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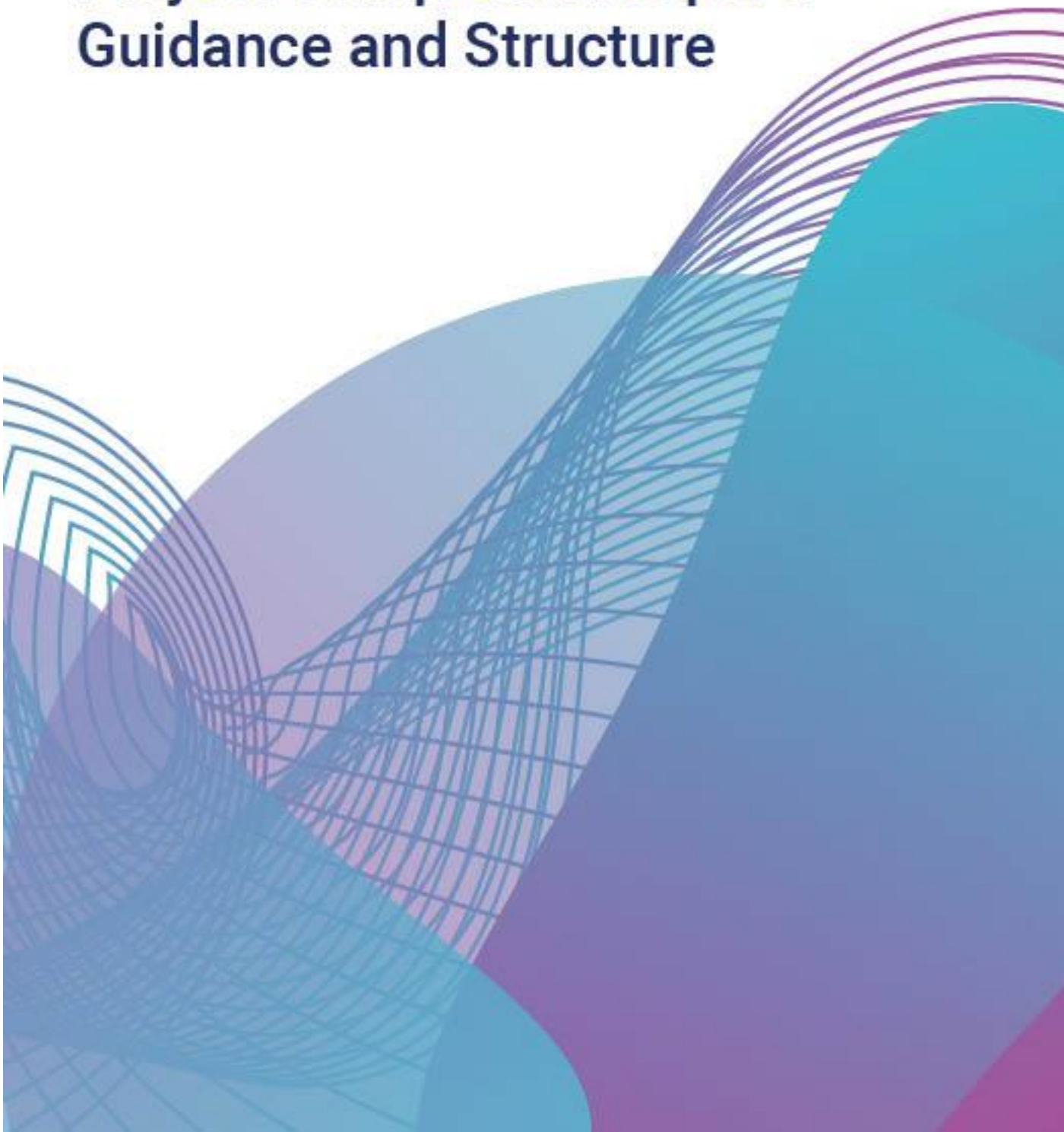
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

Smart Infrastructure Pilots Programme (SIPP) Project Completion Report: Guidance and Structure



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Project Completion Report: Guidance and Structure

The Project Completion Report is your opportunity to document your project's approach and highlight key findings. It should weave together benefits, lessons learned, and outcomes in a clear narrative.

Purpose of the Report

The report provides a high-level overview of the project team's approach, covering design, build, management, and operational aspects. It should be written in plain English, accessible to a general audience.

Be aware that this document, or parts of it, may be published for public consumption. DSIT values insights into both successes and challenges. If any sensitivities arise, please discuss these with your DSIT portfolio manager to ensure knowledge is captured while maintaining appropriate safeguards.

Completion Report Objectives

DSIT views the completion process as both an audit trail and an opportunity to:

- Celebrate achievements.
- Document experiences to guide future projects.
- Inspire innovation and further activity in this field.

When emailing the completed report to your DSIT portfolio manager, please feel free to attach any relevant supporting documents.

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Sections to complete

Project summary

The Smart Infrastructure Pilot Programme (SIPP) was initiated to explore the deployment and impact of PAS 191-compliant smart infrastructure poles, primarily within North Ayrshire Council's (NAC) . Specifically, the Great Harbour Maritime Mile Project in North Ayrshire is a key beneficiary of this initiative, serving as a prime location to showcase the integration of smart infrastructure within a high-visibility, high-impact environment.

As part of the broader Ayrshire Growth Deal, which aims to drive economic regeneration and digital transformation across the region, the Great Harbour Mile was identified as a strategic site to trial advanced connectivity solutions. The waterfront area has long been a focus for development, and this pilot provided the perfect opportunity to establish a connected, smart-enabled experience for residents, businesses, and tourists. The deployment of smart multi-purpose poles within this jurisdiction not only strengthened local digital infrastructure but also supported NAC's vision of a digitally advanced and economically vibrant region.

This pilot aimed to assess the feasibility, cost, and effectiveness of such passive infrastructure to inform future smart city and regional connectivity projects. The initiative was closely aligned with the Ayrshire Growth Deal, the 5G Innovation Regions (5GIR) project and North Ayrshire Council's Digital Strategy, both of which focus on driving digital innovation, economic growth, and sustainability.

The primary objective of this pilot was to test and compare the cost-effectiveness of deploying smart poles for future smart use cases, including IoT applications, enhanced connectivity, environmental monitoring, and public service enhancements.

The second objective was to establish a governance framework that would enable the council to manage future regional technology projects more efficiently. This includes defining a strategic interest group, commercial models, ownership structures, and operational management to maximise economic and social benefits for residents, businesses, and investors in North Ayrshire.

A third objective of the Smart Infrastructure Pilot Programme (SIPP) was to engage the wider ecosystem of project partners and suppliers to provide North Ayrshire Council (NAC) with valuable insights into future digital readiness potential.

At the heart of this project was the Maritime Mile, a strategic initiative to transform the Irvine waterfront into a digitally advanced tourism and economic hub. By integrating smart infrastructure, including public and private Wi-Fi, IoT sensors, and public safety solutions, NAC aimed to set a precedent for smart regional planning and sustainable urban development.

The project aim was to:

- Evaluate the deployment cost of smart multi-purpose poles vs traditional street furniture.
- Understand governance requirements for managing economic digital infrastructure such as this, including operational ownership and funding models.

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- Enhance digital connectivity in key areas, including the Great Harbour, to support tourism, public safety, and business operations.
- Assess the suitability of environmental monitoring use cases, including air quality and movement detection, to support NAC's climate and tourism objectives.

The insights gained from this pilot will directly inform North Ayrshire's long-term digital connectivity and infrastructure strategy, helping the council make data-driven decisions on infrastructure investments, smart place initiatives, and regional economic development.

Project partners

Please specify your project partners names and roles below:

Name	Role in project
Intelligens Consulting Ltd.	Technical advisory, strategic consultancy, procurement and project management support.
North SV Limited	Infrastructure deployment, installation, and maintenance of smart poles. WiFi, wireless backhaul and IoT sensor deployment and environmental monitoring to support data-driven urban planning.
EDF Energy	Smart energy solutions, including metering and energy monitoring for the infrastructure.
Openreach	Duct infrastructure to support backhaul integration for high-speed connectivity.
Freshwave	Development of open-access agreements for a broader 5G rollout across the region.
BT EE	Engagement to assess demand for 5G small cells and potential integration into smart poles.
Vodafone	Direct internet access provider supporting Wi-Fi backhaul and network infrastructure.
CU Phosco	The suppliers of the PAS191 compliant poles to North SV Limited.

Benefits realisation

The evaluation of the Smart Infrastructure Pilot Programme (SIPP) in North Ayrshire follows a formative approach, recognising that the benefits of smart infrastructure deployment will materialise over time, rather than being immediately measurable upon project completion

Given the nature of capital infrastructure projects such as this, the full impact of the deployed PAS 191-compliant smart poles will be realised progressively, as use cases become fully operational and as the Council refines its strategic approach to integrating digital connectivity and infrastructure across the region.

Therefore, rather than a summative evaluation, which assesses completed outcomes, this benefits realisation serves as a formative evaluation, providing early insights into deployment challenges, procurement strategies, and interdepartmental collaboration. These insights are already influencing North Ayrshire Council's approach to smart infrastructure planning and governance, ensuring that future investments are more efficient, scalable, and aligned with strategic objectives.

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Use Cases and Intended Purpose

The project was designed to deliver key digital infrastructure components that would support a variety of public service, economic, and environmental use cases. The table below summarises these use cases:

Use Case	Description
Public Wi-Fi	High-speed connectivity for residents, businesses, and visitors and visitor attractions, improving digital access across key locations.
Enhanced Security CCTV	Smart surveillance cameras to improve public safety and support law enforcement, particularly for tackling anti-social behaviour at Irvine Beach.
IoT-based Environmental Monitoring	Sensors to monitor air quality, footfall, noise pollution, and weather conditions, supporting urban planning and environmental strategies.
EV Charging Integration	Exploring opportunities for future EV charging points on smart poles to support sustainable transportation and low-carbon travel initiatives.
Lighting	Deployment of heritage-style smart lighting to ensure compatibility with existing planning guidelines for conservation areas.
Tourism & Digital Experiences	Enabling digital wayfinding, augmented reality (AR) experiences, and visitor engagement tools, enhancing the tourism experience at key locations.
Wireless Backhaul for Future Expansion	Providing infrastructure to support public Wi-Fi and future wireless technologies, ensuring scalability and long-term network performance.

These use cases are intended to support North Ayrshire's long-term digital transformation strategy, leveraging connected infrastructure to enhance social, economic, and environmental outcomes.

Final Project Outcomes vs Original Application

While the smart pole deployment is expected to be complete by the end of March 2025, the full range of intended benefits will be realised progressively over the coming months and years as use cases are deployed. This aligns with formative evaluation principles, where projects are assessed midway through their lifecycle, allowing for adjustments and future planning based on early findings.

Despite this formative evaluation being slightly premature some outcomes have already been achieved, described below:

- **Deployment of Smart Poles**. Many of the PAS 191-compliant multi-purpose poles have been successfully installed across the Great Harbour Mile, forming a critical digital infrastructure backbone for the region.
- **Strengthened Internal Capabilities**. The project has enhanced North Ayrshire Council's understanding of how to procure, deploy, and manage smart infrastructure, ensuring more streamlined execution in future projects.

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- **Development of Strategic Partnerships**. The council has strengthened relationships with infrastructure providers, digital service suppliers, and neutral host partners, creating a strong ecosystem for future digital investment.
- **Creation of the Smart Infrastructure Group**. A cross-council working group has been established to oversee future smart infrastructure investments, ensuring that digital transformation efforts are coordinated and strategically driven.
- **Knowledge Sharing with Other Authorities**. Insights from the project have already been disseminated to local and regional councils, including East Ayrshire, South Ayrshire, and Ambition North Wales, demonstrating the broader impact of North Ayrshire's leadership in smart infrastructure adoption.

While a full benefits realisation assessment, using summative evaluation principles, should take place in a few years' time, these early achievements demonstrate how the SIPP has already contributed to North Ayrshire's long-term digital transformation goals. Benefits expected to be realised in the coming years, as the use cases become fully operational, include:

- **Public Safety and Security Enhancements**. The CCTV cameras have been procured but are still in the deployment and activation phase, meaning that crime prevention benefits will only be measurable in the near future.
- **Public WiFi Expansion.** While installation is scheduled, full activation and usage assessment will take place following their implementation expected after April 2025.
- **5G Small Cell Deployment**. No immediate demand for small cells was identified, but this remains a viable future use case as connectivity needs evolve. The Council is in touch with Mobile Network Operators (MNOs) and Neutral Host Operators (NHOs) to assess the demand for 5G small cells.
- **IoT Environmental Monitoring**. IoT sensors for footfall tracking and air quality monitoring are scheduled for deployment but have not yet been implemented.

The primary reason these benefits have not yet materialised is the inherently lagged nature of infrastructure-based projects such as this. Given the short project timeline (circa 18 months), it is not possible to complete procurement, civil works, and installation and measure full outcomes within the funding window. However, as infrastructure becomes operational these benefits will start to emerge and will be continuously assessed over the next few years.

Benefits Realisation Approach and Methodology

This benefits realisation process follows a formative evaluation approach, recognising that smart infrastructure projects deliver long-term, accumulative benefits rather than immediate results. As benefits continue to emerge and compound over time, the Smart Infrastructure Group will ensure that North Ayrshire's smart infrastructure remains adaptable and scalable, supporting regional digital ambitions and enhancing public services.

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Procurement

How We Approached It

The procurement for the Smart Infrastructure Pilot Programme (SIPP) was designed to ensure competition, compliance with public procurement regulations, and alignment with North Ayrshire Council's (NAC) digital infrastructure objectives. Given the innovative nature of PAS 191-compliant smart poles and the lack of existing frameworks for their procurement, NAC pursued an open tender process to maximise supplier engagement.

Key procurement milestones included:

- Early supplier engagement was conducted to assess interest and capabilities in delivering smart pole infrastructure.
- The Invitation to Tender (ITT) was published on 22nd May 2024, allowing potential suppliers to bid competitively.
- Suppliers were assessed based on a 50% cost / 50% quality evaluation approach to ensure both affordability and long-term infrastructure resilience.
- Following the evaluation, North SV Limited was awarded the contract on 28th August 2024, with a contract commencement date of 2nd September 2024.

The contract includes an eight-month delivery period (ending 31st March 2025) and a one-year maintenance period (from April 2025 to March 2026) with an option to extend for up to 48 months, subject to funding and performance.

How Long It Took

From early market engagement to contract start, the procurement process took approximately seven months:

- Market engagement and strategy development: February – April 2024
- Tender publication: May 2024
- Bid evaluation and clarifications: May – August 2024
- Award confirmation: August 2024
- Contract start: September 2024

Future Procurement Method for Additional PAS 191 Poles

North Ayrshire Council's procurement approach was unique in that it did not have existing agreements with a neutral host provider to manage and maintain smart pole infrastructure. In addition the Council manages its street lighting in house.

Many other local authorities have neutral host agreements in place, or outsourced agreements with lighting contractors, allowing private sector partners to oversee procurement and maintenance, reducing the direct involvement of the council in infrastructure ownership, procurement and maintenance.

Due to this lack of a neutral host arrangement or private lighting contractors, NAC faced challenges sourcing suitable suppliers, as many smart pole manufacturers do not typically

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contract directly with local authorities are are not on public sector frameworks. This significantly influenced NAC's procurement strategy, requiring direct engagement with the supply chain and an open tender approach.

Moving forward should the Council wish to expand its pole infrastructuire NAC will consider two potential procurement routes:

- Establishing an open-access agreement with a neutral host operator (discussions are ongoing), allowing for a commercially sustainable model where a neutral host takes responsibility for procurement, deployment, and maintenance of poles.
- The existing relationship with North SV Limited remains an option, as they were awarded the initial contract, and the council may continue working with them for further expansion.

Consideration has been given to working with the NAC lighting team to integrate PAS 191-compliant poles into standard street lighting contracts. However, due to the increase in costs and budget this would require it is currently not an option.

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Overview of sustainability

Financial Sustainability - How the use case(s) will continue beyond the capital funding provided by the project

The funding from DSIT covered the capital installation of the smart poles, while the setup of associated use cases such as Wi-Fi, CCTV security, and environmental monitoring was supported by a combination of 5GIR funding and Council funds. This ensured that the infrastructure was deployed with initial functionality to demonstrate its value and impact.

Ongoing support and maintenance costs will be funded by North Ayrshire Council, ensuring the sustainability of the infrastructure beyond the pilot phase. These costs are relatively minimal and will be shared across multiple council departments, including:

- **The Economic Development team** – supporting infrastructure that enhances business connectivity and regional economic growth.
- **The Security team** – funding the continued operation of CCTV and public safety initiatives.
- **The Tourism team** – ensuring smart infrastructure continues to enhance visitor experiences, such as digital wayfinding and public Wi-Fi.

This multi-departmental funding approach has also initiated discussions around the governance of future budgets for smart places, aligning with the strategic direction outlined in the project introduction. The project has not only delivered a sustainable infrastructure model but has also prompted a longer-term financial planning conversation within the council, ensuring that future smart city investments are structured with clear budgetary ownership and accountability.

Scalability - How we envisage increasing scale of use cases deployed (within your region or widening adoption (across other LAs, regions)

The Great Harbour Smart Infrastructure deployment has established a replicable model for smart pole integration in both urban and rural locations. Future investments will focus on enhancing 5G small cell connectivity subject to demand, integrating EV charging, and enabling smart region and smart city applications. The intention is to build upon the foundations created by the DSIT SIPP project, ensuring that digital infrastructure continues to evolve to support future connectivity and smart technology needs.

Wider adoption across other local authorities can be achieved, particularly as North Ayrshire Council is actively sharing insights and lessons learned from the pilot with its regional partners, namely South Ayrshire Council and East Ayrshire Council. These councils are also part of the 5G Innovation Regions (5GIR) programme and beneficiaries of the Ayrshire Growth Deal, making them well-positioned to replicate elements of the smart infrastructure approach developed in North Ayrshire.

This established working group has already discussed and explored opportunities to leverage a similar framework to deploy smart infrastructure such as public Wi-Fi within their regions. This includes leveraging procurement models and sharing technical specifications. By collaborating through this regional approach, the Ayrshire local authorities can ensure a

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consistent and scalable smart infrastructure rollout, maximising efficiency, reducing costs, and driving broader digital transformation across the region.

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Investment stimulation/costs

Cost Breakdown Including Deployment Costs

The Smart Infrastructure Pilot Programme (SIPP) exclusively involved the installation of new PAS 191-compliant poles, with no retrofit of existing poles. All installations were at completely new sites, strategically selected to complement existing street lighting plans or align with future proposed lighting plans. This approach ensured that the infrastructure was fit for purpose, fully compliant with PAS 191 standards, and capable of supporting long-term smart city applications.

Total One-Off / Capital Costs for the installation, supply and connection of six poles was GBP 241,784.25.

Cost Component	Amount (£)	Deployment Type
Surveys	£815.21	General project setup cost
Solution design costs	£792.70	General project setup cost
Permit and planning costs	£9,375.00	Required for all new pole installations
Supply and delivery of PAS 191-compliant poles	£120,579.98	New pole installation
Civil costs for poles and foundation installation	£31,444.74	New pole installation
Civil costs for supply and laying fibre ducts	£27,298.30	New pole installation (connectivity enhancement)
DNO (Distribution Network Operator) connection costs	£46,669.95	Power infrastructure upgrade for new installations

All poles were installed at new locations rather than retrofitting existing assets. Installation sites were chosen to align with existing or future lighting plans, ensuring compatibility with urban infrastructure strategies.

Investment Stimulated from the Project

The Smart Infrastructure Pilot Programme (SIPP) has successfully triggered additional investment in use cases and supporting infrastructure, demonstrating its role as a catalyst for broader digital transformation in North Ayrshire.

Following the completion of the initial infrastructure deployment, further investment has been committed to expanding the range of use cases supported by the smart poles using public funds.

Wi-Fi, Wireless Backhaul, and IoT use cases represent a GBP 103k investment to enhance connectivity, network security, and data capabilities:

- Capital Investment: c. GBP 65k
- Operational Expenditure (Opex) Over 3 Years: c. GBP 38k

Security Enhancements through Additional CCTV Deployment – North Ayrshire Council's Public Safety team has committed to investing further in CCTV cameras to increase security

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coverage at each smart pole location, leveraging the connectivity infrastructure established through SIPP.

Investment discussions are ongoing with Freshwave and other suppliers to explore opportunities for co-funded infrastructure expansion. This includes potential models where neutral host providers take on long-term management and investment responsibilities for future smart infrastructure deployments, reducing reliance on public funding.

These developments are expected to be just the beginning, as the Council continues to evaluate the broader benefits of smart digital infrastructure.

The Smart Infrastructure Group formed as part of this project, is assessing wider opportunities for smart pole adoption and how investment can be scaled across North Ayrshire and beyond. In addition, South Ayrshire and East Ayrshire Councils are working with NAC to explore multi-authority procurement frameworks, which would enable future investment in shared smart infrastructure projects.

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Overview of lessons learnt

Based on the lessons learned from the Smart Infrastructure Pilot Programme (SIPP), several key recommendations emerge to inform future projects, particularly around policy objectives, procurement, technical deployment, and regional collaboration.

1. Strengthen Early Cross-Departmental Collaboration

- Lesson Learned - Engaging the Lighting Team and Planning Team at the outset was critical to ensuring that power and planning requirements were properly assessed.
- Recommendation - Future projects should formalise early engagement across lighting, planning, security, economic development, and digital infrastructure teams to streamline approvals, avoid rework, and ensure infrastructure alignment.

2. Address Procurement Challenges by Enhancing Framework Flexibility

- Lesson Learned - Procurement for smart poles was challenging as many manufacturers are not on public procurement frameworks, leading to complex direct engagements with suppliers.
- Recommendation - Policy objectives should focus on expanding procurement frameworks to include smart pole providers and neutral host infrastructure suppliers. North Ayrshire Council should also work with other local authorities to standardise procurement specifications and enable joint procurements where possible.

3. Improve Strategic Deployment of Smart Infrastructure

- Lesson Learned - Not all poles require small cell technology or fibre backhaul, and some locations were better suited for alternative deployments.
- Recommendation - Future deployments should be site-specific, with a clear justification for 5G integration, small cells, and fibre connectivity based on local demand and infrastructure feasibility. A pre-deployment assessment framework should be developed to optimise investment decisions.

4. Plan for EV Charging and Ducting Infrastructure from the Start

- Lesson Learned - EV charging stations require substantial investment in power infrastructure, and retroactive ducting is costly.
- Recommendation - Future smart infrastructure projects should integrate power and fibre ducting considerations from the outset, ensuring that all necessary conduits are in place to support future expansion without costly retrofits.

5. Leverage Turnkey Solutions for Simplified Deployment

- Lesson Learned - Turnkey solutions significantly reduced deployment challenges, streamlining the integration of smart poles.
- Recommendation - Future procurements should consider bundled “design, build, operate, and maintain” solutions to improve efficiency, reduce project complexity, and increase accountability for long-term maintenance.

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Future plans

Forward Plan for the PAS 191-Compliant Poles

The forward plan for the PAS 191-compliant poles involves a collaborative approach between various council departments that own and manage the use cases deployed on the infrastructure. While the Lighting Team may assume responsibility for the ownership and maintenance of the poles in due course, ongoing strategic oversight will remain with multiple departments, particularly those funding specific use cases such as economic development, security, and tourism.

At present, formal commercial agreements have yet to be finalised; however, in principle, costs associated with the maintenance of the poles will be shared across these key departments. Future funding arrangements will take this shared responsibility into account to ensure the continued operation and sustainability of the infrastructure.

There is no planned end date for the maintenance or operation of the PAS 191 poles. They are intended to remain a permanent feature of North Ayrshire's smart infrastructure, supporting ongoing and future digital initiatives. Should the maintenance contract no longer be deemed necessary, it is hoped that the ownership and upkeep of the poles will be transferred to the Council's Lighting Team as part of standard street infrastructure management.

Capturing Outputs and Learnings from the Project

To ensure that the council can make informed decisions on whether PAS 191-compliant poles should be deployed in the future, a Smart Infrastructure Group is currently being formed. This group comprises Senior Responsible Officers from digital transformation and key council service areas, tasked with assessing the benefits of smart poles and the broader role of digital connectivity infrastructure.

A primary focus of this group is to evaluate how PAS 191 poles, associated use cases, and smart region initiatives contribute to the social and economic impact of the area. The insights gathered from this pilot will help inform a structured decision-making 'digital first' framework, ensuring that the council takes a measured approach in determining whether PAS 191 poles or alternative assets are the most appropriate infrastructure for enhancing digital connectivity in North Ayrshire.

Impact on the Street Lighting and Digital Strategy

The project has influenced an update to the council's street lighting and digital strategy by raising awareness of PAS 191-compliant multi-purpose columns among relevant departments. The Lighting Team and associated service areas now recognise the potential of these poles in supporting smart city initiatives.

However, due to the high costs associated with installing the infrastructure, PAS 191 poles are unlikely to be considered as a default replacement for traditional street lighting. Instead, guided by the Smart Infrastructure Group the council will take a more strategic approach by deploying multi-purpose poles (o other suitable digital infrastructure) only in locations where there is clear demand and a justifiable business case. This ensures that investments are

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made in a way that maximises the benefits of smart infrastructure while aligning with broader digital transformation objectives.

Developing a Decision Tree for PAS 191 Pole Deployment

At present, there is no formal decision tree or business case outlining when PAS 191 poles should be deployed. However, this will be developed as the Smart Infrastructure Group evolves into a cross-council working group. This process will involve assessing how smart connectivity infrastructure can support economic growth, public services, and community engagement while also integrating a digital-first approach across all council service areas.

The decision-making framework will ensure that future deployments are strategically aligned with regional priorities and the council's Digital Connectivity and Infrastructure Plan (DCIP) which is in the early stages of development.

The process will involve evaluating use case requirements, assessing potential funding sources, and balancing costs against long-term benefits.

Strategic Logic for Future Infrastructure Deployment

The Smart Infrastructure Group has been established to facilitate a more strategic and proactive approach to digital infrastructure and connectivity across the region. This approach moves beyond isolated, tactical deployments and instead considers the wider implications of how digital connectivity can support regional social and economic development.

North Ayrshire now has a strategic understanding of key stakeholders, including neutral host providers, mobile network operators (MNOs), and other infrastructure partners, as well as their interest in supporting smart infrastructure. Through insights gained from this project, the council can accurately forecast installation costs and identify areas where investment will generate the most value. The structured decision-making process will involve assessing whether a location is of strategic importance, evaluating demand from MNOs and EV charging providers, determining fibre availability, and understanding the need for IoT sensors.

By leveraging cost data and assessing potential revenue streams such as small cell rental or EV infrastructure partnerships, the council will be able to weigh the financial and non-monetary benefits of each deployment. This process will ensure that smart infrastructure investments not only provide better connectivity for businesses, residents, and visitors but also align with both the council's overarching business case and the commercial interests of private sector partners.

Terms and Conditions for Multi-Stakeholder Management

The contract terms for PAS 191-compliant poles currently reside with a single supplier, North, which acts as the sole point of contact for all infrastructure-related issues. In the event of a fault, maintenance request, or technical issue, North will be contacted first and is responsible for addressing and resolving the problem.