8th CITY UPDATE

Welcome to the 28th (and final) issue of the **8th City Update**, covering programme activity from September to December 2023.

At programme end the seven participating cities (Aberdeen, Dundee, Edinburgh, Glasgow, Inverness, Perth, and Stirling) had delivered 39 separate projects, each contributing to the wider Smart Cities / Connected Places ambitions of those cities.

Data and digital technology has been at the centre of the 8th City programme with activity such as Open Data & Data Analytics, Intelligent Street Lighting (ISL), Water Management, Mobile Working, Smart Energy, Smart Mobility, Smart Waste, Public Safety, and IoT/Connected Assets.

This newsletter also highlights key areas of programme delivery, with a focus on themes such as: Collaboration & Partnership Working; Information Sharing & Communications; Stakeholder Engagement; and Performance Measurement, including Outputs, Outcomes, and Benefits.

Scotland's 8th City - The Smart City.

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Project delivery across the '**Scotland's 8th City – the Smart City**' ERDF programme was completed, as scheduled, by the 30th June 2023. This was followed by a three month period to enable completion of project closure documentation, such as the reporting and recording of outputs and the production of closure reports and case studies.

Funded as a 'Sustainable Growth' Strategic Intervention (SI) within the 2014-2020 European Regional Development Fund (ERDF) operational programme, the 8th City programme was launched in November 2015 in support of Scottish Government's policy action of 'Ensuring our communities are healthy and sustainable'.

In adopting a 'Smart and Sustainable' approach to delivering projects 8th City programme partners have sought to accelerate and transform the delivery of services and infrastructure to make Scotland's cities more attractive, resilient, and sustainable.

8th City programme activity therefore also sought to support work by each city in delivering Net Zero targets in line with, or ahead of, the national target to reduce greenhouse gas emissions to Net Zero by 2045.

City partners have used data and digital technology as core elements to address city priorities and issues relating to data (including open data and data analytics), energy, lighting, mobility, waste, water, and delivery of essential services.

Operational Programme guidance produced in 2014 by Scottish Government - acting as the Managing Authority (MA) for ERDF and other European Structural Funds, noted that the 8th City programme would focus on "*sustainable urban development, through putting in place the enabling infrastructure and piloting 'smart city' technology and approaches…".*

The 8th City programme was delivered in two phases, with Phase 1 commencing in 2015 and running until March 2022. Phase 2 over-lapped and ran concurrently with the latter part of Phase 1 and continued until 30th June 2023, although financial processes and reporting on delivery will continue into 2024.

There were eventually 39 projects over the two Phases of the 8th City programme. These were delivered across the seven cities via investment of £39.6million, including £500k from the SCA-administered Cities investment Fund, and ERDF support of over £16.2 million.

For Inverness, in the Highlands & Islands (H&I) programme area, ERDF grant Intervention Rate was initially at 50% of project budget during Phase 1. By Phase 2, however, the Intervention Rate was raised with ERDF grant available to cover up to 70% of eligible project costs against an agreed budget; for the remaining cities, located in the Lowlands & Uplands area (LUPS), a lower rate of 40% ERDF grant was applied for Phase 1 and Phase 2.

Project activity and key delivery highlights for each of the seven participating cities are noted over the following pages.

03 | Aberdeen Smart City Projects Overview

Covering an area of 185km² and with 198,590 residents, Aberdeen is Scotland's third most populous city and is known as the Granite City.

Aberdeen City Council co-funded (with ERDF) three projects via the 8th City programme.

8th City Programme - Phase 1

Aberdeen delivered three projects in Phase 1: Open Data; Intelligent Street Lighting; and the Mobility-focused Digital Data Development (DDD) project.

The Aberdeen **Open Data** project delivered an Open Data Platform, via a collaborative procurement with Dundee, Inverness, Perth, and Stirling. For an overview of the 8th City programme's approach taken to open data please see **case study**.

The Aberdeen Open Data project was completed in March 2020 and delivered 1 Innovative Service and 9 Dataset outputs. In line with developments at other Scottish cities, Aberdeen has recently shifted to using an Open Spatial Data Platform to share these datasets.
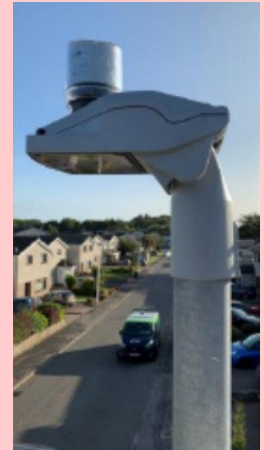
The **Intelligent Street Lighting (ISL)** project has delivered a network of smart LED lights controlled by an innovative hybrid Central Management System which uses LoRaWan open network gateways to control nodes on the lighting columns via a mesh network.

By deploying an ISL network Aberdeen noted anticipated annual savings of around £1M for street lighting costs. See **case study**. The project to instal ISL was completed in September 2019 and delivered 1 Innovative Service and 4 Dataset outputs.

The **Aberdeen Digital Data Development (DDD)** project deployed a network of sensor nodes to enhance Intelligent Transport Systems (ITS) strategies and effectively manage the local transport network - see **case study**. The project delivered 2 Innovative Services and 3 Datasets.

Images: Intelligent Street Lighting (right); Digital Data Development project (below).

"The 8th City Programme accelerated smart city thinking in Aberdeen City Council and through the programme we delivered three innovative projects, Intelligent Street Lighting, Digital Data Deployment and Open Data Platform.

The benefits include efficiencies, reduction in faults, carbon emission savings, and the platform to continue to develop our smart city projects, such as Internet of Things.

Aberdeen City Council is currently looking to deploy further flood sensors as well as water monitoring sensors in schools as part of a project pilot. Digital continues to be central to Aberdeen's Regional Economic Strategy and we are currently delivering three 5G projects through the Aberdeen City Region Deal."

Julie Richards-Wood, Chief Officer - City Growth, Aberdeen City Council

The 'City of Discovery' - covering an area of almost 60km^2 and with 148,210 residents, Dundee is the fourth biggest city in Scotland.

Dundee City Council (DCC) co-funded (with ERDF grant) five projects via the 8th City programme.

8th City Programme - Phase 1

Dundee delivered four projects in Phase 1: Open Data, Public Safety / City Operations; Smart Mobility; and Smart Waste.

The **Open Data** project had a focus on the development of an open data platform, **https://data.dundeecity.gov.uk/**, procured as part of a collaborative approach with Aberdeen, Inverness, Perth, and Stirling. Open Data officers undertook extensive engagement activity in Dundee; as an example of this see the following **case study**.

The Open Data project was completed in December 2019 and produced 1 Innovative Service and 43 Dataset outputs.

The Dundee **Public Safety** project was developed and delivered in partnership with Perth (and with Angus Council, as a non-recipient of 8th City programme funding).

The cities combined resources and learning to work on a Tayside approach to delivering an integrated public safety network. The introduction of enhanced public space CCTV and video analytics capability is playing a key role in integrating the work of partners in tackling crime and disorder and promoting community safety.

The project has delivered a range of open data sets derived from the video analytics systems; these will support Dundee's response to city centre management and inform active travel.

The Public Safety project was completed in February 2022 and produced 1 Innovative Service and 9 Dataset outputs.

Images: Open Data – Dundee Places engagement event (above); Public Safety - CCTV (right); Public Safety – City Operations Centre (below).

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Smart Mobility has been a significant focus of Dundee's activity with the 8th City programme.

For Phase 1, the focus was on **ShareMORE** Mobility as a Service (MaaS) solutions with a range of innovation-led projects delivered via the **Dundee MILL** (Mobility Innovation Living Lab), a real-world test and experimentation environment for innovative mobility solutions. See **case study** for an overview of the ShareMORE projects.

The project was completed in March 2022 and produced 5 Innovative Services outputs.

The Dundee **Smart Waste** project enabled the trial of smart technology and data sharing within the council's Street Scene operational framework by deploying Smart Waste technologies, including: Solar Powered Compactor Bins; Bin Fullness Sensors; Electric Vacuum Industrial Street Sweepers; Hand-Held Devices / Route Optimisation Software.

The Smart Waste project was completed in June 2019 and produced 3 Innovative Services and 6 Dataset outputs.

8th City Programme - Phase 2

Dundee delivered one project in Phase 2. This was a **Smart Mobility** project, initiated with the intention of identifying innovation mobility activity in advance of the implementation, in 2024, of Dundee's Low Emission Zone (LEZ).

This led to a significant extension of electric vehicle (EV) charging infrastructure, including the delivery of what is perhaps Britain's largest fully accessible EV charging site. Launched in April 2023, the Clepington Road EV charging oasis was developed in line with the PAS 1899:2022 guidance. The project delivered four Innovative Services and five Data Sets and was short-listed for the Best Practice in Diversity, Inclusivity and Accessibility category at the National Transport Awards 2023.
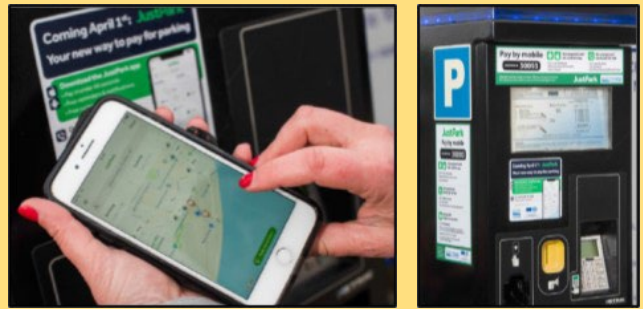
Images: Smart Mobility – Parking App (above); Smart Waste (below).

**Images**: Smart Mobility Phase 2 EV Charge Hub launch event (below).

Covering an area of almost 264km^2 and with 506,520 residents, Edinburgh is Scotland's second most populous city and the 7th largest in the UK. It is known as Auld Reekie - and also described as the Athens of the North.

City of Edinburgh Council (CEC) co-funded, with ERDF grant, four projects via the 8th City programme.

8th City Programme - Phase 1

Edinburgh delivered one project in Phase 1, a **Smart Waste** project which used IoT and smart bin sensors to focus on the collection and servicing of litter bins. This data driven project was seen as a first step towards introducing IoT and Smart Waste technology at scale, with learning made available for a city-wide roll-out of smart bin sensors via the Phase 2 **Driving Operational Efficiency** project (see below). The project was completed in June 2020 and produced 2 Innovative Services and 3 Dataset outputs.
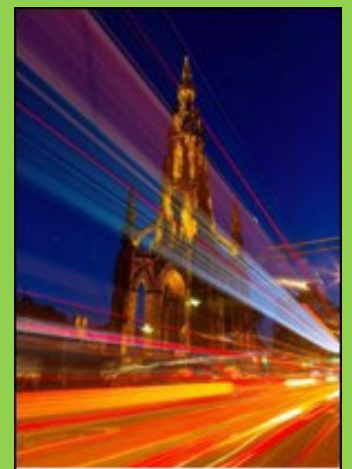
8th City Programme - Phase 2

Edinburgh delivered three projects in Phase 2: City Operations Centre; Intelligent Infrastructure; and the Driving Operational Efficiency (DOE) project.

The **Driving Operational Efficiency (DOE)** project provides a foundational platform and connected sensors, including installation of 11,000 smart bin sensors in all on-street litter bins and over 6,000 communal bins across the city. These sensors provide data on bin usage, predict overflow, and enable proactive collections.

The 1,500 environmental sensors installed in 500 social housing properties enable the monitoring of environmental conditions in homes, reducing the risks of damp.

The DOE project completed in June 2023 and has delivered 4 Innovative Services and 5 Datasets outputs.

Images: Intelligent Infrastructure - roadside sensor (above); Public Safety - CCTV (right); Public Safety – City Operations Centre (below).

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Launched in December 2022 the **City Operations Centre** uses innovative, low-carbon technology to keep Edinburgh's communities safe and to keep traffic and people moving. The Operations Centre uses real-time data to monitor congestion and alleviate traffic pinch points. It also delivers insights into how city planners can reduce carbon emissions, as well as how to manage transport for the city's major events more effectively.

ERDF-funded activity on the City Operations Centre project was completed in June 2023. The project has delivered 5 Innovative Services and 8 Datasets outputs.

Edinburgh's **Intelligent Infrastructure** project has the provision of a new UTMC (Urban Traffic Management & Control) system at its core. The UTMC system allows smart city technology sensors to implement traffic management strategies, communicating with the public through a range of on-line media, and collecting and storing data to inform more efficient transport planning decisions.

Project delivery work on the Intelligent Infrastructure project was completed in June 2023. The project has delivered 3 Innovative Services and 5 Datasets outputs – with more to be delivered as further aspects of the project are fully integrated.

"I've long been a champion of Edinburgh's ambitions of becoming a world-leading Smart City – a digitally inclusive, data-rich, and sustainable Capital with services that are easily accessible by all our residents. So, I'm delighted that we've delivered a foundational platform to drive insights around how the city is operating, which we will build on into the future!

*"From **our trailblazing Operations Centre** which allows us to analyse events and traffic in real time, to the 11,000 smart sensors we've installed in waste bins to make sure our collections are efficient, the first phase of our project towards becoming a Smart City is complete. It has seen us adopt cutting-edge low-carbon technology and it's already helping to keep the city moving and our communities safe, also supporting all schools and young people with digital devices.*

"We've also completed the roll out of 1,500 damp sensors to help us monitor and address issues in our council homes. Phase two of our Smart City project is expected to expand this to all 20,000 of our homes and will also look at sourcing air and water quality sensors, which should help us to monitor our environment. We'll also be looking to technology to help us address environmental issues like fly tipping.

"The whole operation is helping us to improve services and make them more sustainable and fit for the future, drastically stepping up our capabilities as a Council."

Councillor Cammy Day, Leader, City of Edinburgh Council

With a population of 635,130 residents, Glasgow is Scotland's largest city (and the third largest in the UK). Covering am area of 175km^2 Glasgow is known as the Dear Green Place.

Glasgow City Council (GCC) co-funded, with ERDF grant, nine projects via the 8th City programme.

8th City Programme - Phase 1

Glasgow delivered five projects in Phase 1: Open Data; Intelligent Street Lighting; Mobile Working; Smart waste; and a Smart Canal project.

The Glasgow **Open Data/Analytics** project deployed a range of innovative services to enable data to be analysed as part of data-driven innovation and decision-making. A number of case studies have been produced by the project team, covering areas including Data Modelling, Design Led Thinking, and Child Poverty – see **case study**.

The Open Data project was completed in March 2019 and produced 4 Innovative Services and 27 Dataset outputs.

By deploying an extensive city centre **Intelligent Street Lighting** (ISL) network Glasgow is connecting LED lamps with central management systems and network controls to achieve efficiency savings of around 70%; this significantly reduces energy costs and supports an estimated reduction in CO$_2$ emissions of around 700T per year.

The Glasgow ISL (Phase 1) project was completed in June 2019 and produced 1 Innovative Service and 4 Dataset outputs. It is suggested that Intelligent Street Lighting will follow a maturity path similar to that of mobile phones as intelligent lamp post can serve as multi-functional smart-city nodes, capable of monitoring everything from bins to parking to weather.

Images: Open Data project (above); Intelligent Street Lighting (below).

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The Glasgow **Mobile Working** project delivered a range of innovative approaches across core services such as schools transport, bulk uplift, and environmental services. Deployment of app-based mobile working has led to significant benefits for council officers and for the users of those services. In delivering the project, Glasgow hosted a number of 'show and tell' events to share information and learning across the 8th City programme and beyond.

The Mobile Working project was completed in June 2021 and produced 10 Innovative Services outputs.

Images: Mobile Working (above); Smart Waste (below).

Working alongside almost all of the other Scottish cities, Glasgow delivered a **Smart Waste** project as part of a wider ERDF Operation involving Dundee, Edinburgh, Inverness, Perth, and Stirling. Glasgow's approach involved deployment of bin sensors to enable responsive and more efficient collections from street litter bins across pilot neighbourhoods in key areas of the city.

The Smart Waste project was completed in June 2019 and produced 1 Innovative Service and 4 Dataset outputs.

Images: Smart Canal infrastructure (below).

The **Smart Water Management** project - better known as Glasgow's **Smart Canal**, is a pioneering project and the first of its kind in Europe. By deploying sensors and predictive weather technology to dynamically manage water levels along the Forth & Clyde Canal, the project has enabled the canal to become a drainage route for excess surface water during high rainfall events. This, in turn, has opened up for development five major sites covering 110 hectares across North Glasgow. The project also delivers CO_2 savings of 500T per year by reducing the amount of wastewater requiring to be pumped.

The Smart Canal project has received six major awards for innovation, regeneration and infrastructure development, including: Best Innovation/Demand Management Initiative at the Association for Public Service Excellence (APSE) Awards 2021 and the Greatest Contribution to Scotland Award at the Scottish Civil Engineering Awards 2021.

The project has attracted significant interest from other local authorities and international visitors who are rethinking how they can use their reservoirs and canal networks. See **case study** for an overview.

The Smart Canal project was completed in December 2021 and produced 2 Innovative Services and 2 Dataset outputs.

Image: Smart Canal site (above)..

8th City Programme - Phase 2

Glasgow delivered a further four projects in Phase 2: Data Analytics; Intelligent Street Lighting; Mobile Working; and a Smart City Projects Coordinator.

Open Data/Analytics project activity was continued, with the aim of promoting data driven decision making and support the development of public services based on open data, analytics, design and innovative engagement. Further case studies were produced, including COVID-19 Business Grants, and an Alcohol and Drugs Partnership Data Sharing **case study**.

The Glasgow Data project was completed in March 2022 and produced 5 Innovative Services and 30 Dataset outputs.

Further expansion of **Intelligent Street Lighting** was also continued, with the lighting network being extended beyond the city centre. This capability supports Glasgow's ambition to be Net Carbon Zero by 2035. The project completed in June 2023 with outputs 1 Innovative Service and 1 Dataset delivered.
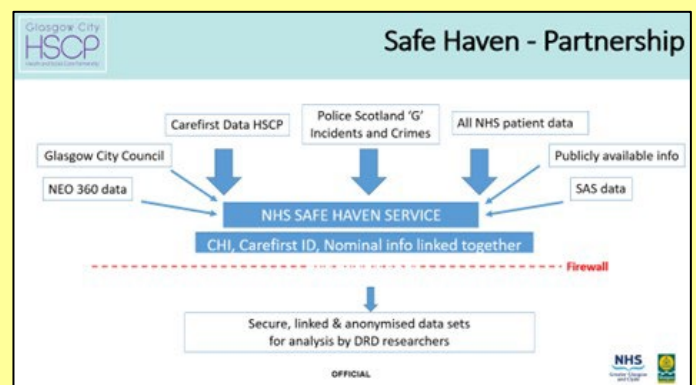
Images: Open Data analytics activity (above); Intelligent Street Lighting (below).

Mobile Working development was also continued into Phase 2 with a major project on Digital Citizen and Asset Management. This project aimed to make Glasgow's public services become better, more accessible, more efficient, and more effective.

The project covers the full range of service delivery - from initial customer and citizen interaction through to the closure of work and service requests and final notification back to the customer. This is being achieved through the development and deployment of mobile platforms and supporting back-office systems, designed to accommodate the required workflows and case management.

The Mobile Working project completed in June 2023 with 5 Innovative Services and 5 Datasets outputs delivered..

Glasgow's fourth project for Phase 2 involved deployment of a **Smart City Projects Co-ordinator** working with officers across the above projects to ensure that a strategic and systematic approach was taken in relation to project delivery, monitoring, and reporting.
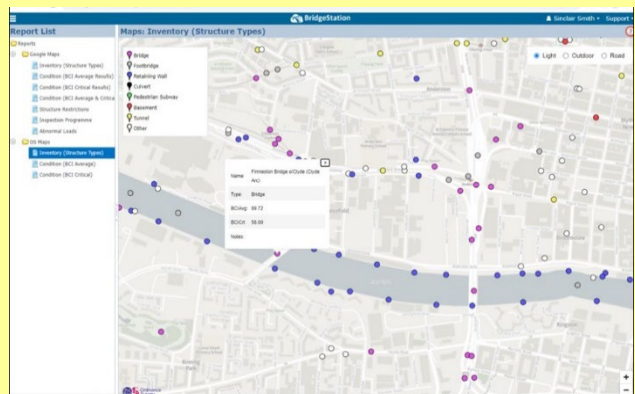
Images: Glasgow Mobile Working (above).

12 | Inverness Smart City Projects Overview

The city of Inverness covers an area of 52km^2 within The Highland Council (THC), a local authority covering an area almost the size of Belgium. With 47,820 residents, Inverness is home to 1 in 5 of The Highland Council's population.

Inverness is one of Europe's fastest growing cities, and was ranked fifth out of almost 200 British cities for its quality of life - the highest of any Scottish city. It was also noted as the happiest place in Scotland and the second happiest in Britain.

The Highland Council co-funded, with ERDF grant, five projects via the 8th City programme.

8th City Programme - Phase 1

Inverness delivered three projects in Phase 1.

Open Data project activity included the development of an open data platform, procured as part of a collaborative approach with Aberdeen, Dundee, Perth, and Stirling. Upon expiration of the open data platform licence in 2020, The Highland Council (THC) made the business decision to port the open data sets to the council's **open spatial data platform** – an approach subsequently adopted by other Scottish cities (see article in issue 27 of the 8th City Update newsletter – available on Scottish Cities Alliance **website**).
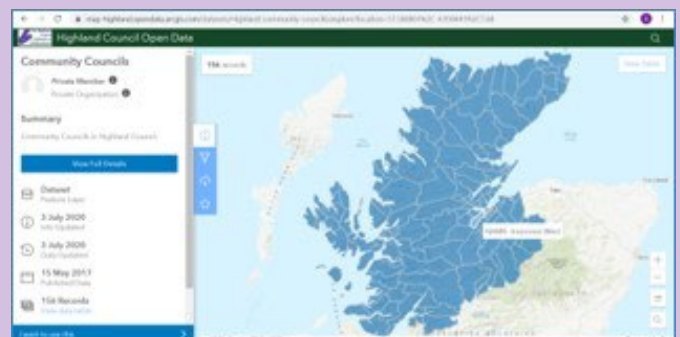
The Open Data project completed in December 2020 and produced 1 Innovative Service and 9 Dataset outputs.

Images: Open Data Platform – Data Set example (above); Smart Mobility Phase 1 – MESH ITS network (below).

The **Smart Mobility** project incorporated a number of sub-projects delivered via a partnership between THC and HITRANS. The central element of the project is a scalable and flexible wireless mesh infrastructure that forms the backbone for future digital city services, including Intelligent Transport Systems (ITS) solutions – see **case study**.

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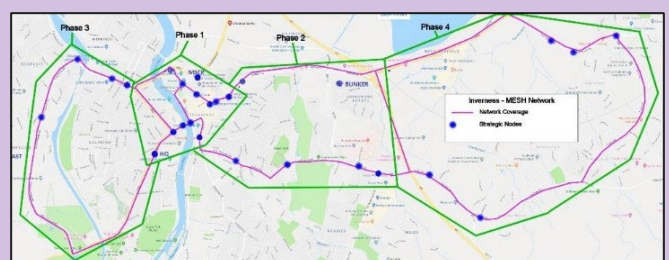
Other elements of the Smart Mobility project include: smart bus stops; smart parking; the Fair Exchange operating system on the Far North rail line; Real Time Passenger Information (RTPI); and enhanced VMS infrastructure.

The Smart Mobility project was completed in December 2021, Outputs across the above noted sub-projects are currently under review but it is anticipated that 4 Innovative Services and 8 Datasets will be delivered.

Images: Smart Mobility Phase 1 – Fair Exchange project and Bus Stop QR Codes (above); example of Smart Waste routes data set (below).

Also delivered in Phase 1, the Inverness **Smart Waste** project had as its primary highlight / innovation the procurement of Route Software, which allows for the development of optimised waste collection routes. See case study for further information. The project completed in March 2021 and delivered 1 Innovative Service and 15 Datasets.

8th City Programme - Phase 2

Inverness delivered a further two projects in Phase 2.

The **Smarter Buildings** project was proposed as one of a portfolio of four smart infrastructure/IoT projects. However, the impact of Covid-19 and the availability of alternative (more relevant / project-specific) funding sources meant that these were subsequently descoped from the 8th City ERDF programme.

Early development activity on the Smarter Buildings project was informed by information sharing and lessons learned from the Stirling Smart Energy project delivered in Phase 1 of the 8th City programme; Stirling Council energy officers were on hand to outline the processes and resources used in the delivery of their project.

Image: Smarter Buildings sensor data (above).

The Smart Buildings activity has enabled the deployment of sensors and monitoring dashboard across a significant proportion of The Highland Council buildings estate. This will more effectively monitor energy usage as part of a buildings management framework.

The Smarter Buildings project completed in June 2023 and delivered 1 Innovative Service and 3 Datasets outputs.

Smart Mobility continued to be an area of project activity and, for Phase 2, extended the focus to Variable Messaging Systems and Real Time Passenger Information (RTPI) linked to travel routes to ferry terminals.

Project delivery completed in June 2023 and is on target to deliver two Innovative Services and up to five Dataset outputs.

Images: Smart Mobility Phase 2 – Infrastructure and example of Data Set information (above).

15 | Perth Smart City Projects Overview

Covering an area of almost 18km^2 and with 47,350 residents, Perth is Scotland's second smallest city in both population and geographical area. Perth is often referred to as the Fair City.

Perth & Kinross Council (PKC) co-funded (with ERDF) eight Smart City projects via the 8th City programme.

8th City Programme - Phase 1

Perth delivered six projects in Phase 1: Open Data; Intelligent Street Lighting (ISL); Mobile Working; Smart Waste; Public Safety / City Operations; and an Innovation Lab within the Perth Creative Exchange.

For the **Open Data** project, the Innovative Service output was the development of an **Open Data Platform**, procured as part of a collaborative approach with Aberdeen, Dundee, Inverness, and Stirling. The platform is for exploring and downloading data relating to the Perth & Kinross area; anyone can use this data at no cost, download raw data, and share.

The **Intelligent Street Lighting** (ISL) project deployed LED lamps with central management systems and network controls to achieve efficiency savings of around 70%; this significantly reduces PKC's energy costs and supports a reduction in CO_2 emissions. ISL also creates opportunities for the deployment of sensors and data collection as integral support for city ambitions to deploy IoT-led Smart City solutions. The ISL project was completed in December 2018 and produced 1 Innovative Service and 4 Dataset outputs.

Perth's **Mobile Working** project led to the development of a number of innovative services arising from the deployment of app-based mobile working. This has led to significant benefits for council officers and for the users of those services. The project was completed in December 2019 and produced 7 Innovative Services and 2 Dataset outputs.
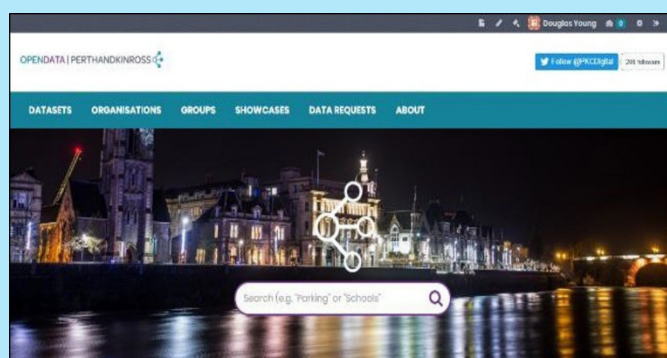
Images: Open Data Platform (above); Intelligent Street Lighting (right); Mobile Working – App Development (below).
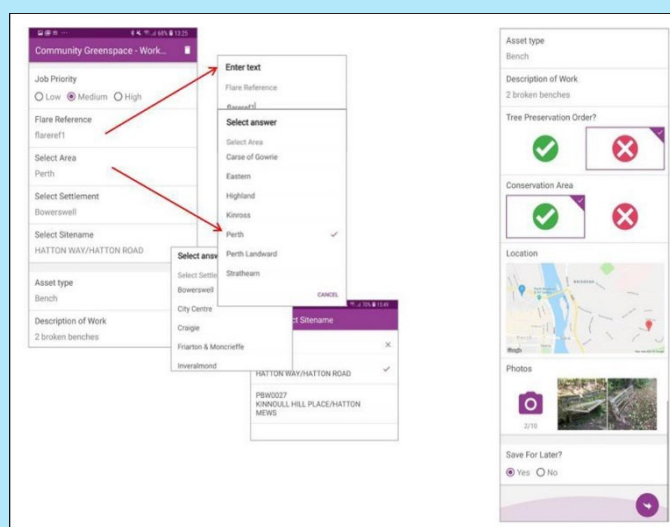
Working alongside Dundee, Edinburgh, Glasgow, Inverness, and Stirling, Waste Officers in Perth deployed a range of **Smart Waste** approaches including bin sensors to enable responsive and more efficient collection. This means less waste going to landfill and fewer journeys made due to data-led routing and scheduling of collection services. Smart Waste Officers in Perth also sought to tackle issues around fly-tipping – see **case study**.

The Smart Waste (Phase 1) project was completed in June 2019 and produced 3 Innovative Services and 3 Dataset outputs.

Images: Smart Waste – Fly-tipping app and staff engagement activity (above); Public Safety – City Operations Centre (below).

The Perth **Public Safety** project was developed and delivered in partnership with Dundee (and with Angus Council also involved as a non-8th City programme partner). The cities working together have combined resources and learning to create a Tayside approach to delivering an integrated public safety network.

The introduction of enhanced public space CCTV and video analytics capability is playing a key role in integrating the work of partners all playing a role in tackling crime and disorder and promoting community safety.

The Perth Public Safety project was completed in December 2021 and produced 1 Innovative Service and 1 Dataset output.

The Perth **Innovation Lab** is nested within the Creative Exchange development led by Perth & Kinross Council and WASPS (Workshops and Artists Studio Provision Scotland).

Launched in February 2020, the Innovation Lab offers space to work on urban challenges and to prototype smart city solutions. The focus is on combining data and digital technology to support the development of new products and services to tackle city challenges.

Image: Innovation Centre at Perth Creative Exchange (above).

The Innovation Lab was subsequently re-branded as The Famous Grouse Ideas Centre. See **case study**. The wider Perth Creative Exchange won the Regeneration Project of the Year at the Scottish Property Awards 2021.

The project delivered 1 Innovative Services and 2 Dataset outputs.
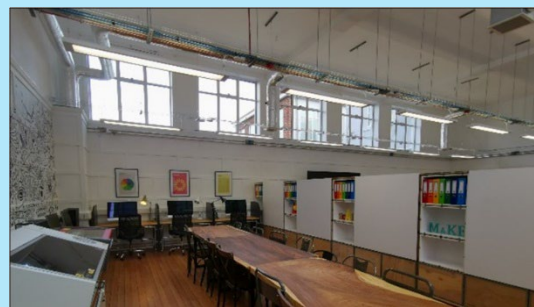
Image: Innovation Centre (above).

8th City Programme - Phase 2: Perth delivered two projects in Phase 2.

Open Data activity continued into Phase 2 of the 8th City programme and Perth has developed extensive data analytics capability; Data literacy has been a strong feature of this work, as evidenced in this **case study**.

The Data project completed in June 2023 and delivered outputs including 4 Innovative Services and 20 Datasets.
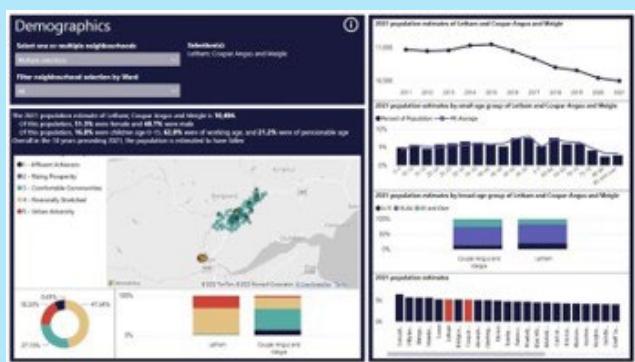
Images: Open Data Phase 2 (above); Smart Waste Phase 2 (below).

Perth also continued with **Smart Waste** project activity from Phase 1 to Phase 2 with ongoing work to integrate new technologies and data to transform the way in which the Council provides waste and street sweeping services.

The Smart Waste project completed in June 2023 and delivered 3 Innovative Services and 3 Datasets outputs.

In summing up Perth's participation in the 'Scotland's 8th City – the Smart City' ERDF programme it was highlighted that:

"The collaborative aspect of the programme was particularly important. I think, when you've got a good 'Smart City' idea, you really want that idea to be taken up by others and that's what is happening now across the Scottish cities: Partners can say, well, we trialled something and it seemed to work, and others are now taking those ideas on and that's great!

A big part of the programme was about mainstreaming; ERDF provided the initial investment and enabled cities to develop ideas and projects to deliver smart and sustainable infrastructure."

**Graham Pinfield, Perth Smart Projects Officer,
Perth & Kinross Council**

Scotland's smallest city in terms of both population (37,910) and area (almost 17km^2), Stirling was granted city status in 2002. Stirling is often referred to as the Gateway to the Highlands.

Stirling Council co-funded, with ERDF grant, five projects via the 8th City programme.

8th City Programme - Phase 1

Stirling delivered four projects in Phase 1: Open Data; Smart Energy; Smart Mobility; and Smart Waste.

For the **Open Data** project, the Innovative Service output was the development of an open data platform, procured as part of a collaborative approach with Aberdeen, Dundee, Inverness, and Perth.

In April 2023 the datasets listed on the open data platform were ported to the Stirling Council ArcGIS **Open Spatial Data platform**.

The Data project completed in March 2019 and delivered 1 Innovative Service and 8 Datasets.

The **Smart Energy** project enabled Stirling Council to deploy energy dashboards to track and monitor energy demand, carbon emissions and renewables performance across 30 key Council sites. See **case study** for overview.

Learning from the development of this project was shared with officers at The Highland Council (THC) during the planning stage for the THC Smarter Buildings project delivered as part of Phase 2 of the 8th City programme.

The Stirling Smart Energy project completed in June 2019 and delivered 1 Innovative Service and 1 Dataset.

Images: Stirling Open Data project (above); Smart Energy Hub and Dataset (below).

Stirling's **Smart Mobility** project deployed sensor-based monitoring of a range of travel modes – including vehicles, cyclists, and pedestrians. This vehicle monitoring infrastructure helps to make travel more efficient . Feeds from these monitoring devices are included as open data sets on the Stirling Open Data platform.

The project completed in December 2018 and delivered 3 Innovative Services and 3 Datasets.
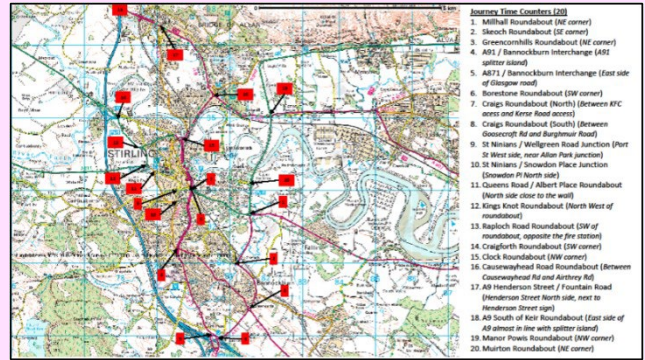
Images: Smart Mobility Data and Infrastructure (above & right); Smart Waste bin (below).

The Stirling **Smart Waste** project included a network of solar-powered compactor bins in the city centre. The project was delivered as part of a wider ERDF Operation involving Dundee, Edinburgh, Glasgow, Inverness, and Perth.

The Smart Waste project completed in December 2018 and delivered 1 Innovative Service and 1 Dataset outputs.

8th City Programme - Phase 2

Stirling delivered one project in Phase 2. The Stirling **Open Data** project activity was continued with a focus on the expansion of datasets available for open access.

The Stirling Open Data project completed in March 2022 and delivered 1 Innovative Service and 30 Dataset outputs.

> *"Smart City activity tends not to be simply an immediate answer to an immediate problem; instead it is about a focus on longer-term awareness and preparedness. The value of data-led delivery is that it can also create a model of learning.*
>
> *Public sector delivery isn't simple; we have to engage communities in order to deliver; sometimes the focus is not simply on what is done but on what could be done to really make a difference."*
>
> **Jim Tonner,**
> **Open Data Officer, Stirling Council**

The Scotland's 8th City – the Smart City collaborative programme was co-developed and delivered by the cities of Aberdeen, Dundee, Edinburgh, Glasgow, Inverness, Perth, and Stirling – working within the framework of the Scottish Cities Alliance.

This partnership approach was present from the very start and included city involvement in the development and submission of the grant application, in March 2015, for the European Regional Development Fund (ERDF) 2014-2020 programme.

In securing an initial ERDF grant of £10M to develop and deliver projects, 8th City partners quickly made a commitment that funded projects would, where possible, be open, scalable, replicable, and inter-operable.

With guidance from Scottish Government, as the Managing Authority for European Structural Funds, it was emphasised that 8th City ERDF grant would for a **collaborative programme**, rather than a challenge fund.

The 8th City programme also sought to improve community engagement, integration of service delivery, promote innovation, and maintain a commitment to joint working and sharing of assets, information, and learning. This comprehensive collaborative approach to Smart and Sustainable Cities is unique, at this scale, across the UK.

Delivery of the programme was aided by the establishment of an **8th City Advisory Group,** based on an existing Smart City Working Group, and was followed by the introduction of the **8th City Strategic Board** and the adoption of **Terms of Reference** outlining governance for delivering the 8th City programme. This was supported by a Programme Management Office (PMO) and with Glasgow City Council as Lead partner.

This development work also highlighted the collaborative nature of the programme and the underlying commitment to partnership working – **one city is all the cities!**

By holding true to a programme delivery approach built on collaboration and partnership working the 8th City programme was latterly recognised and short-listed for the 'Governance and Economy' category of the annual **World Smart City 2021 Awards** - a prestigious competition that seeks to recognize pioneering projects, ideas and strategies making cities around the world more liveable, sustainable, and economically viable. Entries for the awards came from almost 50 countries and winners were announced at the Smart City Expo World Congress in Barcelona - the 8th City ERDF programme was runner-up to the World Economic Forum's G20 Global Smart Cities Alliance.
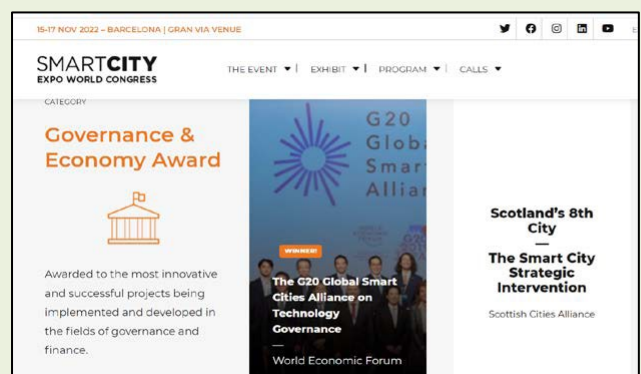
In delivering the 8th City programme from 2015 to 2023, participating cities have evidenced **partnership working** at all aspects of project planning, development, and delivery. In Phase 1, activity was structured around themed Operations and this required cities to share project proposals and to evidence plans for achievement of objectives and outcomes. Collaborative procurement exercises were also explored, with Phase 1 Open Data platforms developed on this basis.

In Phase 1, programme activity was structured around themed ERDF Operations - such as Open Data, Smart Mobility, Smart Waste, etc. All cities were involved in a planning and development event, held at Perth Museum in December 2016. At this event cities were able to highlight key areas of Smart City work and, crucially, to identify any opportunities for partnership working and **collaborations**.

The themed Operations approach required cities to share project proposals and to evidence plans for achievement of shared objectives and outcomes. Project Proposals were peer-reviewed, with at least three other cities receiving proposals for comment and review; proposals were ranked against a range of indicators – with collaboration potential being one of the key areas.

Projects were approved and collaborative procurement exercises were explored in areas such as Intelligent Street Lighting and Smart Waste, with the Phase 1 Open Data Platforms being commissioned and delivered on this basis.

As projects were initiated, developed, and successfully delivered, city representatives and project lead officers provided updates via regular meetings of the 8th City Advisory Group; this process afforded opportunities for information sharing and partnership working - **One city is all the cities!**

Programme Schematic

Smart Infrastructure (Innovation Labs)
Perth ①

Smart Infrastructure (ISL)
Aberdeen ①
Glasgow ① + ②
Perth ①

Smart Infrastructure (Water Management)
Glasgow ①

Intelligent Infrastructure
Edinburgh ② + ②
Inverness ②

Open Data / Analytics
Aberdeen ①
Dundee ①
Glasgow ① + ②
Inverness ①
Perth ① + ②
Stirling ① + ②

Smart Services - Mobility
Aberdeen (DDD) ①
Dundee ① + ②
Inverness ① + ②
Stirling ①

Smart City Co-ordinator
Glasgow ②

Smart Communities / Mobile Working
Glasgow ① + ②
Perth ①

Smart Services - Energy
Stirling ①

Smart Services - Waste
Dundee ①
Edinburgh ①
Glasgow ①
Inverness ①
Perth ① + ②
Stirling ①

Smart Services - Public Safety
Dundee ①
Edinburgh ②
Perth ①

Key
① = Phase 1 (26 projects)
② = Phase 2 (13 projects)

Closely aligned to the 8th City programme ethos of collaboration and partnership working, all project activity has included a significant focus on **communications and information sharing**.

Project and programme delivery (and under-pinning governance arrangements – as outlined in the **8th City Programme Assurance Framework)** includes a requirement that projects are documented and reported via Project Status Reports, Project Closure Reports, and case studies. Along with Stakeholder Engagement strategies and Benefits Realisation plans, these documents provided useful source material for programme partners to share information about project processes, successes, and challenges.

To enable easy access and sharing of these documents, an 8th City network forum was established on the **Knowledge Hub (Khub)** - the UK's largest public service collaboration platform. KHub is the place where people working across public services go to exchange knowledge, experiences and ideas. Via links with the Improvement Service (managers of the KHub Scottish Public Services Network) 8th City partners were supported to join KHub and to undertake training in forum development, content management, and webinar delivery.

In seeking to both develop their respective projects and to share the learning arising from the delivery of those projects, Scottish Cities sought to engage with the **EUROCITIES / Sharing Cities** initiative – with links effected in relation to a number of Smart City domains.

The **Sharing Cities** approach is summarised as 'Building Smart Cities Together' and 'Common Solutions for Shared Challenges' – an ethos and approach entirely consistent with that of the Scotland's 8th City programme.

Images: Managing Authority Lead Partners event (above); Unveiling the commemoration plaque for Edinburgh's 8th City ERDF Smart City projects, 2023 (below).

In addition to information exchange with Sharing Cities and other European-funded initiatives (and also seeking to highlight the value of ERDF and other European Structural Funds) 8th City partners also undertook extensive communications activity with a national focus. With the support of the Scottish Cities Alliance communications officer, social media campaigns (primarily via Twitter) were delivered to show the range of smart city projects and achievements across the cities. As with all 8th City communications activity, this SCA-driven twitter campaign also included a consistent link to the Scottish Government website for European Structural Funds.

Other digital engagement activity took place via inputs to webinars and other information sharing platforms. One example of this was a Smart Waste webinar, delivered as a result of partnership working between the **Digital Office for Scottish Local Government** and **CENSIS**.

The webinar was part of a series exploring how local authorities in Scotland can leverage the seamless integration of data gathered by the Internet of Things (IoT), to manage and optimise their infrastructure. Scottish cities were able to present on Smart Waste projects delivered as part of the 8th City programme.

Colin Birchenall, Chief Technology Officer (CTO) at the Digital Office, noted:

"The Digital Office is working with CENSIS to promote the application of smart technologies in local government. We are delighted to have partnered with the 8th City programme to share the practical experience of smart waste applications learned through the programme with Councils across Scotland. The feedback we have received has been fantastic and we look forward to highlighting the work of the 8th city programme in future events."

Project activity across the 8ᵗʰ City programme, has been informed by the adoption of a shared definition of a 'Smart City' as the **"Integration of data and digital technologies into a strategic approach to sustainability, citizen wellbeing and economic development"**.

These three areas broadly equate to the environmental, social, and economic benefits, highlighted in project proposals submitted by 8ᵗʰ City partners when outlining prospective activity for inclusion in the 8th City programme (see **Collaboration and Partnership Working** article, page 20).

In taking forward work to develop and deliver projects and Operations 8ᵗʰ City programme, partners also agreed to **an additional, non-Operational Programme output in relation to citizen and stakeholder engagement**.

Unlike the core programme output indicators (i.e. 'Innovative Services developed in Cities' and 'Datasets Opened for Innovation') the stakeholder engagement output was not subject to Managing Authority guidance or specification: 8ᵗʰ City programme partners therefore noted measurement of this output as a commitment to incorporate stakeholder engagement for **all projects**, with engagement activity at the Design, Build, and Use stages (i.e. prior, during, and post-project delivery).

To support a credible and consistent process of citizen and stakeholder engagement, 8ᵗʰ City partners jointly developed a **Stakeholder Engagement Strategy** and Action Plan. This was approved in July 2016 and, following discussion with the Managing Authority, was followed by a **Benefits Realisation Strategy** and Action Plan for 8ᵗʰ City programme and projects.

A common thread across the stakeholder engagement output, the Stakeholder Engagement Strategy, and the 8ᵗʰ City Benefits Realisation strategy is the focus on '**Smart Cities for People**' and the need for inclusive and effective stakeholder engagement in the development and delivery of projects.

Supporting guidance, produced as part of the 8ᵗʰ City **Programme Assurance Framework**, highlights links to UN Sustainable Development Goals and Scottish Government's National Standards for Community Engagement, as well as providing links to EU Smart City policy actions – for example the **Inclusive Cities European Manifesto for Citizen Engagement**. The 8ᵗʰ City Stakeholder Engagement Strategy also includes templates for designing, developing, and delivering effective engagement activity.
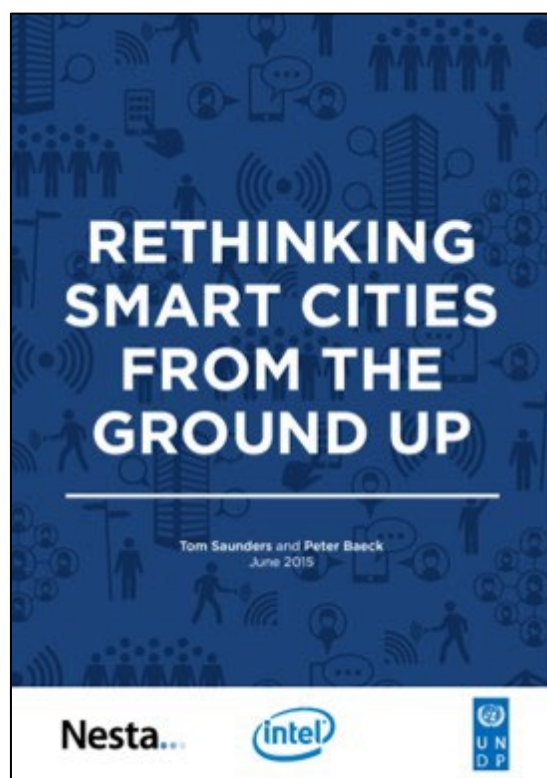
During the early stages of the 8ᵗʰ City programme there was wide support for the '**Smart Cities for People**' agenda: The **Rethinking Smart Cities from the Ground Up** report (Peter Baeck and Tom Saunders, Nesta, 2015) highlighted the general failure of 'top down' smart city ideas, positing instead the opportunities afforded by collaborative technologies which offer cities another way to make smarter use of resources, smarter ways of collecting data and smarter ways to make decisions. Baeck and Saunders also highlighted how collaborative technologies can help citizens shape the future of their cities.

Continues //

A number of the Baeck and Saunders recommendations are threaded through 8th City project activity, with open data and the development of open data platforms being a key feature during phase 1 of the programme. Further examples of citizen and stakeholder engagement being used to inform 8th City open data, and other projects are listed below.

The **Aberdeen** Digital Data Development project is a Smart Mobility monitoring project which included Police Scotland as a major stakeholder, primarily due to the sensitivity of IPCCTV projects. Police Scotland were taken through the whole process to ensure awareness of the foot print the cameras would have. As they required a maintenance contract for IPCCTV they were included in a procurement exercise, which reduced their costs whilst allowing additional maintenance work to be done. Further work subsequently took place around scoping a joint ACC and Police Control room, partly based on improved partnership working.

The **Dundee** open data platform was used to support stakeholder engagement work by Creative Dundee and Dundee Place Partnership regarding cultural opportunities across Dundee and how people engage with these opportunities, if at all. To gain the best insight, they wanted to survey the public but lacked the tools and knowledge to ensure that survey results could be published under an open license to the Dundee City open data platform. DCC supported this by providing Ordnance Survey OpenMaps, enhancing collated results and adding them to OpenStreetMap. Training in ArcGIS Online was provided as well as guidance on publishing data to the Dundee open data platform. Mentoring was provided by DCC throughout the process.

8th City Phase 2 projects in **Edinburgh** have embraced the opportunities afforded by the Internet of Things (IoT) and connected assets. Development and delivery of the Intelligent Infrastructure project has incorporated extensive engagement in support of active travel plans – with Transport for Edinburgh, Cycling Scotland, Transport Scotland, local bus operators, and officers of the City of Edinburgh Council's Active Travel and Low Emissions Zone (LEZ) teams engaged on the project.

Glasgow delivered Mobile Working projects in both Phases of the 8th City programme. The Phase 1 activity was highlighted via 'Show and Tell' events aimed at local and national partners with an interest in delivering Mobile Working initiatives. Glasgow also produced a number of publications highlighting the potential for data and digital technology to support and enhance this area of service delivery.

In developing Smart Infrastructure projects during Phase 2 of the 8th City programme, officers in **Inverness** participated in the **Interreg Smart-Space project** which facilitates the uptake of smart lighting in small/mid-size municipalities to enhance energy efficiency and reduce CO_2 emission. Smart-Space is supported by the Intelligent Lighting Institute (ILI) of the Eindhoven University of Technology and involves the cities of Oostend, Middelburg, and Tipperary.

The Smart Cities Co-ordinator for The Highland Council (THC) was positive about this engagement: "The workshop was great as it really helped our team solidify many of the ideas they had for the project -the act of physically mapping out where potential use cases were most relevant throughout the city was beneficial in helping to provide a structure to the project."

A key aim of the **Perth** Open Data Phase 2 project was to interact with stakeholders by creating chances for engagement and participation. This involved:

- Communicating programme knowledge to the Scottish Data Community (and beyond) and its different stakeholders;
- Involvement in conversation nationally with counterparts in other organisations (including CENSIS, Digital Office, Scottish Government, suppliers and other agencies;
- Attracting counterparts to replicate data initiatives;
- Responding to stakeholders in different contexts using a blend of channels;
- Facilitating a Data & Analytics Steering Group and a wider Advisory group with representatives from each service in Perth and Kinross Council; and
- Engagement with a Digital Board, chaired by Chief Digital Officer, and involving PKC services as part of wider work to steer the Council's digital and data strategy.

Another Open Data project, this time in **Stirling**, has undertaken extensive and ongoing engagement with over 200 interactions recorded across a wide range of partners (from Stirling Council internal to collaborative meetings with external partners). Key areas of activity informed by this engagement include: open data set development and publishing; common data sets; data standards and vocabularies; Data Commons in Scotland (University of Stirling project); and Transition to Net Zero Carbon Scenario Planning Tool (Edinburgh Climate Change Institute, University of Edinburgh).

As part of ongoing stakeholder engagement at programme level, 8th City partners are committed to the wider sharing of information, knowledge, and learning from across all aspects of project activity. The production of project case studies is an integral element of this work, with both long-form technical reports as well as succinct and high level briefings being prepared for projects. The summary case studies offer an ideal introduction to the wide range of Smart City initiatives delivered across the 8th City programme. Many of these are available via the 8th City case studies archive on the **Scottish Cities Alliance** site and, increasingly, on the **BABLE Smart Cities Platform**.