriate application of this guidance.

Procurement processes are utilised but concerns exist regarding the management of suppliers regarding cyber security

Amongst local authorities, it appears that suppliers are most commonly asked to demonstrate achievement of ISO 27001. This is an information security standard,[8] not a cyber security or connected place standard. It therefore does not have the scope to cover all potential risks that may be present in a connected place. Additionally, 8.5% of responses from local authorities say they have no minimum requirement in place regarding cyber security for their suppliers. Non-local authorities commonly use Cyber Essentials or Cyber Essentials Plus.

There is no dominant way as a route to market and procuring suppliers. Procurement competitions and procurement frameworks (circa 38% respectively) are the most common ways of engaging suppliers for connected places - often via the Crown Commercial Services or G-Cloud. Very few (6%) impose a maximum threshold of £10,000 for procurement frameworks.

Whilst it is unclear how easy or difficult it is to find suppliers, 54 respondents in maturity groups 1 and 2 provided details of their suppliers.

Buyer and supplier clarity of responsibilities and confidence in managing cyber security risks

Clarity surrounding the division of roles and responsibilities between buyers and suppliers regarding cyber security measures is reasonably high. Over 60% of those in maturity groups 1 and 2 have measures such as service level agreements in place. Over 64% say they are quite confident when it comes to identifying and managing cyber security risks.

Relatively high awareness of government guidance and support

Within maturity groups 1 and 2, 88% of respondents report being aware of government guidance on the security of connected places, for example guidance produced by the NCSC or the CPNI. However, this appears to be focused on the NCSC Connected Places Cyber

[8] Around the security of assets such as financial information, intellectual property, employee details or information entrusted by third parties.

Security Principles which 69.7% of maturity groups 1 and 2 have read. There is less awareness of other government guidance with 70% of respondents saying they are not aware of PAS185 (a specification for establishing and implementing a city-wide, strategy level, security minded approach). This lack of awareness is even more prevalent with those first implementing their technologies in the last year. A majority of respondents (61.2%) have not visited the Secure Connected Places Guidance Collection (even higher within the non-local authorities). In maturity group 3, 94% (68) of local authority respondents say they are planning on consulting guidance, as did the one non-local authority respondent, but aside from the NCSC's Principles, awareness was low for the PAS185 and the Secure Connected Place Guidance collection.

Further government guidance/support request

From maturity group 1 and 2 responses, the highest request (14%) is for overarching non-technical guidance for project managers or organisation leadership, followed by (13%) specific use cases in cyber security standards for example environmental monitoring, smart waste and traffic management. This largely coincides with the suggestions of those in maturity group 3 but whose top guidance and support of interest are 'case studies'.

Suggested considerations:

1. Further awareness raising activity focused on the concept and benefits of connected places, as well as the available support, could be value adding across the UK.

2. Organisations that are not yet managing connected place technologies would welcome case studies and further information/insight, e.g. use cases in cyber security standards and cost benefit analysis.

3. In responding to the biggest barriers, maturity groups 1 to 3 need to address issues such as lack of funding, resources/capacity and availability of suitable skills/technical expertise. Support in terms of signposting to key resources and the identification of routes to procuring skills/technical expertise could be helpful.

4. Further overarching non-technical guidance is requested by maturity groups 1 to 3 with the latter (maturity group 3) seeing case studies as the most helpful source of help and guidance. Maturity groups 1 to 3 are interested in 'use case' cyber security standards in, for example, environmental monitoring, smart waste and traffic management.

5. A majority (61%) of respondents in maturity groups 1 and 2 adopt various assurance procedures to ensure suppliers have cyber security measures in place albeit the most common is the ISO27001 which is an information technology standard not one that is dedicated to connected places or cyber security. That, combined with the fact that two fifths are not using or having such assurances in place, and that 54% of maturity group 3 respondents do not appear to have considered cyber security, more therefore needs to be done to help organisations understand how to put such measures in place and why it is essential to the success and growth of their connected place.

Appendices

Appendix 1: Further detail on the Methodology

Prior to the survey launch, DCMS conducted a review stage on an initial draft questionnaire to identify stakeholder opinions on the questions, the length and timings for the survey being live.

Key changes as a result of input and feedback from five local authority representatives were:

- addition of ambitions and aspirations questions for local authorities in recognition that not all may be fully implementing their connected places technology;
- definitions and descriptions of connected places technology, and there should be availability for internal collaboration completions (i.e., more than one person from within a local authority working on a singular response);
- timings – length of questionnaire to be adjusted as well as the length of time the survey should be open.

In conjunction with DCMS, Pye Tait refined the survey questionnaire. The final version comprises eight different sections with multiple routing paths and is provided in Appendix 3.

Outreach:

Various sources were utilised to form the contact lists for the promotion. The extent of contact for each group is outlined below:

Group	How many initial contacts	Follow-up phone contact
Local authority CEOs	397	No
Local authority Director level	656	Yes
Local authority Heads of Service level	1017	Yes
Local authority job roles	23	Yes
1st batch non-local authorities	73	Yes
2nd batch non-local authorities	191	Yes
3rd batch non-local authorities	26	Yes

Local Authority contacts

For the local authorities, two main approaches to compiling contacts were used; a top down (CEO level contact list) and a bottom up (Directors and Heads of relevant departments contact list) approach. This led to the following contact waves:

1. Local authority Chief Executive Officers
2. Specific job roles within Local authorities
3. Local authority Directors of departments relevant to Connected Places
4. Local authority Second Level Heads of Service relevant to Connected Places

The initial stages, prior to the survey going live online, involved acquiring contact details of local authority Chief Executive Officers sourced from Oscar Research Marketing Data. This public sector database covers direct contacts from regional and central government, and is constantly maintained and updated to ensure as close to a full coverage as possible of

current, personal email addresses across all local government bodies. Any gaps in this data were manually filled in via desk research.

As explained in section 2, a three-pronged approach was utilised to reach local authorities and combined authorities. As a result, three contact lists were obtained from the Oscar Research Marketing Database; CEOs and Deputies, local authority Directors of departments related to the functions, Heads of Services of departments related to the functions, and local authority contacts who potentially fall into neither category, but have associated job roles flagged by the keyword search.

This approach, along with the CEO contacts, ensured that every local authority within the UK received information of the survey from DCMS at least once.

Non-local authority contacts

For the non-local authority contacts, Pye Tait compiled these via the made-for-purpose specialised FAME database, which contains information of organisations within the private sector, including contact details. Data was manually filtered to highlight organisations from specific sectors that are likely to be involved in large-scale connected places procurement or smart cities infrastructure projects. These sectors are:

- Transportation – Rail networks, airports, ports etc.
- Property Management
- SMART utilities – Waste, recycling services, water etc.
- Universities
- Health and Social Care
- Sports and Culture – stadiums, museums etc.

These contacts were continuously added to throughout the duration of the survey, and led to three waves of initial outreach.

Reminder emails

Each tranche of contacts was sent at least one reminder email with varying text with the aim to encourage completion and urge the contacts that the survey will only be open for a limited time for them to submit their response.

Reminders were also sent to the non-local authority contacts who had not responded, with the first two waves of contacts receiving two reminder emails, and the third, smaller list, receiving one; the private sector organisations were also contacted and chased via the telephone.

Social media and newsletters

Both Pye Tait and DCMS promoted the survey to their respective Facebook, LinkedIn and Twitter channels throughout the duration of the survey being live.

Additionally, the Secure Connected Places team at DCMS included information about the survey in a number of their industry newsletters, shared the link to the survey with a number of industry groups, and directly reached out to a number of local authorities who had previously engaged with DCMS.

Appendix 2: List of consenting respondents

A total of 144 were happy to have their organisation name listed as a research respondent within the final report. This list of participants is given below. The number in brackets indicates where two different responses (representing different departments) from the same local authority were received:

Organisation names	
1.	Aberdeenshire Council
2.	Addysg Oedolion Cymru
3.	Argyll and Bute Council
4.	Armagh City, Banbridge and Craigavon Borough Council
5.	Ashford Borough Council
6.	Barnsley Metropolitan Borough Council
7.	Bassetlaw District Council
8.	BDP
9.	Birmingham City Council
10.	Blaby District Council
11.	Black Country Consortium Ltd
12.	Blackburn with Darwen Council
13.	Blackpool Council
14.	Blaenau Gwent County Borough Council
15.	Bournemouth, Christchurch and Poole Council
16.	Braintree District Council
17.	Brentwood Borough Council
18.	Broxtowe Borough Council
19.	Buckinghamshire Council
20.	Cambridgeshire County Council, Cambridgeshire and Peterborough CA
21.	Cardiff Council
22.	Carlisle City Council
23.	Cheshire West & Chester Council
24.	Chichester District Council
25.	City of Bradford Metropolitan District Council
26.	City of Wolverhampton Council (2)
27.	Copeland Borough Council

28.	Cornwall Council
29.	Coventry City Council (2)
30.	Crawley Borough Council
31.	Derbyshire Dales District Council
32.	Derry City and Strabane District Council
33.	Doncaster Council
34.	Dumfries & Galloway Council
35.	Dundee City Council
36.	Durham County Council
37.	East Lindsey DC, South Holland DC and Boston Borough Council
38.	East Riding of Yorkshire Council
39.	East Suffolk Council
40.	Essex County Council
41.	Falkirk Council
42.	Fenland District Council
43.	Fife Council
44.	Gateshead Council
45.	Glasgow City Council
46.	Gosport Borough Council
47.	Gravesham Borough Council
48.	Guildford Borough Council
49.	Halton Borough Council
50.	Hampshire County Council
51.	Harrogate Borough Council
52.	HC-One
53.	Hinckley and Bosworth Borough Council
54.	Hull City Council
55.	Isle of Anglesey County Council
56.	Isle of Wight Council
57.	King's College London
58.	Kingston Council
59.	Kirklees Council

60.	Knowsley Metropolitan Borough Council
61.	Lancashire County Council
62.	Lancaster City Council
63.	Leicestershire County Council
64.	Liverpool City Region Combined Authority
65.	London Borough of Barking & Dagenham
66.	London Borough of Brent
67.	London Borough of Hammersmith & Fulham Council
68.	London Borough of Haringey Council
69.	London Borough of Harrow Council
70.	London Borough of Hillingdon Council
71.	London Borough of Richmond and Wandsworth Council
72.	London Borough of Waltham Forest
73.	Manchester City Council
74.	Mansfield District Council
75.	Medway Council
76.	Melton Borough Council
77.	Merthyr Tydfil County Borough Council
78.	Merton Council
79.	Mid and East Antrim Borough Council
80.	Milton Keynes Council
81.	Neath Port Talbot Council
82.	Newark and Sherwood District Council
83.	Newcastle City Council
84.	Newport City Council
85.	North Ayrshire Council
86.	North East Lincolnshire Council
87.	North Kesteven District Council
88.	North Lanarkshire Council
89.	North Lincolnshire Council
90.	North Norfolk District Council
91.	North Somerset Council

92.	North Warwickshire Borough Council
93.	North Yorkshire County Council
94.	Nottingham City Council
95.	Nottinghamshire County Council
96.	Nuneaton and Bedworth Borough Council
97.	Oldham Metropolitan Borough Council
98.	Perth & Kinross Council
99.	Plymouth City Council (2)
100.	Port of Tyne
101.	Reading Borough Council
102.	Renfrewshire Council
103.	Royal Borough of Windsor and Maidenhead Council
104.	Rutland County Council
105.	Scottish Borders Council
106.	Sedgemoor District Council
107.	Selby District Council
108.	Sheffield City Council
109.	Shropshire Council
110.	Slough Borough Council
111.	South Lanarkshire Council
112.	South Staffordshire District Council
113.	South Tyneside Council
114.	South Tyneside Metropolitan Borough Council
115.	Southampton City Council
116.	Southend City Council
117.	St Helens Council
118.	Stafford Borough & Cannock Chase District Councils
119.	Staffordshire County Council
120.	Stirling Council
121.	Stroud District Council
122.	Sunderland City Council
123.	Surrey County Council

124.	Swansea Council
125.	Telford and Wrekin Council
126.	Thurrock Council
127.	University of Birmingham
128.	Wakefield Council
129.	Walsall Council
130.	Warrington Borough Council
131.	Warwickshire County Council (2)
132.	Welwyn Hatfield Borough Council
133.	West Berkshire Council
134.	West Dunbartonshire Council
135.	West Lindsey District Council
136.	West Suffolk Council
137.	Wigan & Bolton Council
138.	Wiltshire Council
139.	Wirral Council
140.	Worcestershire County Council

Appendix 3: Information on in-scope and out of scope information on technologies

A connected place can be described as 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.

A connected place uses a system of sensors, networks, and applications to collect data to improve its operation, including transport, buildings, utilities, environment, infrastructure, and public services.

Examples of 'use cases' that **fall in scope** of connected places include: traffic light management, public realm CCTV, waste management, transport services and other public services such as health and social care.

Examples of technologies that **fall in scope** of connected places include: IoT sensors that collect data such as footfall or air quality; AI enabled surveillance cameras used for traffic monitoring or antisocial behaviour mapping; electric vehicle charging stations; IoT devices used to monitor the health and safety of vulnerable or ageing residents; IoT devices used to improve services such as energy efficient street lighting or smart waste solutions; and data aggregation platforms used to inform decision making.

Examples of technologies that **fall out of scope** include: devices and technology targeted at consumer use such as smart televisions or smartphones; devices and technology targeted at enterprise such as smart printers or CCTV in an office or shop; and devices or technology used in local government buildings.