



City of Westminster

Finance, Planning and Economic Development Policy and Scrutiny Committee

Date:	27 October 2022
Portfolio:	Planning and Economic Development
Title:	Smart City Programme Overview
The Report of:	Aruj Haider, Chief Digital and Innovation Officer
Report Author and Contact Details:	David Wilkins, Head of Smart City Delivery dwilkins@westminster.gov.uk

1.0 Overview

For Westminster, a Smart City is a city that works for its residents, its businesses, and its visitors. As a council, it is our role to shape the transition to a Smart City to make life better for our communities.

The Smart City programme emerged from a recognition that the challenges and opportunities facing our residents, businesses, visitors, and workers in Westminster could be more effectively addressed using innovation, technology, and partnerships. The ambition of the programme is to take an inclusive, participatory, and problem-led approach to delivering quality services and world-leading experiences for our communities.

Becoming a Smart City is a journey, not technology-led but collaborative seeking to find new and imaginative ways of making Westminster a better place to live, work and visit. For the Council, a Smart City will enable the delivery of a *Fairer Westminster*. We will proactively pilot innovative solutions to drive value and efficiency whilst simultaneously delivering the foundations required to prepare Westminster for the future and empower our communities. A timeline of key milestones for the programme can be seen in Appendix 1.

Our Smart City programme is defined by the foundation, pillars, and principles set out in the Smart City framework (see Figure 1).

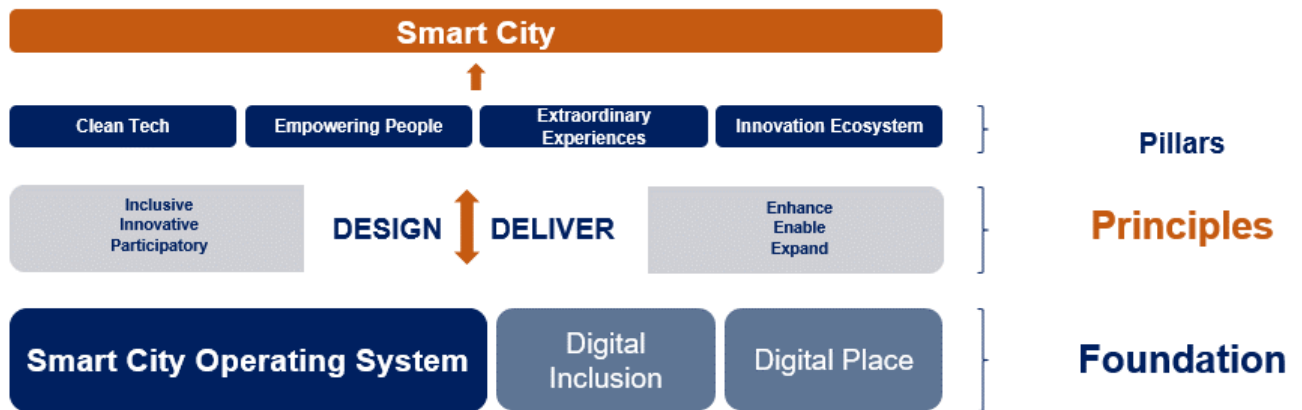


Figure 1 - Smart City Framework

The definition of Smart City is different depending on the context of each city. Below are some examples of what Smart City means to other cities across the globe.

- Barcelona:** Support entrepreneurship and promote inclusion in the digital economy. Support the use of digital technology to address social challenges and promote circular economy models. Invest in research and development, as well as empowering sharing economy alternatives such as platform cooperatives and the maker movement.
- Singapore:** A Singapore where people are more empowered to live meaningful and fulfilled lives, enabled seamlessly by technology, offering exciting opportunities for all. Lead the development of a Smart Nation by working with the public, private and people sectors.
- Amsterdam:** Amsterdam Smart City is the innovation platform of the Amsterdam Metropolitan Area. It challenges companies, citizens, the municipality, and knowledge institutions to submit and apply innovative ideas and sustainable solutions to urban challenges.

1.1 Foundation

The foundation within the Smart City framework encompasses our Digital Inclusion and Digital Place programmes as well as our Smart City Operating System. It is this foundation that will enable us to become a Smart City and a *Fairer* Westminster by providing us with the critical data and analytics capacity, as well as the physical assets foundations for all further solutions and innovations, as well as the improving access and skills of our communities to digital.

1.2 Smart City Operating System

To inform the development of the Smart City Operating System we carried out two proof of concepts, these were focused on aggregation of air quality data and footfall prediction.

Air Quality

For our air quality proof of concept, we were interested in understanding the value of aggregating the disparate air quality data sets within Westminster and explore how this data could be shared with residents, businesses, universities, and internal policy makers. The purpose of the proof of concept was to have a prototype to talk with these user groups and validate whether we should proceed to creating an industrialised product. We purposefully kept the proof of concept simple and did not ingest the real time data which would have added cost and complexity and instead used batch upload of comma-separated values (CSV) files to test the value of this product with users.

We received the following feedback with the user groups that gave us the confidence to proceed with selecting air quality as the minimum viable product for the Smart City Operating System:

- | | |
|-------------------------|---|
| Residents: | The residents and neighbourhood forums welcomed the sharing of air quality data within Westminster. Some groups had already started their own monitoring and had intended to create their own data platform. By having a shared dataset on air quality reduced the need for residents to carry out their own monitoring and if they chose to, they could better target the locations for additional monitors. Residents felt that it was important that alongside the sharing of data, the Council share interventions and practical actions that residents can take to reduce the negative effects of bad quality air. |
| Universities: | Our engagement with universities highlighted that by sharing the Council's air quality data it would enhance research projects being carried out within the university. One example was around using this air quality data to optimise cycling routes based on air quality and the breathing rates of cyclists thus reducing the negative effects associated with cycling within the city. |
| Businesses: | By engaging businesses with the data there is the potential for them to use this data to create innovative products. One business has used this data to create a prototype Clean Air Walking Route which optimises routes based on air quality in near real time. This will help reduce people's exposure to bad quality air. |
| Internal Policy Makers: | Within Westminster City Council there are several departments that collect air quality data but there is no place where this is centrally stored. By creating |

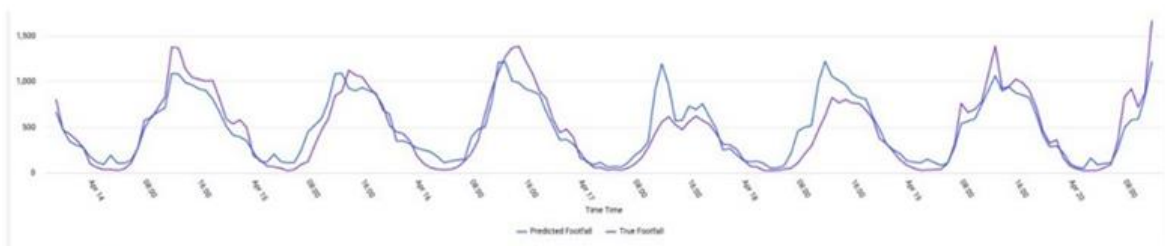
an aggregation of this data, we will have a baseline that will inform decisions on where and if additional air quality monitoring is needed.

This feedback and validation were essential when developing our approach to delivering the Smart City Operating System.

Footfall

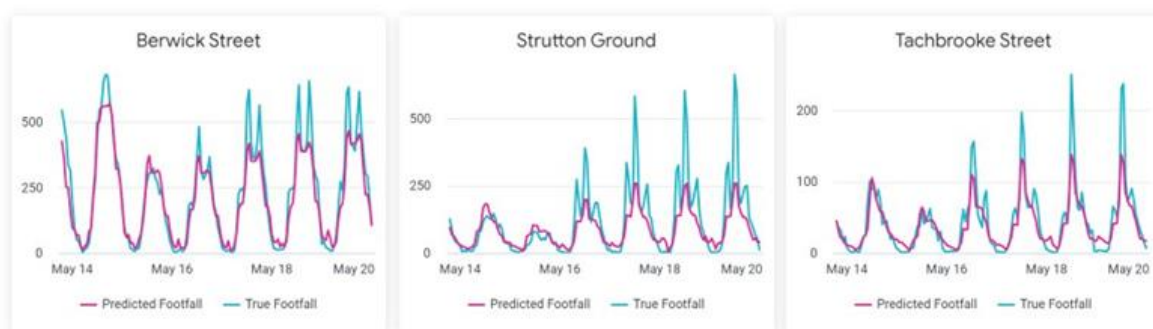
The second example, footfall prediction, used more advanced capability and incorporated machine learning into the project. We wanted to understand if we could predict footfall based on the number of traders on a market, the weather and temporal data around time of day, day of week and seasonality. The data we used for this project was footfall data from our Wi-Fi access points as part of the Digital Street Markets project.

The model we created, as part of the proof of concept, was 73% accurate at predicting footfall (see Figure 2). We felt the model could be improved by having a larger training data set that incorporated footfall data over a longer period so seasonality could be considered. Given the lack of data relating to footfall and due to the likely public health benefits associated with air quality data, we felt that the minimum viable product for the Smart City Operating System should focus on the air quality aggregation use case.



Actual Footfall —
Predicted Footfall —

Predicted Vs Actual Footfall Data (April 2022)



Predicted Footfall —
Actual Footfall —

Figure 2 Footfall Machine Learning

As a result of these two proof of concepts we became much clearer about what the Smart City Operating System is, and we have shared our thoughts below.

Our Smart City Operating System manages the data ecosystem that aggregates, processes and enables data sharing within the Council and with partners to improve economic and social value.

The outcomes we will measure our success against are:

- | | |
|--------------------------------|--|
| Openness and transparency: | These are core values in how we will deliver a <i>Fairer Westminster</i> . The Smart City Operating System will provide a delivery route to share the raw data and insights we hold and provide a platform for others to share data. By sharing our data, we will enable analysis, understanding and innovation. |
| Public Service Improvement: | The Smart City Operating System will provide citizens with data that gives citizens the raw materials they need to engage the Council and contribute to the improvement of public services. |
| Innovation and Economic Value: | Public data, and their re-use, are key resources for social innovation and economic growth. Data provides new opportunities for governments to collaborate with citizens and evaluate public services by giving citizens access to data about those services. Businesses and entrepreneurs are using data to better understand potential markets and build new data-driven products. |
| Effectiveness/Efficiency: | The Smart City Operating System makes it easier and less costly for the Council to discover and access their own data or data from other sources, which reduces acquisition costs, redundancy and overhead. Open Data can also empower citizens with the ability to alert governments to gaps in public datasets and to provide more accurate information. |

The initial focus of the Smart City Operating System will be the aggregation of our and third-party air quality datasets. The datasets will be shared via dashboards but also in their rawest form to enable universities to carry out research, businesses to develop innovative products, policy makers to help make better recommendations

and finally responds to our residents' requests to have a greater understanding of the air quality in their areas.

Our approach to incorporating new datasets to the Smart City Operating System will be user led and value driven. Other datasets on the horizon for inclusion are building emissions, footfall, vehicle counts, and environmental justice measure.

The operating system will manage five different data capabilities. Each capability is at a different maturity level and will require different data components. These are:

Descriptive:	This is about our ability to accurately describe and asset and its location. It is typically static data that is held on geographical information system (GIS) systems and could provide details such as an assets location, and materials.
Informative:	This now incorporates variable data that changes over time. As this data is constantly evolving and changes it requires new capabilities to effectively manage the large data volume. This could include data like our air quality which varies over time.
Predictive:	The predictive element uses this historic data alongside other dataset to bring some forecasting capabilities. This will enable the Council to be more proactive in relation to how it responds to situations. An example of how we are testing this capability is footfall prediction within our street markets and how if we can forecast footfall, how can that influence stock purchasing decisions.
Comprehensive:	This capability explores how you can use the predictive elements to run scenarios prior to major decisions. This will enable the Council the make optimal decisions.
Autonomous:	This level of maturity is not an immediate priority but is something that is on the horizon. All previous maturities the models have been developed by people. This level of maturity embraces artificial intelligence where the system will continually learn and ensure that an optimum outcome is achieved.

In order to develop our maturity, we will run proof of concepts that gradually build our capabilities. Once new capabilities are developed, we will apply these tools to solve other council challenges.

The technology is only one area that we are exploring as part of the Smart City Operating System. Arguably the most important enablers that we need to get right are people, culture, organisational and external factors. For the programme to succeed we need to:

- develop in collaboration with our citizens a set of data principles that govern how we manage citizen data;

- bring in new skills to the Council like data scientists, data architects and data engineers;
- embrace an openness to share data both internally and externally with citizens and partners; and
- develop an understanding of the value of our data across the organisation to ensure it is reliable and accurate.

The key next steps are:

1. Conclude our procurement of a partner to build the minimum viable product. We anticipate the initial build will take 16 weeks and as part of this we will have the capability to ingest data from a variety of different sources, can visualise and share insights online via PowerBI dashboards and make application programming interface (APIs) publicly available to enable other to access this data and use it to create innovative new products.
2. Engage our users to ensure the anticipated value is delivered amongst the four identified stakeholder groups.
3. In parallel to this activity, we will build a pipeline of datasets we wish to add to the Smart City Operating System with a citizen-led approach. We will prioritise data where we anticipate there to be value linked to the outcomes outlined above.
4. Explore new capabilities with a particular focus on how we can link this new capability with our existing architecture with a particular focus on how we can act on the insights generated through this data.

1.3 Digital Place

The focus of our Digital Place programme is to encourage and support the development of a robust digital infrastructure in Westminster that will enable the creation of a truly Smart City by working closely with connectivity providers, as well as our residents and businesses, to make Westminster an attractive place to build fibre connectivity and ensure effective utilisation.

In 2016 when Westminster was languishing near the bottom of the connectivity league tables in the United Kingdom (UK) and since, thanks to our hard work and effective solutions, we have assisted the borough in becoming the London borough with some of the best fibre availability, as well as being the fastest London borough to rollout fibre in 2020.

The goals of our Digital Place programme are:

- Create the right conditions for the market to invest in infrastructure across Westminster;
- Oversee the deployment of full fibre networks across the city and reach 100% full fibre availability (currently at 63.7%);

- Work to accelerate the rollout of 5G and Wi-Fi connectivity across the city to support future Smart City innovations; and
- Raise awareness of connectivity not-spots with operators to accelerate connectivity rollout.

Key delivery to date:

- 97% of Westminster City Council stock connected with fibre;
- 864 businesses connected to fibre;
- 6 street markets with free wi-fi connectivity to support traders;
- 183 businesses at digital skills training sessions;
- 13 market traders at the bespoke market trader sessions; and
- 116 small cells deployed to address 4G mobile not-spots.

The key next steps are:

1. Continue to find barriers associated with fibre deployment and work with industry to address them. We are aware barriers remain in relation to wayleaves, connecting cobbled mews and locations where there is directly buried cables.
2. Deliver the residential voucher scheme addressing not-spots that are not commercially viable.
3. Shift our focus to accelerating the roll out of mobile connectivity. This will include mapping capacity issues faced by the four mobile network operators.
4. Explore how we can leverage existing Wi-Fi networks across Westminster to create a seamless experience for users.

1.4 Digital Inclusion

As we deliver new digital services it is important that we ensure that residents can benefit from the transition to digital. When we started on our journey 8%¹ of residents within Westminster were digitally excluded, as per the City Survey results, and now due to a combination of COVID-19 increasing the importance of being online and the introduction of initiatives to address digital inclusion this figure now sits at 4%².

Our Digital Inclusion programme works across council services, and across sectors with our external partners to tailor support to our residents and businesses according to their needs to drive digital inclusion in Westminster.

The tailored support offered can be in the form of digital access, skills support, as well as confidence building to ensure adopting digital is by choice and to enable residents and businesses to make the most of opportunities through digital skills, connectivity, and access.

¹ Westminster City Council – City Survey 2020

² Westminster City Council – City Survey 2021

The goals of our Digital Inclusion programme are:

- Support digitally excluded residents across three pillars – connectivity, devices, and skills and confidence;
- Increase the community awareness of digital inclusion initiatives;
- Develop a social prescription way of working with resident-facing partners, allowing referrals to be triaged by the Digital Inclusion team and signposted to relevant support;
- Develop community collaboration through focus groups and listening sessions; and
- Develop impact evaluation to ensure support is fit for purpose and having a positive impact on residents and businesses.

Key delivery to date:

- 121 digital ambassador sessions delivered;
- 8 laptops distributed to residents in need from ad/hoc resident donations;
- 23 out of 37 identified community spaces connected to free public Wi-Fi from Community Fibre – this connectivity is available for these spaces indefinitely;
- £23,500 worth of connectivity Cost of Living support made available to help 170 residents. This is funded via private sector contributions; and
- Digital Connectivity Toolkit funded by LGA Digital Connectivity Fund 2020/21 for other local authorities to replicate our success in improving full fibre rollout – over 200 visits to the toolkit.

They key next steps are:

1. Developing community engagement to raise awareness of the Digital Inclusion programme, and to continue developing the social prescription model with partners – creating a holistic support offer for residents to ensure we enable all digitally excluded residents to engage more effectively with the digital world.
2. Continuing to boost connectivity across Westminster through economic development and barrier busting to reach 100% full fibre availability, improving mobile and public realm connectivity, promoting uptake of full fibre and social tariffs, preparing residents and businesses for the digital switchover, and lobbying for further cost of living support to reduce data poverty.
3. Development of a long-term device strategy to ensure we're recycling and donating as many devices as possible internally and from our external business partners too. As well as working with Children's Services colleagues to deliver on the manifesto pledge to provide all Westminster children with suitable devices.

4. Further development of our own skills and confidence support for residents and businesses, as well as mapping of external support available to avoid duplication of effort and efficient social prescription/referrals. This will range from basic support for the most digitally excluded, to advanced support to help close the digital skills employment gap.
5. Further segmentation of the 'Not for Me' and 'Reliant on Others' segments of the digitally excluded population (50%) to ensure we're engaging with the most difficult to reach residents, leaving no one behind. This further segmentation analysis will lead to pilot projects partnered with other London boroughs to understand the most effective behaviour change interventions to engage these residents meaningfully.
6. Continue to utilise and lobby for further social value support around digital inclusion, across connectivity, devices, and skills and confidence to ensure we're creating the best possible value for money service for residents.
7. Working with internal and external partners to ensure the Council, businesses, and residents are prepared for the copper switch off at the end of 2025, and the ongoing digital switchover to full fibre and the challenges this brings, especially around emergency lines, alarms, and other public switched telephone networks (PSTN)/copper-based systems.

1.5 Pillars

To date our activity has been focused on building a strong foundation to enable Smart City use cases. Without this strong foundation of the right digital infrastructure, digital literacy amongst residents and a data platform we would not have the right ingredients to make Smart City projects work. As the foundation has developed significantly since we have started on this journey, we will now increase our focus on how we use this foundation to ensure we deliver against the goals set out in the four pillars within Smart City: Extraordinary Experiences, Innovation Ecosystem, Empowering People and Clean Tech. Further information on each of these pillars is detailed in Appendix 2.

2.0 Approach to Delivery

In order to deliver our Smart City vision, we stand by a series of design and delivery principles that has shaped our overall approach. These principles will ensure our vision remains rooted in the needs and aspirations of our people (problem/user-focused) and that smart solutions and technology is not being delivered for technology's sake. The design and delivery principles are set out in Appendix 3.

3.0 Aims of the Programme

The main aim of the programme is to build a Smart City that enables the delivery of a *Fairer Westminster*.

3.1 Smarter for Residents

We want to offer the best services we can for our residents, using technology to promote wellbeing and independence. We will employ digital channels to reach, enable and empower citizens to drive the change they want to see.

Smart technology can improve how we serve our residents, from the city's social care and education to its arts and culture. Connectivity means opportunity and we plan to support digital inclusion and talent, so everyone has the choice and opportunities that being online affords.

With the right technology, we can make sure every citizen of Westminster can make their voice heard, to shape the city's future.

3.2 Smarter for Businesses

We are home to some of the most creative and competitive businesses in the world. Now we're exploring how smart technology can make our city an even better base for budding entrepreneurs and big corporates.

We already have an Innovation Hub based at City Hall, now we want to bring people together and encourage fresh thinking. We are pulling together funding, direct investment, training, and new partnerships to take your business to the next level.

3.3 Smarter for Visitors

We welcome millions of visitors every year: commuters, shoppers, and tourists from the UK and around the world. Now, we are using smart technology to make every visit extraordinary.

We will be working with the community to make Westminster an even more attractive, exciting, and unique destination, as we trial fresh ideas like interactive street furniture.

3.4 Smarter for Partners

Our ambition is to make Westminster the smartest city in the world – but we are not doing it alone. We are on the search for the right partners for our journey – it is only if we pull together the right partners can we shape the future we want.

We are going to become a leading urban technology test bed so we can take advantage of the latest ideas, then pilot and scale up innovation within the council and across the borough.

We are looking for academic institutions and think tanks, commercial organisations and charities, as well as boroughs across London to work with us.

4.0 Projects Spotlight

There are a variety of projects being delivered as part of the Smart City programme. A selection of projects from across the programme have been provided to place a spotlight on delivery. These have been included in Appendix 4.

5.0 Smart City Budget

The Smart City budget is made up of a combination of external funding, capital programme, income generation and staffing costs (see Table 1).

Table 1 - Overview of Smart City budget

External Funding	£3.36 million
Income Generation	£14.72 million
Capital Programme	£3.67 million
Staffing Costs	£1.2 million

A full breakdown of funding is detailed in Appendix 5.

6.0 Questions for the Committee

- Do the committee agree with our vision of a Smart City and our approach to delivery?
- Are there any areas you would like officer to focus more/less of our attention on?
- Our Smart City is problem led: are there any problems we could explore solving with our Smart City approach?
- The Smart City Operating System will be a way of delivering transparency. Are there are data sets we should prioritise making available?

Appendix 1: Smart City Timeline

The timeline in Figure 3 below sets out key dates and milestones for the Smart City team. This includes the date the team was formed and the dates the Digital Place programme and the Digital Inclusion programme joined the Smart City team. The highlighted milestones in the timeline are a significant indication of the work the team has produced and where benefits can be seen to the other services in the Council.

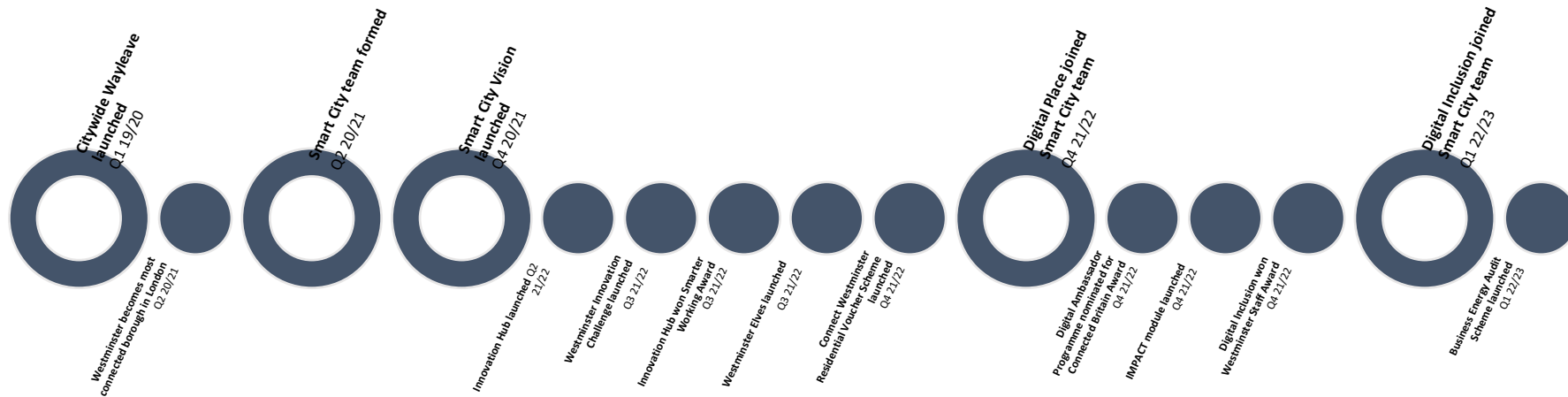


Figure 3 - Smart City Timeline

Appendix 2: Pillars

Pillar	Goals of pillar	Deliverables to date	Going forward	Next Steps
<p>Extraordinary Experience</p> <p>The Extraordinary Experiences pillar seeks to improve the lives of every resident, worker and visitor in Westminster and make their experience extraordinary by getting the basics right, making things easy and working with our communities to celebrate Westminster as an attractive, exciting, and unique destination.</p> <p>The pillar is focused on enabling, showcasing, and attracting – not only to our city through digital innovation in the public realm, but through the Council services offered too.</p> <p>There is a focus on championing our communities and our city’s unique offer, as well as ensuring interactions with our services enable those</p>	<p>Enabling inclusive interactions with residents, businesses and visitors by creating exciting experiences and adding a digital lens to existing products and services;</p> <p>Showcasing Westminster’s diverse communities and extensive and fascinating arts, culture, talent and history;</p> <p>Attracting people to the city through dynamic and enjoyable installations and activations by remaining ahead of the curve;</p> <p>Offer a seamless user experience and efficient interactions when engaging with the Council; and</p>	<p>Westminster Elves – in 2021 over the festive period, an augmented reality experience was offered at four locations across Westminster. This was the Council’s first augmented reality (AR) experience offered. Throughout the five-week period the experience was live there were over 7,000 views of the web-based experience despite there being reduced footfall in the West End.</p>	<p>Learn from the Christmas AR experience and apply learnings on the following future projects:</p> <ul style="list-style-type: none"> ▪ Smart Murals: a project to support the creative industries in the Harrow Road as part of the Creative Enterprise Zone submission. ▪ Explore how digital can help drive footfall to the high streets in a similar way to the BBC’s Green Planet AR experience on Regent Street. <p>Explore proposals from the Westminster Innovation Challenge to pilot, such as:</p>	<p>Develop the Smart Mural concept to support local creatives and our communities to showcase their culture. Beyond a physical installation that lures passers-by to access the digital elements, this may look like a platform that can be displayed across digital advertising boards across Westminster to improve outreach.</p> <p>Implement the Memory Lab project in collaboration with Libraries and Archives that provides a route for residents to preserve precious memories whilst also increasing the diversity of our archives. As this project develops, we will also see how technology can</p>

<p>we serve and are accessed with ease.</p>	<p>Mark Westminster as an incredible, inclusive, and easy destination.</p>		<ul style="list-style-type: none"> • Memory Lab: a project to enable residents to preserve memories into a digital format. 	<p>bring to life these memories for residents.</p> <p>Identify locations across Westminster that could benefit from Wi-Fi provision to support innovations in the public realm, such as the Smart Mural project.</p>
<p>Innovation Ecosystem</p> <p>The Innovation Ecosystem pillar is focused on wanting to see businesses and communities thrive and champion creativity from all sectors.</p> <p>We are looking to partner on our Smart journey: to promote good growth, build resilience using digital, and create new opportunities by adopting innovation that benefits our residents, local businesses, visitors, and our staff.</p>	<p>Forge key partnerships and connections to continuously innovate and foster impactful opportunities;</p> <p>Trial and scale cross-cutting projects that benefit and involve a range of actors;</p> <p>Integrate ‘smart’ ways of working into our organisational culture; and</p> <p>Lead on creating exciting and inclusive spaces and events that foster innovation.</p>	<p>Events/Workshops delivered in the Innovation Hub:</p> <ul style="list-style-type: none"> ▪ Innovation Day by 02 ▪ MyWestminster Digital Card Launch ▪ Mixed Reality in a Day by Microsoft ▪ Westminster Innovation Day ▪ Westminster Team Away Days ▪ Communications team’s daily stand up ▪ Staff Conference ▪ Westminster ABLE Network – Disability Awareness Day ▪ Housing Team – Changing Futures programme 	<p>Learn from the delivery of the Innovation Hub and expand collaborative space in our offices.</p> <p>Working with Wayra, a local start-up accelerator, to find game-changing solutions that positively improve the quality of life for people and businesses.</p> <p>Develop a procurement process for innovation.</p> <p>Working with Innovate UK to identify useful grants and form partnerships.</p>	<p>Identify other potential spaces within the Council that need to be adapted for collaboration and future ways of working.</p> <p>Work with City Lions to gain more footfall to their young person programmes. We will be looking at different wards and depending on the outreach we will be moving our advertisement around the borough.</p> <p>Mobility Map- a Website/App which allows people with disabilities to know what</p>

		<ul style="list-style-type: none"> ▪ Strategy and Intelligence Team – Academic Symposium ▪ Resident Focus Groups ▪ Economy team 0 ‘Kickstart Westminster’ ▪ Youth Ideathon with Google – 6 Youth Groups; Care leavers, Youth Council, Tech Lions, City Lions, Graduates and Apprentices ▪ Women’s Co-production group ▪ Singaporean Delegation of Smart City Workshop <p>Successfully completing Innovation Design and Engineering Masters module with Imperial College London and Royal College of Art.</p>	<p>Develop proposals with Imperial College London and Royal College of Art Masters students as part of their Impact module:</p> <ul style="list-style-type: none"> ▪ Community engagement ▪ Bringing visitors to the West End ▪ Low entry points for new businesses and local entrepreneurs. 	<p>is accessible within their ward.</p> <p>Strawberry Energy – interactive street furniture running on renewable energy to create ‘pause’ spaces in the borough.</p>
<p>Empowering People</p> <p>The Empowering People pillar places people at the heart of everything we do, guided by their opportunities, and needs.</p> <p>There is a focus in this theme on promoting wellbeing and independence to ensure our</p>	<p>Be driven by the opportunities and challenges of our customers;</p> <p>Encourage our businesses, communities, and visitors to take an active role in shaping</p>	<p>Westminster Innovation Challenge (WIC) – in 2021 the WIC was launched to give everyone who works in, lives in, or visits Westminster the chance to suggest their own improvements as to how the city runs. The ideas were reviewed by a panel of experts before deciding the winning</p>	<p>Implement the winning idea from the WIC.</p> <p>Work with other themes on projects that have arisen out of the WIC.</p> <p>Ensure that ideas are shared with other departments and that</p>	<p>Work with residents to identify suitable funding streams to support the delivery of Space Hive projects.</p> <p>Support residents to deliver the ideas developed as part of the Space Hive project.</p>

<p>people-services provide good quality, high value and futuristic care.</p> <p>Digital channels will help to reach, enable, and empower our citizens to drive the change they want to see.</p>	<p>Smart Westminster; and</p> <p>Use technology and innovation to support our residents to live independently and healthily.</p>	<p>idea to progress as a pilot. Over 219 ideas were submitted over the 4-week period. Internally 14 Westminster groups were engaged with as well as weekly drop ins. Externally 8 Westminster Schools were engaged with as well as 13 community groups.</p> <p>Space Hive – this is a community-based funding platform for ideas that bring local places to life. Applicants can create a page for their project idea, and the ones that receive the most community interest and support can be matched to funds. The aim is to provide a powerful springboard for ideas that make communities happy, proud, and prosperous.</p>	<p>actions being taken are shared with those who took part in the WIC.</p> <p>Work with residents to source funding and deliver the citizen led innovations identified via the Space Hive Platform.</p> <p>Test an open-source platform for health sensors in collaboration with Adult Social Care. Set strong criteria for wider adoption of the sensors based on the following criteria:</p> <ul style="list-style-type: none"> ▪ Improved care outcomes and independence. ▪ Reduction in care hours required. 	<p>Rollout the initial health sensors and test to see effectiveness.</p>
<p>Clean Tech</p> <p>The Clean Tech pillar seeks to work in partnership with a variety of internal and external partners, including the third sector, businesses, and communities, to contribute through the use</p>	<p>Facilitate reduction of harmful emissions across the city (such as CO₂ and NO₂);</p> <p>Raise awareness and inform opportunity for</p>	<p>Business Energy Audit scheme – this project commenced in April 2022 and is in delivery phase, delivering up to 1,000 audits of baseline building emissions to small and medium-sized enterprises</p>	<p>Explore the potential of solar windows with colleagues in Housing and examine potential to complement existing solar infrastructure (such as using machine</p>	<p>Conclude the procurement of the supplier to build the Air Quality Data Platform; and then commence the build of the platform. Once built, we will work</p>

<p>of technology and innovation the achievement of the Council's targets of a net zero council by 2030 and a net zero city by 2040 and matching World Health Organisation guidelines to limit exposure to air pollution.</p> <p>The delivery of the Clean Tech strategy is a delivery action within the Council's Climate Action Plan.</p> <p>It is focused on where technology and innovation can reduce emissions, encourage behaviour change and provide actionable insights from quality environmental data to drive impact.</p>	<p>behaviour change – ensure it is easier to for Westminster's residents, businesses, and visitors to make cleaner choices; and</p> <p>Improve ease of access to quality environmental data, to improve knowledge and help to make the best decisions for the environment and communities.</p>	<p>(SMEs), encouraging the uptake of Clean Tech as a means of reducing emissions.</p> <p>Schools air quality pilot project – this project commenced in the summer term 2021 and is in the delivery phase, delivering sensor technology at schools as a means of providing and sharing data on air quality to assist parents, pupils, and teachers to consider their travel habits to and from school and promoting more sustainable travel choices. Over 400 children have been engaged in this project.</p> <p>Air Quality Data Platform prototype and footfall data machine learning challenge proof of concept – these were delivered in early 2022. Community engagement on the air quality data platform prototype has provided positive feedback on the concept, procurement is now underway to build the first phase of the data platform, which is expected to be delivered in Spring 2023.</p>	<p>learning applications to better predict when to export power to the grid in the most cost-effective way with the potential to generate income).</p> <p>Build the air quality data platform the minimum viable product for the Smart City Operating System and work with stakeholders to ensure value is delivered.</p> <p>Provide specialist advice for an audit of the Business Energy Audit scheme to determine any additional barriers businesses are facing in relation to implementing actions identified in their plans.</p> <p>Expand the schools air quality pilot to more schools and adding traffic sensors, and ensure the data is integrated with the</p>	<p>with stakeholders to test the Air Quality Data Platform to ensure it meets users' needs and delivers anticipated value.</p> <p>Build the data capture process for the Sustainable City Charter so we can capture building level data on emissions. Once built, review outcomes of emissions data provided as part of the Sustainable City Charter.</p> <p>Identify schools who wish to participate in next round of the schools' air quality project and expand project to include traffic sensors.</p> <p>Develop and deliver indoor air quality monitoring pilot.</p> <p>Develop pilot of solar windows and machine learning applications associated with solar</p>
--	--	---	--	--

		<p>Climate change and air quality awareness raising events - the innovative 'Carbon Bubble' was showcased during 2021 and the 'Smogmobile' mobile air pollution lab was showcased during 2021 for Clean Air Day and again in 2022 during London Climate Action Week. These events engaged our communities in climate and air quality issues and were reported in the media, including Twitter, Instagram and this year the Smogmobile event was showcased in the London Climate Action Week Showreel.</p>	<p>Smart City Operating System.</p> <p>Create a mechanism to ingest building emissions data provided by signatories of the Sustainable City Charter into the data platform, in a transparent way which can create value.</p> <p>Develop pilot for indoor air quality monitoring in collaboration with services, to raise awareness of indoor air pollution through community engagement and 'citizen science' and develop actionable insights.</p>	<p>panels in collaboration with Council services, such as Housing and Corporate Property.</p> <p>Provide specialist advice into the audit for the Business Energy Audit scheme.</p>
--	--	---	--	---

Appendix 3: Design Principles

- Inclusive:** This approach seeks to capitalise on the diversity of Westminster’s communities, helping to reimagine our smart future. Here, smart means improving access to a quality public service and improved public realm through innovative uses of technology, with both physical and digital platforms and outreach programmes.
- Innovative:** Westminster recognises innovation-for-good as a guiding unifying concept, and specifically the need to both act innovatively, as well as deliver innovative technological solutions. Innovation itself will be built into the culture and practice of the Council, be encouraged from its business community. We must be willing to do no harm but experiment, fail fast, learn, and adapt through proactive pilots.
- Participatory:** The Council cannot, and should not, deliver a Smart City alone. Smart solutions require creativity, collaboration, openness, co-delivery, and new business models. These extend to creative participation of local SMEs, communities, academic institutions, pan-London institutions leading businesses, other boroughs, individuals, and peers. In order to achieve our mission, we rely upon a range of global and local actors across government and industry all operating within the same innovation ecosystem (see Figure 4), with Westminster's ambition driving it at the heart.

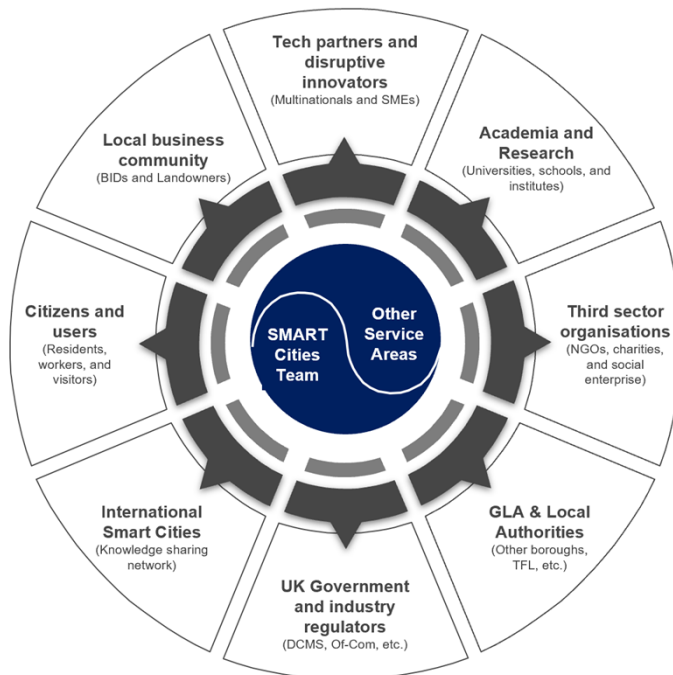


Figure 4 - Our Innovation Ecosystem

Delivery Principles

- Enhance: The Smart City programme will look at the Council's functionalities and services and add features that rely on smart solutions to deliver.
- Enable: The Smart City programme will provide the enabling foundation of data, infrastructure, and partnerships to build on existing and planned projects and initiatives.
- Expand: The Smart City programme can increase the Council's national and international reach to extend impact beyond the city and bring the best of the world to Westminster.

Appendix 4: Spotlight Projects

We have included some sample projects from different themes across the Smart City programme below:

Air Quality Data Platform (Clean Tech and Smart City Operating System)

The data platform – air quality use case project is part of the wider Smart City Operating System. Air quality was selected as an initial use case due to air pollution being a key public health and wellbeing issue.

Currently the Council collects a variety of air quality monitoring data across the borough which is stored in various locations including the London Air, the Department for Environment, Food and Rural Affairs, and Breathe London websites, internal spreadsheets are held on SharePoint and the Earthsense portal. Additionally, other organisations across the borough collect data which in some instances is stored separately, such as the St John's Wood Residents' Association.

The data represents three different monitoring techniques including continuous monitoring stations, sensors, and diffusion tubes. It is noted that there is sole location in which all this data is accessed, thus meaning that should residents, workers or visitors in the city require the air quality data for their area of interest, they are likely to need to search and request this data from many different locations. This runs the risk of incomplete data sets being utilised to make decisions. It is considered that there are opportunities to generate further insights from the air quality data collected, such as strengthening the availability of real time clean air walking routes, but these actionable insights cannot be accurately or comprehensively delivered until the air quality data is aggregated and stored centrally.

The coroner in his report to prevent future deaths following the inquest into the death of Ella Adoo Kissi-Debrah, for which exposure to air pollution was cited as a factor, noted that greater awareness of air pollution would help individuals reduce their exposure to air pollution. Furthermore, the Tackling Local Breaches of Air Quality (National Audit Office report published 17 June 2022), concluded that Government publishes a lot of air quality data, but not in a way that gives the public accessible information about air quality problems and action in their area. There has been little public engagement at a national level about the purpose and progress of the NO₂ programme and the choices government has made to tackle breaches. This creates a lack of transparency which risks undermining value for money because positive public engagement is important for success across the NO₂ programme and government's wider work on air quality.

The Council aims to collate, aggregate, publish and visualise air quality data sets from across the city into one user friendly, publicly accessible place. An application programming interface (API) will be made available for third parties such as universities, citizens, and businesses to freely access the data and create their own value from it. The progress to date has comprised the development of a prototype on

which we sought user feedback from our communities, including residents and businesses. Using this feedback, we have refined our requirements for a platform and are currently procuring a development team to build the minimum viable product. At the time of writing, we have received three quotations, from which we have identified a preferred supplier.

The expected outcomes of this project are:

- Improved transparency and ease of access to air quality data, improving public knowledge about air pollution impacts, thus informing decision making around actions to improve air quality and/or reduce exposure to poor air quality;
- Improved targeting of air quality monitoring across the city, to ensure no duplication and/or 'non' spots of air quality monitoring; and
- Ability for third parties to innovate and create their own value from an aggregated data set using a freely accessible API.

Open-Source Platform for Health Sensors (Empowering People/Smart City Operating System)

Alongside the Adult Social Care service, we are looking at open-source platforms for health sensors to support care packages so that clients can remain in the comfort of their homes for longer giving peace of mind to their families.

Health sensors allow organisations to provide a digital service in support of an existing plan to ensure the customer is in the best health possible. The sensors will alert to abnormal behaviour to the care giver that could be an indication of a decline in overall health of the person. Rather than focusing on approaches to deliver care that intervene during a crisis, care and support services could intervene early to support individuals, helping people retain or regain their skills and confidence, and preventing needs from developing.

Face-to-face care can be delivered when needed, not on a fixed schedule. As a result, carers will be better informed, enabling better health, safety and well-being decisions, an affordable alternative to face-to-face care.

The expected outcomes of this project are:

- Smart City would look at having 20-30 users initially and then scaling up to work on building programmes for pilots that touch on similar areas;
- Health sensors can give information about risk behaviours and whether an accident is likely to happen;
- Adult Social Care colleagues currently have solutions for all the many issues that arise in care areas, but they are siloed and disjointed. We are looking for a platform that has the potential to be the central organising board for the multiple siloed solutions; and
- Reduce the need for costly 24-hour monitoring to evaluate patient health and less intrusive for the client.

Single-Sign On Wi-Fi (Extraordinary Experience/Digital Inclusion/Digital Place)

The Single-Sign On Wi-Fi project is underway to provide our communities with a seamless, secure and free Wi-Fi network in public spaces in support of digital inclusion commitment. This network will be mapped so users can identify access points across the city.

The technical aspects are being scoped but the vision is to offer a seamless service across the city that does not require users to repeatedly sign into the network as they roam. It will be a secure network so residents that may not have mobile data coverage can connect online without risk of data compromise.

The expected outcomes of this project are:

- A reliable, secure and free Wi-Fi service for residents (along with a map of coverage);
- Identify not-spots in terms of Wi-Fi coverage to address;
- Support residents and businesses to thrive through improved access to a secure network; and
- Seamless Wi-Fi coverage in the public realm to support innovations.

Digital Street Markets (Digital Inclusion/Digital Place)

As a part of the 2018 market consultation there was significant interest from market traders for access to their own Wi-Fi network. Following this we applied for and secured £1.2 million to deliver our digital street markets project and deploy networks across each of the Councils markets. Wi-Fi has now been running at our six street markets since December 2021.

The Wi-Fi will enable the following benefits for traders:

- Enable use of card payment machines;
- Allow for more effective use of social media during trading time;
- Online promotion of daily deals and menus so visitors can see what is available; and
- Easy access to the Council's online services, such as Report It.

Alongside the deployment of the Wi-Fi we have procured Rebel Business School to run a two-year programme of digital skills training. We have two different training programmes being run.

The first is a series of two-week courses focused on business and digital skills that everyone should have. Over the last year we have run four of these two weeks courses.

The second programme is support tailored for our market traders which started delivery at the start of October 2022. Two-hour sessions are being run every Monday evening with the content including:

- How to setup card payment machines and take contactless payments;
- Building a website for free;
- Making the best use of social media to find customers;
- Search engine optimisation and getting yourself noticed; and
- How to retain customers.

These training sessions for market traders will continue to run through to the end of March 2023.

Digital Inclusion Persona Research (Digital Inclusion)

In 2021, Westminster City Council undertook a needs assessment to understand the extent of digital exclusion in the borough. The Council built a digital inclusion map using national and local data sets. The map provided an understanding of which groups of residents most vulnerable to digital exclusion and where they are in the borough. To further understand how people are affected and how they can be supported in their journey towards digital inclusion, the Council then undertook persona research and conducted a series of persona interviews.

Desk research was undertaken comparing national, regional, and local digital exclusion data from which, 20 personas were developed to convey the personas that were most likely to be digitally excluded in Westminster. 20 interviews were then conducted with residents who would fit within those personas to develop them further and ascertain from their lived experience the actual issues they face, and what support is required.

From this work, it was cemented that digital inclusion is multi-faceted and dependent on several factors, such as motivation, trust, and physical barriers. Other findings were:

- Multiple barriers often faced simultaneously;
- Timing matters for people to be receptive to upskilling digitally;
- Understanding the positive role that digital can bring is key to changing behaviour;
- Digital exclusion is often part of social exclusion;
- Accessibility and ease of use is essential from the outset;
- Digital inclusion can create a new sense of community; and
- People need ongoing help.

Using these findings, we have tried to ensure that our Digital Inclusion programme is aware and considerate of all these aspects to deliver the most effective, value for money services to digitally excluded residents. For instance, implementing behaviour change theory into our communications and promotions for interventions, offering as holistic a service as possible to cover multiple resident needs, focussing on digital by choice and peer-to-peer support to develop digitally resilient communities, and ensuring we follow up with users so that they get the right ongoing support.

We will continue to use these findings, and the personas, to help improve the efficiency of the programme, and ensure we're targeting interventions at the right people, at the right time.

Innovation Hub (Innovation Ecosystem)

During the pandemic a pulse survey was sent out to all staff asking them what changes they would like to see to the council buildings in the future. The vast majority of staff wanted more of a range of spaces at City Hall with 'collaboration' being the most popular ask.

In response to the survey, we decided to design a space in Westminster for staff, guests, and the Council's partners to use for workshops, showcases and events to co-create ideas and explore technology, with the aim of creating a culture of innovation and collaboration within the Council. We wanted the hub to be completely different from the rest of City Hall (which was designed for pre-pandemic ways of working and not collaboration).

We chose to build the space on the 17th floor of the building where our Executive Leadership Team are based to make the floor more accessible and welcoming to all members of staff and to encourage frequent interaction between our leaders and the officers (or residents) using the space.

It was important for the hub to be multipurpose, flexible, and futureproof so that staff and guests can take ownership of it when they are hosting their events and move the furniture around to make it suit their needs and for the hub to be easily adaptable to suit the needs of the council. We worked closely with the Council's Staff ABLE Network to make sure staff of all abilities would feel comfortable in the space. This was reflected in our choice of furniture, colour schemes and overall layout.

As this was the first space like this in City Hall, getting thorough feedback has been essential and we wanted to have a fun but effective way to do this. Therefore, we have been working with the company 'Hello Lamp Post', who work with councils across the UK. Hello Lamp Post is an innovative engagement tool that encourages people to reflect on the space they are in and empowers them to take ownership and influence its future development. There are a few posters around the hub titled 'Hello Innovation Hub!' with quick response (QR) codes that staff can scan and enter a text conversation with the Innovation Hub itself. They will be able to ask how to book the Innovation Hub, give feedback on the space and let us know what may still be needed, while also having fun and interesting conversations with some sophisticated technology. All this information is fed back to us on a comprehensive dashboard so we can see what people are asking for in real time and what the overall sentiment is. So far, people have loved the space and its usage grows every day.

Another positive result of the Innovation Hub has been how it is supporting Unity Kitchen, the company that works in our City Hall canteen. Unity Kitchen is a social enterprise set up by the Camden Society, it takes on apprentices with a range of disabilities and supplies training and support to enable them to become qualified

members of the catering workforce. All their profit goes back into the enterprise, creating more apprentices and helping more people. Due to lockdown, they have had to close for long periods of time and their income has been low even when re-opening. We have been actively encouraging people to book breakfast, refreshments, lunch and afternoon tea with Unity Kitchen for their events in the Innovation Hub to help them get back on track.

Appendix 5: Budgets and Funding

The breakdown of the budgets are included below.

External funding

The Smart City team has secured the following external funding to support with the delivery of activities (see Table 2 below).

Table 2 - Secured External Funding

Project Name	External Funding Source	Value
Connect Westminster	European Regional Development Fund (ERDF)/Capital programme	£2.8 million (50% ERDF)
Digital Street Markets	ERDF/Capital programme	£1.2 million (50% ERDF)
Business Energy Audit	Additional Restrictions Grant	£500,000 (100% ARG)
Secure Connected Places	Department for Digital, Culture, Media and Sport	£6,000 (100% DCMS)
Digital Inclusion Mapping	London Office of Technology and Innovation	£22,800
Digital Connectivity Toolkit	LGA	£20,000
Memory Lab	Department of Health and Social Care	£15,000

The team will continue to explore external funding to support the delivery of Smart City projects.

We also have the following funding applications within the pipeline (see Table 3 below).

Table 3 - Active External Funding Applications

Project Name	External Funding Source	Value
Clean Air Walking Route	Department for Environment, Food and Rural Affairs	£72,521
Health Sensors	Innovate UK	£45,000
Media Literacy – Digital Inclusion	Department for Digital, Culture, Media and Sport	TBC
Digitally Engaging Hard to Reach Segments	Local Government Digital Fund	£100,000 (possibly £180,000 if we include an Alpha element)

As well as securing external funding we are also collaborating with our partners' funding applications with the intention being that they pilot their projects within Westminster (see Table 4 below).

Table 4 - Active Partner External Funding Applications

Project Name	Partner	Value
Clean/Safe Walking Routes	Imperial College London	£40,000
Data Springboard	King's College London	TBC

Income Generation

The Smart City team manage the Small Cell Concession contract for the Council. This contract makes lamp columns available for the deployment of Small Cells to address mobile connectivity not-spots in the borough whilst also recovering costs. The Small Cell Concession will generate £15 million over the life of the contract.

Capital programme

To support the Smart City programme and to provide match funding for external funding applications, the team has access to funding from the Capital programme (see Table 5 below).

Table 5 - Smart City programme's Capital Budget

Theme	Total	2022/23	2023/24
Smart City Operating System	£750,000	£200,000	£550,000
Clean Tech	£225,000	£100,000	£125,000
Empowering People	£830,000	£405,000	£425,000
Extraordinary Experience	£190,000	£100,000	£90,000
Innovation Ecosystem	£250,000	£250,000	-
Digital Place	£1,425,456	£625,456	£800,000
Total	£3,670,456	£1,680,456	£1,990,000

* Indications of how these budgets are used are included within Appendix 2.