SCOTTISH FUTURES
TRUST

Long-term infrastructure for Scotland: supporting a sustainable and thriving future

January 2026

Contents

Foreword

Infrastructure is the backbone of our economy, society, and environment. Economic infrastructure connects people and businesses; social infrastructure underpins essential public services; housing forms the very fabric of communities; and natural infrastructure protects our ecosystems and supports wellbeing.

Scotland's infrastructure is a complex set of interconnected systems which need to work seamlessly together to improve quality of life and underpin our national ambitions.

Infrastructure systems share a central characteristic – they comprise assets that are expensive, take a long time to plan and deliver, and last for decades. Each decision that is made in every infrastructure system can therefore have a generational impact. It is vital that those who influence and make the larger national decisions around investment priorities, as well as those who are charged with the stewardship of individual assets, do so with the long-term in mind. That is not easy, as uncertainty increases the further you look into the future, and generational thinking is not well suited to short-term political and profit and loss cycles.

This 30-Year infrastructure Needs Assessment – the first of its kind for Scotland – is intended to counter those short-term pressures. It offers a set of tools for strategic infrastructure planning and investment decision making over the decades ahead and comprises of the following four sections:

Drivers of Change – highlighting the five major trends of economic priorities, climate change, global security, public service reform and demographics, that will drive infrastructure development over the next 30 years. Planning and decision making at all levels and across all infrastructure sectors can be improved by taking these trends into account and recognising that they can each be influenced by the individual decisions we take – using infrastructure investment to maximise outcomes for people, places and planet.

Scotland's Infrastructure – drawing together a baseline understanding of Scotland's main infrastructure sectors in one place – to be built on and act as a reference source to improve cross sectoral understanding. With sector stakeholders, we have begun to consider the impact of the identified drivers on each sector, to draw out key challenges and opportunities, and paint a high-level picture of that sector over the coming 30 years.

Cross Cutting Themes – outlining the six themes of nature positive, prioritising place, data and technology, asset and climate resilience, demand dynamics and energy transition, which will support improved system thinking across infrastructure sectors. We see them considered to varying degrees within infrastructure sectors and believe they can be addressed more powerfully together. They provide a common language and an agenda for focus and collaboration.

Enabling Success – highlighting a series of insights from the Scottish Futures Trust (SFT), as a centre of infrastructure expertise, pointing to areas of focus and development around the infrastructure lifecycle from strategy and investment, through delivery to the increasingly important and sometimes overlooked management and maintenance of what we already have. All this can be underpinned through strong governance and partnerships as well as increased engagement with the public, to bring them on the journey of long term change.

Supporting Evidence

This Needs Assessment builds on the work of the Infrastructure Commission for Scotland. We intend it to be a staging point for further development and discussion, providing strategic insights to inform policy, improve practice, and guide investment. With support and further engagement from stakeholders we can go further. The drivers and cross-cutting themes could be developed into a transparent investment prioritisation framework, enhancing current approaches and building on the work of the Institution of Civil Engineers' Enabling Better Infrastructure global best practice guidance. We believe that such an approach could gain widespread political, business and societal buy-in to a sustained and stable investment programme integrated across infrastructure sectors and directed to improving the long-term outcomes for Scotland. Across all of our work, we will continue to focus on improving the infrastructure for Scotland, updating this Needs Assessment to inform Scotland's Infrastructure Strategy.

I would like to express my gratitude to the talented team at the Scottish Futures Trust and the many stakeholders who contributed to shaping this Needs Assessment. Your contributions have been critical in shaping what remains SFT's independent work. We will be seeking to engage further and welcome feedback on how this Assessment can provide a starting point to guide collective efforts in delivering sustainable infrastructure that supports a thriving Scotland – now and for generations to come.

Peter Reekie
Chief Executive, Scottish Futures Trust

Supporting
Evidence

01
Executive
Summary

Executive summary

Infrastructure plays a critical role in Scotland's daily life and long-term ambitions, underpinning essential public services, economic growth, societal wellbeing, and environmental resilience. This Needs Assessment, developed by the Scottish Futures Trust, provides a strategic framework to guide infrastructure investment over the next 30 years, addressing emerging challenges and opportunities.

Through the following sections we outline our approach to preparing this Needs Assessment and summarise our findings, concluding with a narrative on how to build upon good practice to deliver infrastructure effectively. Our analysis covers an assessment of the major national and international drivers that will influence infrastructure over the next 30 years, a review of the breadth of our infrastructure sectors, and system themes that can direct a joined-up model of infrastructure planning and investment.

Long-term infrastructure for Scotland

The goal of this Needs Assessment is to improve outcomes for Scotland with a 30-year view of key drivers, themes and approaches that can inform infrastructure decision making with a horizon that matches the generational lives and impact of the assets themselves.

It adopts Scotland's broad definition of infrastructure, encompassing economic, social, and natural assets, and reflects our infrastructure policy priorities.

Through futures thinking including scenario modelling, sectoral reviews and system thinking, this assessment highlights key drivers of change and interdependencies across Scotland's infrastructure systems. It provides strategic insights to align infrastructure investment with Scotland's policy priorities, to deliver long-term societal, economic, and environmental benefits.

This Needs Assessment aligns with Scotland's revised infrastructure investment framework to inform Scottish Government's draft 10-year Infrastructure Strategy (2026/27–2036/37). It highlights the importance of good practice implementation, including strategic prioritisation and collaboration across sectors, integrating long-term insights into investment decisions.

It provides guidance for policymakers, investors, and stakeholders, encouraging a systemic approach to infrastructure planning that supports Scotland's ambitions for an inclusive, net zero carbon economy. It is a non-statutory research-based guide produced independently by Scottish Futures Trust and we intend that future iterations will build on improved data, engagement, and strategic alignment to support robust decision-making.
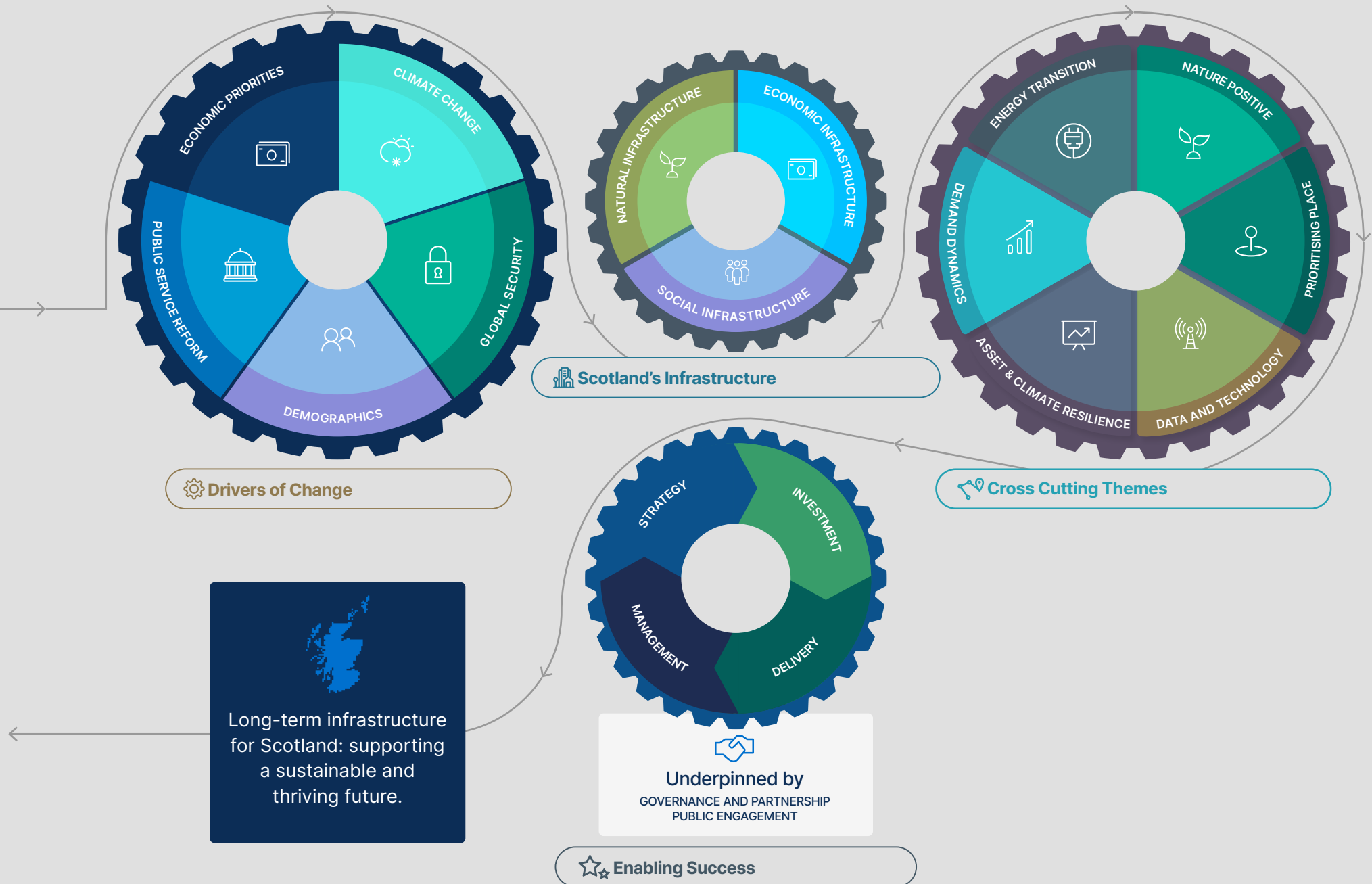
Figure 1 sets out the structure of the document and in this section we summarise:

- The key drivers of change - major trends that will impact infrastructure decisions over the next 30 years and which can be developed to guide prioritisation.
- Our analysis of Scotland's main infrastructure sectors including their opportunities, challenges and potential development path over the next generation.
- Cross-cutting themes which will tie infrastructures together and form an agenda for improved collaboration.
- Insights from Scottish Futures Trust on key areas of focus around the infrastructure lifecycle, to enable success.

We draw these together into high-level messages for policy makers and asset owners at the end of this section.

Figure 1: Assessing long-term need

Drivers of Change

- ECONOMIC PRIORITIES
- CLIMATE CHANGE
- GLOBAL SECURITY
- DEMOGRAPHICS
- PUBLIC SERVICE REFORM

Scotland's Infrastructure

- NATURAL INFRASTRUCTURE
- ECONOMIC INFRASTRUCTURE
- SOCIAL INFRASTRUCTURE

Cross Cutting Themes

- ENERGY TRANSITION
- NATURE POSITIVE
- PRIORITISING PLACE
- DATA AND TECHNOLOGY
- ASSET & CLIMATE RESILIENCE
- DEMAND DYNAMICS

Enabling Success

- STRATEGY
- INVESTMENT
- DELIVERY
- MANAGEMENT

Underpinned by
GOVERNANCE AND PARTNERSHIP
PUBLIC ENGAGEMENT

Long-term infrastructure for Scotland: supporting a sustainable and thriving future.

Key drivers of change

Five major trends will shape Scotland's infrastructure needs over the next 30 years. Every infrastructure strategy, asset management plan and investment decision should both be shaped by these drivers, and bring an opportunity to influence them:

Demographics

Scotland's population is **projected to grow by 6.2% by 2047** from 2022 figures, driven by migration, alongside an ageing population and declining numbers of children. Spatial distribution changes, such as urbanisation and growth in the east of the country alongside depopulation in some western areas, will impact infrastructure needs, particularly housing, health and care, utilities, and transport. Infrastructure decisions can impact these shifts to ensure balanced regional development, to safeguard our communities, and to deliver effective public services, recognising the costs to communities and public services of unmanaged population changes.

Climate change

The climate is changing. Adapting to those changes and mitigating the effects through transition to net zero emissions is set to be the infrastructure challenge of our generation. Decisions must balance risks such as flooding, elevated temperatures, and water scarcity, with delivering emission reductions, harnessing nature-based solutions, energy efficiency, and behaviour change in the most economically efficient and societally acceptable ways possible. A system approach is needed, addressing areas which are behind ambitions, and continuing the progress made.

Global security

Scotland's infrastructure must adapt to rising geopolitical uncertainty and natural risks, addressing resilience in areas like energy, telecoms, food, and water. Balancing global connectedness and cyber security across infrastructure systems is likely to become an increasing challenge. Continued collaboration between UK and Scottish Government is critical to align national security and resilience priorities with economic, social and environmental goals.

Economic priorities

Infrastructure is vital for driving inclusive growth and supporting emerging sectors such as renewable energy, hydrogen, and carbon capture, while continuing to address the needs of existing valuable sectors such as digital technology, food and drink, life sciences, creative industries and tourism. Investments in enabling infrastructure, such as transport, telecoms, and housing, will catalyse private sector activity and spatial development. Infrastructure investments must also continue to be a key tool to support vulnerable communities and their engagement in the economy. Aligning planning and decision making with the right national regional and local economic geographies will be key.

Public service reform

Public services are being reformed for efficiency, to join-up, prevention and fiscal sustainability. **Infrastructure decisions can deliver shared assets in support of integrated services, enable technology-driven delivery models, and promote place-based investments to support community wellbeing.**

A strong foundation

In delivering this Needs Assessment we have worked with stakeholders to review the existing asset base, as well as the challenges and opportunities across Scotland's main infrastructure sectors, to demonstrate how the identified drivers will impact specific sectors. Our sectors are diverse, each playing a critical role in delivering the country's long-term ambitions. By addressing sector-specific challenges and opportunities, Scotland can ensure the value of both existing and new infrastructure is realised:

Transport

Scotland's transport system is key to connectivity, economic growth, and sustainability. It is unlikely that Scotland's underlying transport infrastructure will be significantly expanded in the next 30 years. Instead, the focus will be on upgrading, maintaining and decarbonising Scotland's transport systems, with greater use of technology to improve service accessibility. In support of climate change mitigation and resilience, opportunities exist in behaviour change to reduce car dependency and promote alternative modes, alongside enhancing public transport, integrating sustainable freight systems, and leveraging technology to improve efficiency and resilience. In addressing the complexity of need, there should be consideration of innovative approaches to finance and delivery such as road pricing or congestion charges.

Energy

Scotland leads the UK in renewable energy, with 70% of electricity generated from renewables in 2023. In the next 30 years, the energy system is likely to be unrecognisable, both at home, in industry and in services such as transport, as we continue to address climate challenges while responding to new energy technologies. Opportunities in offshore wind, hydrogen, and carbon capture, utilisation, and storage offer significant potential to drive economic growth and support net-zero goals. To achieve this ambition, challenges to address include grid capacity, energy pricing barriers, workforce skills,and decarbonising heat. Implementation must also address fuel poverty and ensure a Just Transition for communities.

Waste

Scotland's waste sector in the next 30 years is likely to continue its current trajectory, making strides in reducing landfill use and adopting circular economy principles. Through new technologies, by addressing public opposition to new solutions and by establishing a clearer waste market, new circular economy infrastructure is likely to be more prevalent. New and cleaner technologies including digital innovations, advanced recycling systems, and energy from waste technologies are likely to support net-zero ambitions and foster a sustainable, resource-efficient economy.

Telecommunications and digital

Scotland's telecoms sector underpins public services and economic growth, with advancements in broadband and 5G improving connectivity. Over the next 30 years this is likely to be an area of increased reliance in our economy and society, including the delivery of public services and in-home smart infrastructure. Expanding 5G, enabling green data centres, and integrating digital technologies into public services offer significant opportunities to address inequalities and support innovation and resilience. However, rural areas still face challenges in digital inclusion, and cyber threats remain a concern, requiring sustained action.

Water (incl. flood management)

The water sector is vital for public health, economic activity, and environmental resilience. Over the next 30 years the focus for water provision is likely to be maintenance and renewal of the significant asset, alongside investment to support climate adaptation and mitigation, including flood management. Evolving areas with a possible draw on water such as hydrogen and data centres add a level of uncertainty to projections. Opportunities include leveraging data and technology for efficiency, adopting nature-based solutions for climate adaptation, and expanding hydropower capacity. The sector challenges to address include the ageing infrastructure, climate risks, and increasing residential and commercial demand. Long-term strategies must balance sustainability, affordability, and resilience.

Health and social care

Rising demand, ageing infrastructure, and financial pressures affect Scotland's health sector. Over the next 30 years, our health services are likely to be very different, with physical infrastructure provision focusing on areas where home or technical solutions are not appropriate. The ageing demographic will impact on the type of services in demand and therefore how infrastructure needs to respond. Affordability barriers will likely require more innovation, and consideration of public-private partnerships may be necessary. Immediate opportunities to challenges include digital health innovations, preventative care focussing on place-based primary care and integrated health and social care services. Addressing health inequalities and supporting workforce development will be essential to sustain high-quality care and adapt to demographic challenges.

Housing

Scotland faces a housing crisis, with demand for affordable homes exceeding supply and challenges in retrofitting for net-zero goals. Over the next 30 years we are likely to have a different approach to housing supply, with housing distribution responding to the changing demographics, while the ageing population and their accessibility needs to remain in their homes will need to be factored into provision. Housing will continue to evolve to support climate priorities. While the current issues are complex and systemic, innovative delivery and construction techniques, reusing vacant properties, and community-led developments offer solutions to address affordability, supply, and sustainability. Collaboration is essential to meet Scotland's changing demographic and environmental needs.

Emergency services

Scotland's emergency services face challenges including ageing infrastructure, rising demand, and climate-related risks like wildfires and flooding. Over the next 30 years the traditional infrastructure needs of this sector are likely to continue to change and reduce, through more community models of co-location, integrating with other public services. Digital and technological alternatives will be developed, supporting this reduced use of traditional infrastructure, supporting real-time resource management and service efficiency. Opportunities, including co-locating services, using technology for data-driven delivery, and adopting prevention-focused models can help address current challenges, improving efficiency and outcomes, while addressing evolving public safety needs.

Education

Over the next 30 years demographic changes will impact this sector, changing the spread of demand and related infrastructure. Infrastructure is likely to be reduced, although varied across early learning to Higher Education. There will be greater online learning, where developmental, social or other reasons for in-person education is not essential. **Asset flexibility to respond to changing life stages of learning and in-year cycles will be more integrated.** Modern climate-resilient infrastructure is critical to supporting learners of all ages and addressing socio-economic attainment gaps. Immediate opportunities include leveraging digital technology, embedding sustainability into the curriculum, and aligning education with labour market demands. Strategic investment will ensure the sector remains inclusive, equitable, and future-ready.

Justice

The justice sector faces challenges such as prison overcrowding, case backlogs, and ageing facilities. Over the next 30 years this sector is likely to see changes in how aspects of the service are delivered, using automation and remote communication, reducing the need for some administrative infrastructure functions. **New approaches to offending behaviour, and by addressing reasons for crime, may reduce overcrowding, minimising the need for significant additional assets.** Further opportunities include modernising assets and leveraging digital technology, while a focus on integration with other public services will improve efficiency and outcomes.

Defence

Over the next 30 years, the current trajectory of a changing world is likely to see increased spending on defence infrastructure, with that infrastructure technologically advanced. While Ministry of Defence (MoD) locations in Scotland may not increase, they are likely to be of even greater importance to UK territorial integrity. **Opportunities already lie in naval shipbuilding, advanced technologies, and international collaboration, while challenges include ageing assets, skills shortages, and climate-related risks.** Investment in resilient, modern infrastructure is vital to maintaining Scotland's leadership in defence innovation. Anticipated investment by the MoD should be harnessed for the benefit of communities and defence sector in Scotland, while there should be greater collaboration and integration with civil authorities to address emerging risks.

Natural infrastructure

Scotland's natural capital is vital for biodiversity, climate resilience, and economic activity. Over the next 30 years the role of natural capital is likely to be increasingly recognised and integrated into our practises: for economic growth; in addressing climate mitigation and adaptation; in support of wellbeing, also supporting prevention measures; and essentially, a greater focus on biodiversity preservation and promotion, to sustain these impacts. Current challenges include climate impacts and biodiversity loss, but opportunities lie in nature-based solutions, peatland restoration, and emerging natural capital markets, while data and technology provide opportunities for more effective monitoring of assets. Collaboration across sectors will ensure Scotland's natural assets are protected and enhanced for future generations.

Culture and recreation

Scotland's culture and recreation sector contributes to economic growth, wellbeing, and national identity but faces funding constraints and climate risks. Over the next 30 years the sector is likely to grow in some areas, linking to tourism growth opportunities, while others such as community culture and recreation are likely to be sustained at current levels, but more integrated to wider policy ambitions such as early intervention to support prevention measures, and providing greater digital interaction opportunities. Expanding opportunities for public-private partnerships, philanthropic support and community fundraising should be considered. While investment in sustainable tourism, digital technologies, and recreational infrastructure such as walking and cycling networks will ensure the sector continues to thrive.

Some sectors are likely to be unchanged in the next decades, with a greater focus on maintenance and climate resilience; whereas others are on a pathway where infrastructure is more likely to increase in type or evolve in form; while finally a few sectors are transforming with infrastructure likely to be vastly changed in 30 years time, both in type of assets within sectors such as energy, or for some public services physical assets may no longer be the main focus to facilitate service delivery, with a greater balance of technological alternatives.

Given this, it would be valuable to build out a cross-sectoral picture of Scotland's infrastructure, with a co-ordinated data structure, at least covering asset location, and for public sector detailing infrastructure value and condition/maintenance need, would be valuable. This could head towards a national infrastructure digital twin. For some assets, there are opportunities to consider alternative infrastructure funding models, to innovate and support ambitions.

Cross-cutting themes

We believe to manage and develop infrastructure that works for the people of Scotland, we need to focus on greater integration and system thinking. A focus on interdependencies and synergies is essential to understand how our infrastructure interacts and can be best developed for multiple impacts, creating greater value.

We have identified six cross-cutting themes from our analysis, which can provide a common language and agenda for cross-sector collaboration.

Energy transition

The transformation of Scotland's energy infrastructure is pivotal, requiring significant investment and coordination across sectors.

Key considerations include:

- **Investing for the transition:** Private investment will be necessary to meet the scale of change required. Governments, regulators, and industry must address funding challenges, behavioural change, and planning complexities to deliver on statutory climate commitments by 2045. A clear route map is needed to provide market certainty.
- **A defined path:** Developing a clear, prioritised energy transition action plan aligning with UK strategies, such as the 10-Year Infrastructure Strategy. Collaborating with the National Energy System Operator (NESO) and the Office of Gas and Electricity Markets (OFGEM) to prioritise public investment, unlock private sector funding and address barriers such as energy pricing, and focus on grid innovation, renewable energy, and storage market development.
- **Supporting Scottish impacts:** Ensuring the energy transition benefits Scottish communities through supply chain development, community wealth-building principles, and alignment with the Just Transition Commission's conditionalities guidance. Energy transition must be built in to plans for all assets across all infrastructure sectors, with heat decarbonisation presenting a particular challenge. There will be new infrastructure assets classes and networks to be built out, including charge points and heat networks. Place-based planning along with integration of energy transition into asset lifecycles and maintenance plans will help minimise the overall cost and improve societal acceptance. Lessons should be learned from the oil and gas sector to maximise societal benefits while balancing upstream and downstream impacts.

Nature positive

Scotland's natural capital is a fundamental asset, supporting economic output, biodiversity, and climate resilience.

Key considerations include:

- **Nature-based climate Solutions (NbS):** Prioritise cost-effective, nature-based solutions to address challenges such as flooding, landslides, and reforestation, building on biodiversity and adaptation policy. NbS can deliver multiple benefits, including carbon mitigation, biodiversity promotion, and climate adaptation, while creating economic opportunities and jobs. This should include both macro-level infrastructure but also micro-level NbS, such as green roofs and permeable surfaces.
- **Greenspace and wellbeing:** Nature positivity should be built into decision-making, maintaining and enhancing biodiversity in development activity, and promoting biodiversity across the public sector estate and linear infrastructure peripheries. Scottish Government should prioritise investment in diverse green infrastructure to improve urban settings, support wellbeing, and for climate resilience.
- **Balanced ecosystem management:** Decisions on natural assets must consider long-term trade-offs across climate mitigation and adaptation, wellbeing, biodiversity, and economic use. Transparent decision-making and a robust understanding of ecosystem interactions are essential to guide investment and address competing demands, such as water usage for agriculture, industry, and hydrogen production.
- **Data and market frameworks:** Build on NatureScot's work on a natural capital baseline to create a comprehensive Scottish picture. Develop the Natural Capital Market Framework to expand opportunities for trading in carbon, biodiversity, and other resources while ensuring environmental protection.

Prioritising place

Infrastructure investment must reflect the unique needs of Scotland's diverse communities and regions.

Key considerations include:

- **National vs. local decision making:** Balance national, regional, and local priorities to ensure strategic investment while addressing nuanced local needs. Regional governance structures, such as Regional Economic Partnerships, should be leveraged to facilitate development and remove unnecessary competition.
- **Place typologies:** Build on the National Planning Framework 4 to align place archetypes with infrastructure investment, having consideration of models such as Scotland's Population Health framework, to create comprehensive typologies.
- **Neighbourhoods:** Create spaces and locations which support targeted and collaborative prevention through local approaches to inclusive growth and community wealth building.
- **Flexible assets:** Design public assets to adapt to changing and diverse community needs, enabling shared use and efficient service delivery.

Data and technology

Data and technology are critical enablers of efficient infrastructure and public service delivery.

Key considerations include:

- **Data insights:** Leverage data as a key asset by adopting national data standards and open-source principles where feasible. Enable better decision-making and innovation through improved data sharing and management. This should include re-visiting the value of the Scottish Government Digital Strategy for Planning.
- **Smart infrastructure:** Expand the use of Internet of Things devices, digital twins, and smart grids, to optimise asset performance, improve resilience, and support decarbonisation.
- **Technology innovation:** Foster innovation in sectors such as the circular economy, and in support of the energy transition, by creating conditions that stimulate technological development. Address challenges such as cyber security and digital trust to ensure equitable access and safety.
- **Addressing the balance:** address inclusion, cyber security and data privacy challenges. Strengthen leadership and co-ordination to accelerate investment to realise benefits of data and technology.

Asset and climate resilience

Existing assets must be managed effectively while adapting to climate and service challenges.

Key considerations include:

- **Asset longevity and flexibility:** Where new delivery models are being developed, there is a need to address interim investment to maintain existing assets effectively, while progressing the transition.
- **Investment hierarchy:** Continue to implement the Scottish Government's Infrastructure Investment Hierarchy to balance maintenance, enhancement, and new investment priorities.
- **Climate resilience:** Focus on nature-based solutions as a first step in climate adaptation, complemented by new technology and regulation.
- **External resilience:** Strengthen infrastructure against global risks, having conducted a review of vulnerabilities.

Demand dynamics

Scotland faces increasing demand pressures across public services and natural resources.

Key considerations include:

- **Behaviour change:** Promote prevention and behaviour change to reduce demand on public services, improve outcomes, and address climate challenges. Each sector should consider how it can harness behaviour change models to support appropriate demand management.
- **National conversation:** Engage communities in a national dialogue on demand challenges across infrastructure services, including energy, transport, and the evolving model of public services, exploring trade-offs and priorities for our future infrastructure.

Enabling success

To achieve Scotland's infrastructure ambitions over the next 30 years, a cohesive approach is required, moving from understanding need to clear and effective implementation. This section outlines the critical enablers for success across the infrastructure lifecycle, focusing on strategy, investment, delivery and management, underlined by partnership and governance, and public engagement.

Strategy

A long-term infrastructure strategy is essential, supported by evidence-based, needs-driven asset strategies.

Key considerations include:

- **Needs-based asset strategies:** Develop comprehensive asset strategies across the public sector, embedding the Scottish Government's Investment Hierarchy. These strategies should balance short-term no-regrets decisions, with long-term planning aligned to future service needs and geographic priorities. A place-based approach should bring together public bodies to identify cross-sector efficiencies and opportunities for asset sharing to support improved public service delivery.
- **Strategic prioritisation:** Strategic prioritisation provides the mechanism through which Scotland ensures that investment in infrastructure both meets current needs and anticipates future demand. A system-wide approach to prioritisation should assess synergies, resilience, value for money and deliverability, ensuring resources are directed to projects that deliver the greatest long-term economic, social, and environmental value. The drivers and cross-cutting themes we have identified can be further developed to form a prioritisation framework.
- **Key infrastructure systems:** Priority areas include energy transition, nature-based and climate resilience, digital and data infrastructure, low-carbon transport systems, water resilience, and place-based community infrastructure. Early prioritisation of enabling projects, such as grid modernisation, will unlock future opportunities.

Investment

The scale of infrastructure change requires substantial public and private investment.

Key considerations include:

- **Private investment principles:** Create an environment that attracts private investment by providing policy clarity, stable market conditions, and transparency.
- **Mobile capital and confidence**: Focus on attracting patient, long-term investment aligned with Scotland's 30-year need, creating informed clients, transparency and market confidence. Consider new innovative funding instruments and models, however ensure any new consumer charges are coherent across portfolios and consider affordability, particularly for vulnerable groups.
- **Policy and regulation:** Effective dialogue, policy alignment and shared frameworks for infrastructure planning and regulation should be considered, to strengthen delivery, promote cross-border investment, and create market confidence. Regulation to unlock enabling infrastructure is a particular opportunity area.

Delivery

Innovative, outcome-focused delivery models are essential to translate strategies into real-world infrastructure.

Key considerations include:

- **Construction pipeline and procurement:** Use procurement to align infrastructure investment with economic, social, and environmental priorities; and to provide clear signals to the construction industry on ambitions. Encourage innovation, digital adoption, and modern methods of construction while ensuring fairness and accountability.
- **Construction and delivery quality:** Continue to drive quality in design and delivery in the construction sector, creating innovation and value for money. Feedback loops through robust evaluation should be embedded in all construction projects, to support continued improvement.
- **Capacity building:** Invest in skills, systems, and institutions to address workforce shortages and prepare for emerging technologies. Build delivery capability, particularly within the public sector to ensure readiness for future challenges.

Governance and partnership

Strong governance will ensure alignment of policy, investment, and delivery across sectors.

Key considerations include:

- **Structural alignment:** Foster collaboration across national, regional, and local levels by aligning governance structures and priorities, to promote coherent, place-based decision-making. Strengthen public-private-community partnerships to enhance coordination and resource sharing.

Management

With 80% of our current infrastructure systems likely still to be in use in 2050, managing those assets effectively is an essential component of making the best use of assets across their lifecycle.

Key considerations include:

- **Making the best use of assets:** asset management needs to consider viability, sustainability and relationship to long-term asset strategies. Ageing assets with required maintenance in the public sector require tactical management, to balance short and longer-term priorities.
- **Tools and practice:** New management tools such as digital twins and smart technology should be used to support effective asset management, including predictive maintenance programmes. Skill development and consistent practise can support efficiencies.

Public engagement

Public understanding and acceptance are critical to successful infrastructure reform.

Key considerations include:

- **Meaningful engagement:** Integrate sustained public engagement into long-term planning, to build shared ownership and resilience. This will be vital for challenging transitions, such as climate adaptation or public service delivery changes.
- **Behaviour change:** Support preventative behaviours through systemic structures and clear communication, ensuring communities are engaged and informed, while having the opportunity to guide on priorities.

Stakeholder messages

Through our analysis in this report, we have highlighted messages and areas for infrastructure stakeholders to consider.

While these may be of general interest to anyone involved in the infrastructure sector, each of us will have a varying role in reflecting and acting on those messages. To help with that assessment, we summarise some key messages for Scottish Government, Ministers, private sector, other public sector and lastly ourselves, the Scottish Futures Trust.

Scottish Government

Strategic leadership

Integrate the Needs Assessment into its overall approach to infrastructure planning, investment and delivery:

- Establish and maintain a forward-looking function, linked to the Future Trends for Scotland analysis, the long-term drivers and cross cutting themes we have identified, and build them into future policy development, prioritisation and investment decision making.
- This should include balancing short-term no-regret investments for ageing assets with long-term planning and explicitly consider the investment hierarchy. Investment simply in "replacement" is unlikely to be optimal.
- To improve consistency and quality of evidence, commit to addressing key data gaps in assessing infrastructure need, including data standards across infrastructure sectors and establish comprehensive sectoral asset strategies. All infra sectors should refer to a single verified version of the truth for their future needs planning and explicitly consider investment decisions that respond to the long-term drivers.
- Maximise the potential for reinforcing greater collaboration and inclusion of cross-sectoral and system priorities, alongside implementing key enablers to unlock investment.

Collaboration and co-ordination

Commit to ongoing engagement with SFT and other partners to refine the Needs Assessment analysis, supporting the development of a 5-yearly review.

Public engagement and behaviour change

Foster public understanding and acceptance of infrastructure reforms through sustained engagement, co-design, and behaviour change initiatives.

Ministers

Strategic leadership

Recognise the inherent tensions between political cycles and infrastructure life-cycles by directing a long-term approach to infrastructure investment, committing to building on the output of this Needs Assessment to establish an evidence-based model of decision-making.

Investment and prioritisation

Consider the opportunity for the identified drivers to be built into a prioritisation methodology, that would align with their strategic priorities, and gain broad stakeholder support to give long-term pipeline stability.

Cross-border collaboration

Continue to work with the UK Government to secure critical investment and address shared priorities, such as energy grid upgrades, energy pricing challenges, cybersecurity, digital connectivity and resilience to external threats and events.

Private sector

Investment alignment

Engage with blended public / private funding and financing approaches, to co-deliver infrastructure projects and programmes, building markets and serving all of our communities.

Skills and competence

Invest in competence building and support workforce reskilling initiatives for a Just Transition.

Innovation leadership

Drive technological advancements in smart infrastructure, low-carbon solutions, and data-driven tools to enhance efficiency and sustainability.

Collaboration and partnership

Engage with the public sector to discuss alignment of investment priorities with local, regional and national priorities.

Other public sector

Improved evidence base

Contribute to the refinement and improvement of data, data standards and evidence base in support of the ongoing refinement of Scotland's long-term infrastructure needs.

Investment and prioritisation

Consider the drivers and cross-cutting themes we have identified and where they can be usefully integrated into long-term investment decision-making to support resilient infrastructure.

Integrated service delivery

Explore across the infrastructure system the potential for greater integration of decision-making with partners, to deliver co-located, efficient public services and infrastructure networks, improving outcomes for communities.

Scottish Futures Trust

Strategic leadership

We will engage with stakeholders across the infrastructure sector to seek feedback on this work, and if there is a broad level of support, commit to leading on a refreshed Needs Assessment through a 5-yearly process, improving the evidence base and refining and reviewing key messages.

Collaboration and co-ordination

We will explore with key Scottish Government stakeholders and agencies how the drivers and cross-cutting themes can influence their long-term decision-making, refining and reviewing to develop a framework for strategic alignment, that could be used as a prioritisation tool.

Implementation expertise

We will work with stakeholders on delivering priorities identified in the Needs Assessment, focusing on enablers such as procurement strategies, capacity building, innovative delivery models and funding mechanisms.

Private investment

We will support the government and its agencies in creating market certainty and clarity to attract private capital, particularly in areas such as energy transition, digital infrastructure, and nature-based solutions.

02
Introduction & Objectives of Needs Assessment

Introduction and Objectives of Needs Assessment

Introduction

We interact with infrastructure every day, in nearly every part of our lives. It underpins essential public services such as health and education, it connects us to the people, places, and markets we value through transport and telecommunications networks, and it provides the spaces where we spend our free time, from local parks to national waterways.

Much of this infrastructure has been in place for many decades and requires continual maintenance and adaptation to remain fit for purpose; whilst new infrastructure assets often take years to plan and deliver. Each investment decision can have generational impact, and must be well-informed and interconnected so each asset serves us effectively over the long term and delivers value for money.

> The Scottish Government should publish... a system wide Scottish Infrastructure Needs Assessment covering all infrastructure sectors defined by the Scottish Government and we recommend the inclusion of natural infrastructure. The Assessment should be refreshed and updated at least every 5 years thereafter.
>
> INFRASTRUCTURE COMMISSION FOR SCOTLAND, 2020

As part of its ongoing improvement efforts, the Scottish Government has been working to refine how it makes investment decisions, looking beyond the short and medium term into the longer term. This Needs Assessment forms part of that process. It provides a framework for long-term investment by examining the opportunities and challenges Scotland may face over the next 30 years.

The Scottish Futures Trust (SFT) has been tasked with producing Scotland's first Needs Assessment, considering the outcomes Scotland wants to achieve from its infrastructure, while addressing emerging opportunities and challenges.

To guide this ambition, this Needs Assessment identifies major national and international drivers, key sector-specific considerations, and cross-cutting themes that help illuminate broader system issues.

Our findings are intended to inform short-to-medium-term investment decisions, ensuring that infrastructure can play its full role in delivering long-term ambitions. This represents an opportunity to take a different approach, one recommended by the Infrastructure Commission for Scotland by integrating long-term insights into today's decisions and better aligning current and future needs.

Role and definition of infrastructure

Unlike many nations that often have a narrower focus on economic infrastructure, the Scottish Government's definition is broad to reflect the essential interaction of economic, social and natural assets.

> *The physical and technical facilities, natural and other fundamental systems necessary for the economy to function and to enable, sustain or enhance societal living conditions.*

What kind of infrastructure exists and how well it works affects the success and prosperity of communities. Yet this is not a one-size-fits-all, with communities requiring different infrastructure to support their wellbeing. Additionally, what we may need today can change, in response to global and local influences. The world is increasingly uncertain, with climate change pressures likely to be significant over the term of this Needs Assessment, alongside political and economic uncertainty, as previously stable trade and political partnerships evolve. As such not only do we need to think over the longer-term to ensure infrastructure fulfils its role, but consider the interconnection of infrastructure types in a global system, with resilience increasingly central to our thinking.

We need to consider where and how we should build infrastructure to meet the needs of current and future generations. This is not a simple task and there is no single model to arrive at the answer to this question. It will continue to require a partnership approach across the public, private and third sectors, keeping community priorities part of decision-making.

Scottish Government's infrastructure investment framework

This Needs Assessment fits within a revised Scottish Government infrastructure investment framework, aligning government decision making, including an extended 10-year Infrastructure Strategy.

The Infrastructure Investment Plan (2021/22 to 2025/26) established the vision for Scotland's infrastructure, supported by a 5-year capital investment plan. It detailed the improvement process to support better infrastructure investment decision-making and the vision for infrastructure that supports an inclusive, net zero carbon economy.

The draft 10-year Infrastructure Strategy (2026/27 to 2036/37) builds upon the previous 5-year Infrastructure Investment Plan, taking a short to medium-term perspective. As part of the consultation process, the Infrastructure Strategy will consider the key messages from this Needs Assessment. Figure 3 provides the full infrastructure investment decision-making framework, illustrating the role of the Needs Assessment.

Figure 2: Infrastructure categories
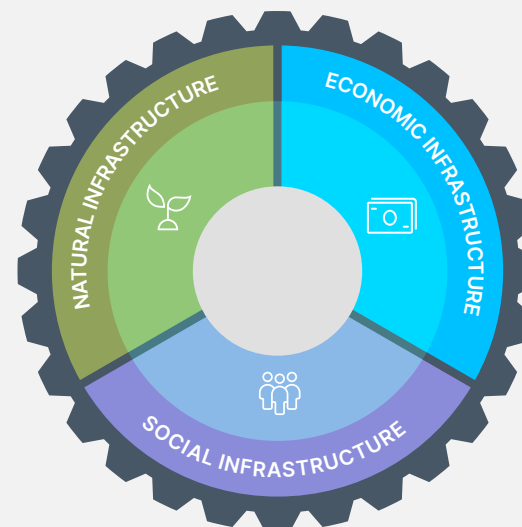
Scotland's Strategic Infrastructure Investment Framework

The Needs Assessment supports an integrated and long-term approach to infrastructure investment as detailed within the draft Infrastructure Investment Plan (2026/27 - 2036/37), published alongside this document, for consultation. Figure 3 notes how these documents are intended to interact alongside other governance structures, to support decision-making ambitions.

Figure 3: Scotland's Strategic Infrastructure Investment Framework

30-year Needs Assessment	10-year Infrastructure Strategy	Spending Review	Budget	Infrastructure Programme and Project Portfolio
Sets context for Investment Strategy	Sets broad infra priorities for Spending Review	Prioritises portfolio allocations	Prioritises budget for investment	Investment Programmes Future Projects Project Pipeline
REFRESHED EVERY 5 YEARS	REFRESHED EVERY 5 YEARS	REFRESHED EVERY 2-3 YEARS	REFRESHED ANNUALLY	LIVE DOCUMENTS, RECORDING PLANS, DECISIONS & PROGRESS

Summary methodology

Scotland's definition of infrastructure is extensive, including economic, social and natural infrastructure. Like many developed economies, the ownership, development and future planning of infrastructure sits across the public, private, third and community sectors. This Needs Assessment takes a strategic approach in assessing what infrastructure will be needed in the future, reflecting available data. The components of our methodology are detailed below, which have allowed us to identify the key drivers influencing infrastructure need, the opportunities and challenges for individual infrastructure sectors, cross-cutting themes illustrating system considerations across all sectors, and enablers to support effective infrastructure implementation.

The components of the Needs Assessment methodology are:

Futures thinking

Futures thinking, including considering policy priorities within a wider mapping of trends and megatrends[1] and scenario modelling of some discrete futures, prioritised by stakeholders. The internal national policy priorities alongside external trends and megatrends establish the key drivers infrastructure needs to consider in investment decisions. This includes well-rehearsed megatrends such as climate change alongside emerging trends such as global security.

Scenario modelling takes discrete variables identified as important by stakeholders and tests the impact on infrastructure, based on historical patterns. This provides a spectrum of how infrastructure may be affected by those key variables. There are some disruptors however, where sectoral forecasting based on historical patterns is not applicable. This is particularly challenging in areas affected significantly by climate change such as water and energy; or areas where technological developments are opening up new delivery models such as in many public services. These sectors require additional analysis complementing the scenario modelling, discussed in Appendix C. This is addressed through other components of the Needs Assessment methodology.

Sectoral picture

Our best understanding of **existing infrastructure by sector**, including sectoral challenges and opportunities. This allows for the more nuanced consideration of individual sectors, including any changes to historical patterns of demand, addressing any future thinking gaps.

Systems approach

Systems thinking, both through a cross-sectoral review and considering spatial influences and distinctiveness, drawing on Scotland's National Planning Policy including spatial plans. This allows for a sense check of Needs Assessment cross-cutting themes that emerge from the analysis to date, joining up sometimes disparate but interconnected infrastructure. Systems thinking supports best value considerations in a time of challenging public spending.

Enabling success

Implementation needs to be central to any infrastructure vision. Whether signalling clearly to the private sector in order to mitigate investment risk, or considering good practice finance and construction approaches that help drive effective implementation. The Scottish Futures Trust as Scotland's infrastructure centre of expertise, has identified enablers for successful infrastructure implementation across the infrastructure lifecycle.

Figure 4 illustrates the component parts of the Needs Assessment methodology.
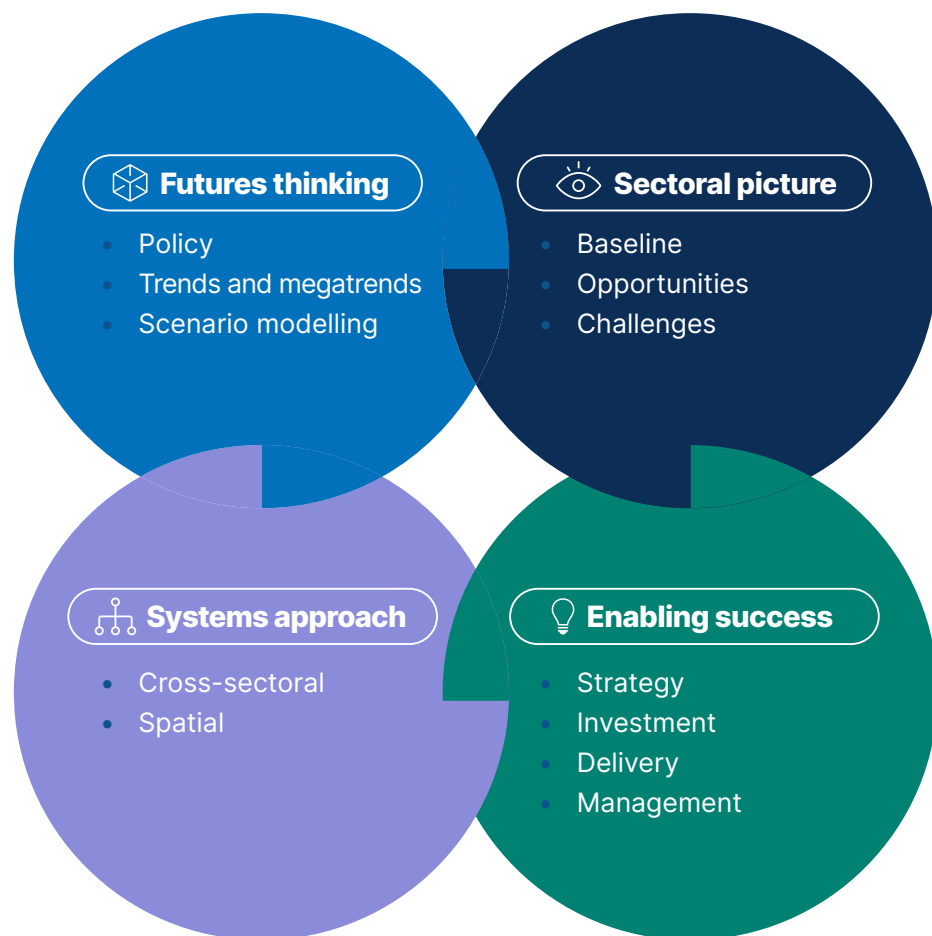

Futures thinking
- Policy
- Trends and megatrends
- Scenario modelling

Sectoral picture
- Baseline
- Opportunities
- Challenges

Systems approach
- Cross-sectoral
- Spatial

Enabling success
- Strategy
- Investment
- Delivery
- Management

Figure 4: Needs Assessment methodology

Limitations and looking ahead

While we have reviewed Scotland's rich asset base, as set out in Appendix B, this Needs Assessment is not a detailed audit of individual sectors' assets against future needs, which would require a full grasp of asset condition and of service delivery ambitions alongside committed investment. Neither is it framed within a fiscal envelope, unlike previous UK National Infrastructure Commission assessments.

Instead, through the outlined methodology, it provides an assessment of significant drivers of change relevant to infrastructure, alongside individual sectoral opportunities and challenges and finally a system analysis that brings together this top-down and bottom-up assessment, with cross-cutting themes. Within this framework we highlight some key sectors where changes are likely to require greater consideration and identify delivery challenges and priorities to support implementation.

Importantly we have begun to consider how this methodology and output could be improved for the proposed 5-yearly review of strategic need, recommended by the Infrastructure Commission for Scotland. The Scottish Government is currently developing medium-term sectoral asset strategies, which are intended to be influenced by the strategic messages from this Needs Assessment.

These will be the first step towards more comprehensive asset management plans, where not already available. While a timeline is not yet confirmed, it is anticipated that the ongoing Scottish Government infrastructure improvement process will see consistent data developed for these asset strategies, informing the 5-year review. Additionally, the focus of Regional Economic Partnerships and related spatial plans provides a significant opportunity to build upon the National Planning Framework in future needs assessments.

Finally, we have an ambition to improve upon the level of engagement, which we summarise in Appendix A. Views and recommendations from this engagement were valuable contributions to our overall evidence gathering and analysis. **There is significant expertise to draw upon in Scotland** and while we engaged in phases, more could be done to harness that expertise. That includes building on the public engagement delivered by the Infrastructure Commission for Scotland to clarify public infrastructure priorities. It is our intention to begin the work now, to improve upon both the data and engagement approach, to better inform and guide the 5-year review.

How to use this Needs Assessment

The analysis and our conclusions is intended for a range of stakeholders. We provide key messages at each section of our findings, with a summarised and targeted set of messages in the executive summary aimed at Ministers, Scottish Government, other public and private sector organisations and the Scottish Futures Trust.

Our analysis is structured around:

1 >

Drivers of change, including significant policy direction and wider trends that infrastructure will need to respond to over the next 30 years.

2 >

Sectoral reviews which while not a full audit of assets, are framed around sectoral opportunities and challenges and driver considerations.

3 >

System analysis that resolves around six cross-cutting themes, with related areas for consideration.

4 >

Enabling success, focusing on the critical enablers to move from understanding need to clear and effective implementation.

In delivering this Needs Assessment we have drawn upon the available evidence, while addressing the complexity of the infrastructure system.

Our assessment should be considered a live document, that through engagement, improved data and analysis, we continue to identify and establish the necessary infrastructure investments for Scotland. Our findings reach beyond Scottish Government and policy, with relevance to the private sector, third and community sectors, who each have a role in developing and managing the country's infrastructure.

While this Needs Assessment has no statutory status, our analysis has informed the context for Scottish Government's new Infrastructure Strategy, and we anticipate further consideration by government of our findings during the Strategy's consultation period.

We would encourage you to delve into the appendices and recognise the strength and opportunities our mature asset base provides. There are areas that need to develop for the changing world, however we are not starting from a low position. We believe this Needs Assessment provides a clear direction for how to prioritise and consider infrastructure investment for long-term societal, economic and environmental resilience and prosperity.

Strategic Environmental Assessment

We considered the Environmental Assessment (Scotland) Act 2005 in order to determine whether a Strategic Environmental Assessment (SEA) was required for this Needs Assessment. We concluded that an SEA was not required. We reached this conclusion on the basis that:

- The Needs Assessment is a high-level assessment of Scotland's long-term infrastructure need for the next 30 years, informed by analysis. It is intended to inform future plans or policies (such as the Infrastructure Strategy) which may themselves require an SEA, but is not in itself a "plan, programme or strategy" to which the 2005 Act applies.

- The Needs Assessment is not a legislative, regulatory or administrative requirement, and does not set the framework for future development consent of projects.

- Even if the Needs Assessment were a plan, programme or strategy to which the 2005 Act applies, it would likely be exempt from the requirement to undertake an SEA, as the Needs Assessment in itself will have no/minimal effect on the environment.

03

Drivers of Change

Drivers of Change

Key drivers

In this section we discuss the key drivers in Figure 5, which influence what infrastructure Scotland is likely to need in the next 30 years. We illustrate some of the impacts for infrastructure, demonstrating the importance of considering these drivers in any investment appraisal.

Our analysis includes understanding both what is important to Scotland as detailed in national policy, alongside broader trends and megatrends. It also builds upon targeted scenario modelling of a discrete group of variables.

Scenario work can help us consider a spectrum of futures, supporting risk management, as well as identifying opportunities. From our scenario work we identified some key messages, recognising challenges such as demographic changes that we are already dealing with, alongside the realities of how industrial change through the green revolution could drive added value for all of Scotland if harnessed. The scenario work also sheds a light on the role of consumers in driving infrastructure demand, whether that be consumption patterns, or the use of technology to support greater population distribution. These messages influenced and supported the driver analysis, contributing to a more nuanced understanding of driver impacts.

Our analysis concluded with a smaller grouping of essential drivers, discussed below. Many of these drivers are known with detailed recommendations to support decisions, such as climate change, while others are perhaps less explicitly discussed within the current policy narrative in Scotland, such as global security. The smaller group of drivers interact systemically and are most influential on infrastructure need. Further information on our analysis is detailed in the appendices and in particular, Appendix C.

Figure 5: Key drivers
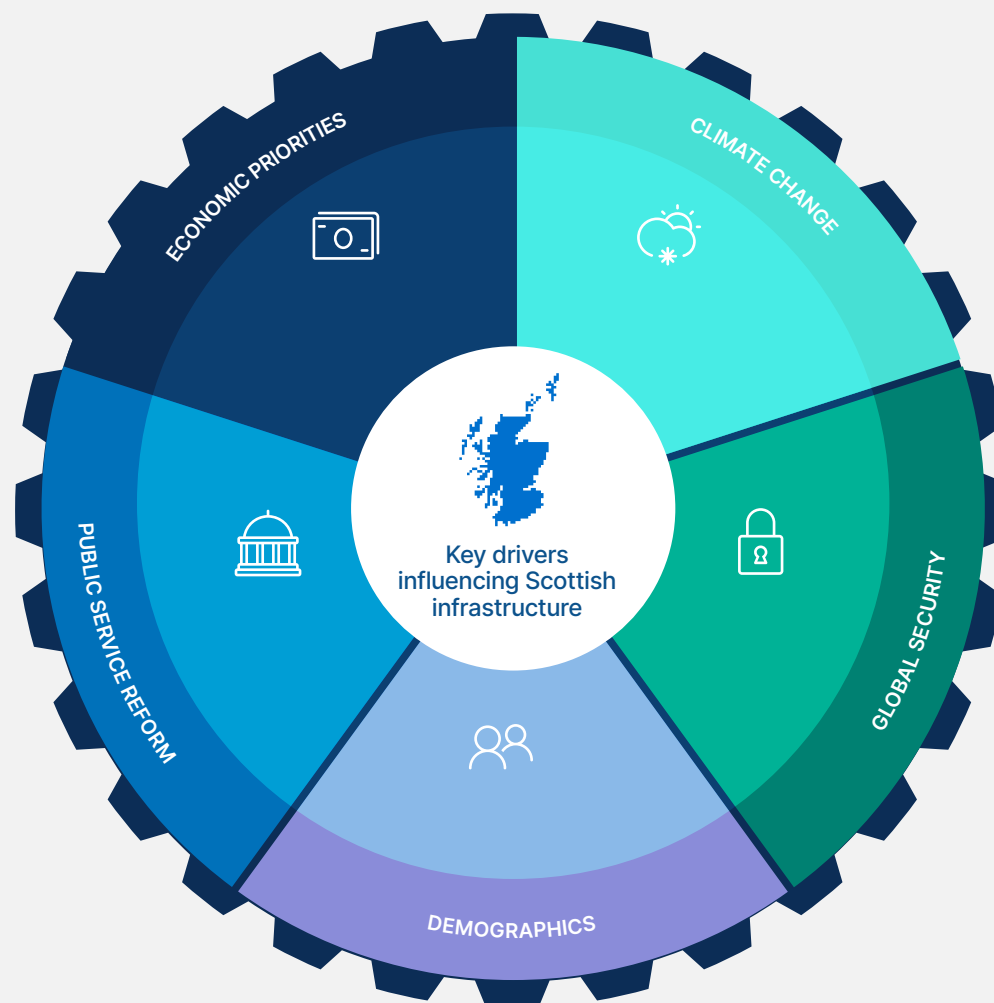
Demographics

The developed world has been forecast to age and decline for some time, as we live longer and family sizes are declining. Very recent projections for Scotland however have suggested an increase in population during the projection period to 2047, driven by migration, with the changing make up of different age groups still anticipated, particularly reducing number of children and increasing older age groups

This most recent information published by National Records of Scotland (NRS), uses census-based 2022 data and projects Scotland's population to grow by 4.4% between 2022-2032 and by 6.2% by mid-2047, with projected growth driven by migration. The NRS recognise the difficulties of long-term population projection however and assess eight alternate scenarios, with varying combinations of fertility, life expectancy and migration. Only one scenario shows a reduction in population by 2047. These projections contrast with the Office of National Statistics (ONS) 2020 Scotland data prepared for NRS which suggested Scotland's population would continue to increase until 2030 by less than half a percent, with a gradual decline from that point. By 2047 the population would have declined by just under 2% from the 2020 figure.

6.2%
Scotland's population is projected to increase by 6.2% between 2022-2047.

Scotland's 2022-based projections of a 6.2% increase is higher than the EU27 average projections of a 0.5% increase by 2050 on 2023 figures. However this varies by country, for example with a 44% increase in Malta and a decrease of 10% in Bulgaria.

Range of population growth projections in EU27

- 44%
- 6.2%
- -10%
- 0.5%

Legend:
- Highest: Malta
- Scotland
- Lowest: Bulgaria
- EU Average
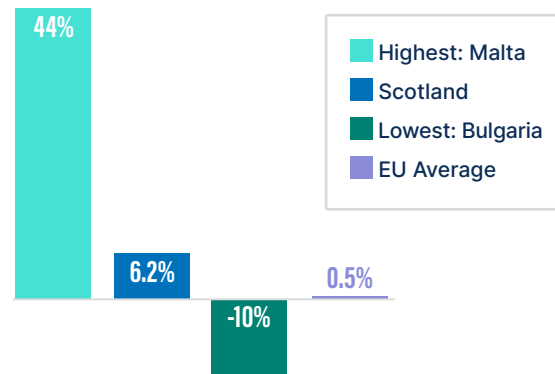
This variation across only two years' data illustrates the challenges of population projections, however in balancing the two datasets, NRS own narrative is useful, recognising that for the longer term,

"natural decline in the population could outweigh levels of migration by mid-2051, leading to the population starting to fall".

It is also worth noting that migration is the key factor in influencing population scale, however with 70% of the projected 2022 inward migration figure coming from beyond the UK, these are not levers Scotland controls. What skills this migration may bring to Scotland is also beyond the scope of this report.

The relationship between economic opportunities and the pull-factor for population retention has however often been a priority, particularly in rural areas. Yet, current analysis would suggest that demographic changes are likely to be broader than more rural communities alone.

While population scale and timing of changes can be debated, both data sets identify evolving patterns of age-groups, with increased numbers of older people and reduced numbers of children.

Drivers of Change

78%
Increase of 340,818 in those aged 75+.
An increase of 78%.

67%
Increase of 316,000 in those aged 75+.
An increase of 67%.

9%
Decrease of 79,856 in children aged 0-15.
A decline of 9%.

22%
Decrease of 193,610 in children aged 0-14.
A decline of 22%.

2%
Increase of 66,498 in working age population.
A 2% increase.

6%
Decrease of 229,491 in working age population.
A 6% decline.

■ 2022 NRS data   ■ 2020 ONS data
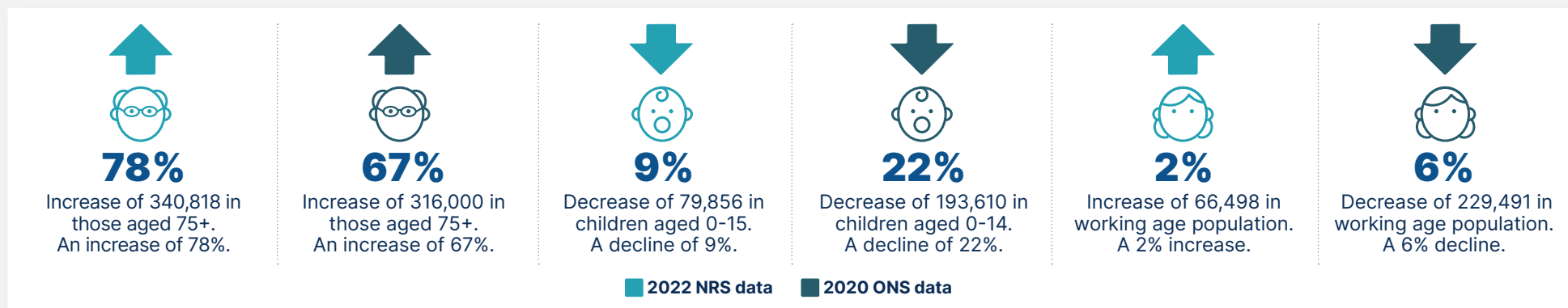
The scale of differences are perhaps not significant when we consider those aged over 75, however are more marked when we consider real term changes for both children and the working age group:

- 2022 NRS data suggests an increase of 340,818 aged 75 and over to mid-2047, from a 2022 baseline of 5.4 million. 2020 ONS data shows an increase of 316,000 to 2047, from a similar baseline.
- Both datasets show a decline in children, with 2022 NRS data projecting a decline of 79,856 for 0-15 year olds and 2020 ONS data showing a decline of 193,610 for 0-14 year olds. Note the slightly different age categories.
- 2022 NRS data shows an increase of 66,498 working age population (16-64) against 2020 ONS decline of 229,491. This is perhaps the most significant difference between the datasets.

The essential message is that Scotland is facing a changing demographic, particularly ageing but also some level of reducing numbers of children. The projections are inconclusive however whether we may need to also consider a reducing working age population, and overall population decline over the longer term.

Alongside population changes, the spatial distribution of population is a key driver of infrastructure need. Subnational population projections based on the same 2022 NRS data, illustrate the continued depopulation of some western local authority areas, alongside an increase in primarily eastern authority areas, as well as the continued urbanisation of Scotland, particularly the central belt. Projections to 2032 show Midlothian increasing the most by 14.7% whereas Inverclyde has the largest decrease of 5.4%. Eight of the thirty-two authorities are showing a decline of 0.5-5.4%, four remaining the same, and twenty increasing from between c0.1-15%. These projections are more favourable than 2018 projections, with fewer council areas experiencing population decline.

Similar to the more recent national data, changes are being driven primarily by migration, with only natural growth in five out of Scotland's 32 local authorities. These are fairly short-term projections, however demonstrate a significant change in settlement, that do not simplistically align along rural/urban lines, e.g. Highland Council is projecting population growth, although below the projected national average. As noted, migration has a role in population scale and equally has an impact on spatial distribution.

Combined, these demographic shifts have far-reaching implications, including what infrastructure we may prioritise and where.

Infrastructure decision-making therefore needs to consider the projected spatial distribution and age-profile of our population to effectively plan for the long-term. Recognising the challenges of projections, there may be value in considering a narrow spectrum of possible futures, within recent ONS and NRS analysis.

Drivers of Change

⚖️ Opportunities and challenges

There are some sectoral infrastructure impacts these demographic shifts are likely to influence. Shorter-term population increases will put greater demand on all infrastructure, requiring clear management of public services and access to those services. In most areas there will however be declining demand for early years and school education with declining births.

In contrast, services will need to consider the ageing population, whether that be health and care demand which is likely to rise, or changes in the prison population which continues to see the average age of those in prison rising. Transport modalities will likely need to be more mindful of accessibility for an older population.

Spatial distribution, including increased population in some areas, will impact on a range of services and assets, across economic, social and natural infrastructure, requiring investment. Utilities such as water, are already seeing increased demand in the east of the country. As this is an area also experiencing climate related drought, the increased demand on water creates a further challenge.

This increased population is putting some local authorities under pressure and will continue to increase demand for a range of infrastructure types including housing.

In addition, spatial distribution changes impact on the wellbeing of some communities projected in contrast to lose people, undermining the viability of places including creating challenges for public services and assets.

There are several considerations for the delivery of public services in adapting to demographic changes. The public service reform agenda which we consider next, needs to consider these possible impacts in planning for a future-proofed delivery model, and related infrastructure. In addressing the spatial impacts, policymakers will need to consider the trade-offs to either address or manage population-driven changes, recognising the costs to communities of unmanaged decline, as well as the management of public services where there is reduced demand. This can be offset by investment in communities to retain a viable population and services that support wellbeing, however this requires a clear strategy and supporting action.

🔍 KEY MESSAGE

Long-term demographic trends of the changing population and the movement of people must be factored into investment decision-making. With limited resources, trade-offs in addressing the impacts of changing distribution of population, including through targeted investment to manage population decline in some areas, versus managing the housing, social and economic infrastructure pressures created by population expansion, will need to be addressed, supported by appropriate community engagement.

Drivers of Change

Public service reform

Public service reform has been a priority since the 2011 Christie Commission, with this focus recently reinforced in the 2025 Reform Strategy.

The need for reform is driven by a number of challenges, including workforce costs, with the larger public sector workforce in Scotland compared to England and higher hourly pay compared to the rest of the UK, having risen since 2019. This is exacerbated by pressures in some key areas such as health, forecast to further increase with existing delivery models and demands of an ageing population; increasingly complex socio-economic challenges requiring a whole-system approach; and despite significant investment, a reduction in public satisfaction with services.

Reforming the public sector is seen by many commentators as a priority, with a focus on prevention, joined-up and efficient services, changing the infrastructure we need

> ### ⊘ KEY MESSAGE
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> Every significant investment in a piece of social infrastructure represents an opportunity to shape service delivery to drive reform, and also locks in aspects of delivery in a community for generations. Every decision should be made with long-term cross-public service reform and placemaking for sustainable public services and communities in mind.

⚖ Opportunities and challenges

Public service reform is likely to continue to impact across infrastructure assets which support public services. This includes education, health and social care and prison estate, water and waste-water infrastructure and emergency services' assets. In recent years, reform has focused more on efficiency and starting the process of joining up services, with infrastructure a key aspect of that agenda. This has included reducing the size of the public estate through focusing on shared services and the Single Scottish Estate programme. With an office estate of approximately 370 buildings measuring floorspace of c. 570,000sqm and estimated annual operating costs of c. £72m this is a significant opportunity. A previous programme to increase collaboration and co-location between 2014-2018 delivered annual recurring revenue savings of over £28m.

Additionally, many public services are already being redesigned to support the demographic and cost challenges being seen, whether that be a move to more prevention and primary healthcare to minimise downstream poor health and quality of life; or use of technology to deliver some services to ensure equity and efficiency of access. These changes are likely to see continued sharing of public buildings, with greater integration of services, as well as an increased role for technology, supported by ubiquitous telecoms access.

The ambition of public service reform is detailed in policy, however it is perhaps important to highlight the role of infrastructure to support other ambitions such as place-making. As such, as we progress public service reform priorities, considering wider policy priorities would be beneficial, to minimise disbenefits. For example, the availability of schools, health centres, parks, accessibility and other public assets are pull factors for places. The decline in heavy industry from the post-war period into the 1980s changed the identity and landscape of much of industrial Scotland, with far-reaching impacts to this day. This was further exacerbated by the impact of some decisions, such as out-of-town retail developments, further undermining high-street retail and commerce, and the unforeseen rise in internet shopping. Many of our communities that relied on historical industries continue to face poor wellbeing outcomes, as defined through the Scottish Index of Multiple Deprivation. A 2021 study suggests over a third of the population of Great Britain live in "older industrial Britain".

> Where there is a dearth of valued infrastructure, public infrastructure and essential services can have a role to drive change.

Managing the place aspect of public service reform needs to be carefully included in decisions, balancing the drivers of change with public infrastructure's role in place making.

Drivers of Change

Climate change

The evidence for climate change is overwhelming. Scottish Government policy combines mitigation with the opportunities of a green transition and the necessity of adaptation is supported by plans, legislation and related emission reduction targets.

Plans include a new Climate Change Plan 2026-2040 in November 2025, built upon previous plans primarily focused on mitigation, while the 2024-29 Adaptation Plan known as SNAP3, identifies investment priorities and approaches to address the negative impacts of climate change.

The third component of climate change is ensuring a Just Transition for all of society, with the last annual report published in 2024.

2-4%
reduction in global output by 2050 due to a 2°C increase

This policy response reflects the scale of climate impacts expected and being seen in risks such as flood, high-heat forest fires and water scarcity, as well as the impact of increasing temperatures on infrastructure such as buildings and roads. These changes also create an economic challenge, with EU27 research showing a 7% reduction in GDP by 2050, due to a temperature increase above 1.5°C, with specific areas such as food prices rising by 20%. Other research illustrates how different temperature rises could impact on economic growth through a mix of physical impacts, environmental policies and green investment including adaptation. Impacts varied by country, however global output was reduced by 2-4% by 2050 due to a 2°C increase but closer to 10% at above 3°C.

Alongside this gloomy picture, implementation of ambitions continues to be weaker than anticipated, with the Climate Change Commission's 2023 progress report for Scotland highlighting a number of infrastructure sectors as requiring particular attention to address missed targets. Similarly the Just Transition Commission's 2024 annual report noted concerns on Scotland's progress.

Scottish Government's own monitoring report published this year, notes more recent progress, including emissions falling in all sectors except International Aviation and Shipping. The measures laid out in the updated 2026-2040 Climate Change Plan also seek to address implementation challenges. Equally, the Climate Change Commission (CCC) UK level report

for 2025 which does not provide up to date Scottish emission data, however notes that reductions have primarily been in reserved sectors such as electricity and fuel supply and industry. Nevertheless, Scotland continues to lead the UK in emission reductions relative to 1990 levels. The CCC proposes that broadening decarbonisation successes to include more devolved areas will be essential.

Implementing mitigation and adaptation commitments is an essential ingredient of addressing climate challenges, with infrastructure having a significant role in this system of interconnected assets to support ambitions.

⚖️ Opportunities and challenges

Infrastructure has a key role in adaptation and mitigation efforts for climate change, well documented and committed to across the Scottish policy landscape. For example, infrastructure adaptation priorities from the 2024-29 Adaptation Plan emphasise the risks and opportunities of nature and nature-based solutions; alongside making buildings including non-residential buildings fit for a changing climate; and a focus on sectors such as water, transport and the energy system as areas affected by climate vulnerabilities.

The Climate Change Commission's 2023 progress report for Scotland highlighted a number of similar infrastructure sectors as requiring particular attention to address missed emission reduction targets, including: buildings and domestic heat pump installations; new woodland creation and peatland restoration; recycling of waste from all sources, and to a small degree onshore wind production. As noted above, the Climate Change Commission UK level report for 2025 proposes that broadening decarbonisation successes to include more devolved areas will be essential.

Other areas were encouraged to maintain positive momentum, such as: electric vehicle charging; reducing car demand; aviation decarbonisation; shipping emission reduction; energy efficiency in non-residential buildings; mitigation measures supported by farmers and land managers, and forestation. Policies and implementation transparency were highlighted, emphasising the need for action plans to drive implementation of policies and strategy. As noted above, both the updated Scottish Government Climate Change Plan and the 2025 Progress report identify actions to mitigate for implementation weaknesses and further reduce emissions.

Several of the policies identified in our analysis emphasise the importance of behaviour change to address climate risks, whether that be in reducing water consumption or addressing waste production. These considerations are very relevant in taking a system approach and would impact on infrastructure need. This system approach is also essential in ensuring we remove barriers to delivery of our ambitions and minimise disbenefits.

For example, the standards for social housing are stringent, with all social homes requiring a band B energy performance certificate by 2032, a mitigation measure. This is cited as creating wider system challenges, particularly financial, such as the ability for social landlords to sustain fair rents. With sometimes competing policy priorities we need to understand what impact climate plans and legislation are driving, in order to support effective investment decisions.

Addressing this system approach requires climate mitigation and adaptation to be fully integrated into asset management plans, planning infrastructure on a place-basis and not the individual system or asset in isolation. It requires a life-cycle approach, to minimise the costs of adapting and mitigating for climate change, recognising the significance of climate impacts on our infrastructure and services.

Climate change is a megatrend that will likely impact on how our infrastructure is developed and protected for generations. It illustrates the system model of policy and should continue to be central to our decision-making assessment for infrastructure, whether maintenance, retrofit or new build.

Drivers of Change

🔽 KEY MESSAGE

Mitigating climate change through the progress to net zero, and adapting infrastructure for resilience to its inevitable impacts, are the challenge of this generation. A cross-system approach is needed with every investment and disinvestment decision mainstreaming mitigation and adaptation considerations. Increased place-based planning and behaviour change should be more fully integrated to align with necessary investment.

Eddleston Water Restoration

River and floodplain restoration to reduce flood risk and enhance biodiversity.

LOCATION: Scottish Borders

STATUS: Current ●

🌱 **NATURE POSITIVE**

The Eddleston Water project is a long-term, nature-based restoration of a heavily modified tributary of the River Tweed and its 70km² catchment in the Scottish Borders.

Led by the Tweed Forum with government, academic and community partners, it aims to reduce downstream flood risk, restore natural river processes and enhance biodiversity. Works include re-meandering over three kilometres of channel, installing 135 high-low log restrictors, creating 41 flood ponds and planting more than 220 hectares of native woodland.

Monitoring shows reduced peak water levels and delayed flood peaks, alongside improved habitats. Funded largely by the Scottish Government, it operates as a "living laboratory" to inform policy and practise.

Drivers of Change

Driving economic priorities

Economic success is a key driver for most countries, generating value and supporting jobs, which facilitates investment in a range of services and assets valued by the population.

While there are areas where our understanding of the role of infrastructure needs improved, such as its role to drive inclusive growth, infrastructure has a place to support our economic priorities through direct sectoral investment as well as developing investor confidence by ensuring the quality and availability of essential infrastructure such as transport, telecoms and housing.

However, as with all modern economies, Scotland sits within a global system of trade and investment. This means assets that support the economy may not always be in public hands and are often influenced by a supply chain and competition both within Scotland as well as internationally. Additionally, Scotland does not always have the levers to drive change, where policies are reserved to the UK Government.

Within this interdependent system, priorities can often be difficult to influence, with the public sector seeking to create the conditions for private sector activity and investment, including in some cases direct public investment to address private investment barriers. Equally investment can be targeted to mitigate for and even address negative impacts of economic changes, such as in our communities facing historical disadvantages. This balance requires a clear understanding of the global system for many sectors along with the benefits of intervention.

Where matters are reserved to the UK, collaboration is needed, to ensure Scotland can drive its economic priorities. As with all public investment, recognising and documenting trade-offs including disbenefits, should be part of prioritising investment intended to create growth.

Drivers of Change

⚖️ Opportunities and challenges

Key areas of infrastructure influence are both direct sectoral investments to support priority sectors drive employment and socio-economic impacts; as well as leveraging growth by public investment in enabling infrastructure such as connectivity or utilities, and social infrastructure such as housing to facilitate spatial development.

Scotland's 2022 National Strategy for Economic Transformation (NSET) and the Green Industrial Strategy published in 2024, align around the ambition for a fair distribution of economic growth and exploiting the opportunities of a green energy transition. Both strategies identify new and emerging sectors including wind, carbon-capture utilisation and storage, hydrogen, and clean energy-intensive industries of the future including emerging technologies.

A foundation to much of the new market priorities is the role of natural assets. This significant asset is seen to provide an opportunity for the development of an investment market that sensitively trades upon the wealth of Scotland's natural capital. Similarly, the waste sector is another area for development, where the opportunities for a more integrated market are often limited by the global market for waste products. These areas require significant public sector focus to remove barriers to delivery and exploit opportunities for the benefit of Scotland.

This green transition is also emphasised in Scotland's spatial plan, the National Planning Framework 4, which identifies 18 national developments as significant developments of national importance. Of the 18, many support the ambitions of Scotland's economic strategy and the green energy transition.

While a national economic priority, the green energy transition has a number of challenges including upgrades to the transmission and distribution network. As a reserved matter, this challenge requires direct engagement with timely solutions to ensure ambitions are met.

Alongside new markets NSET reinforces the importance of existing strong sectors such as digital technology, food and drink, life sciences, creative industries and tourism. These include many service sectors, which in 2019 GDP statistics identified as over three quarters of the Scottish economy.

75%
Service sector represents three quarters of the Scottish economy

Drivers of Change

8%
decline in
construction jobs
between 2014-2024

4.5%
projected
construction job
growth 2027-2034

The construction sector is vitally important in all this as it will be directly engaged in delivering most of the infrastructure work needed. Capacity and capability challenges have been identified, with a construction sector action plan (refreshed 2025) published by the Construction Leadership Forum, addressing some of the challenges, including creating a current and future workforce that have the skills needed. The ageing workforce is resulting in people leaving the sector, necessitating replacement of workers. Skills Development Scotland sectoral skills assessment in 2024 showed a decline in jobs in the sector of just under 8% between 2014 and 2024, however anticipate greater job growth in the long-term (2027-34) than the rest of the country (4.5% v 1.2%).

As with many of the key drivers in this section, the spatial component is an important consideration, both to support place development but also to minimise negative impacts of economic development on vulnerable communities and places. However, it is likely that some of the investments needed to de-risk private sector investments should be those traditionally emphasised, such as social infrastructure in the right places and connectivity for priority places. As with all of our messages in this Needs Assessment, it is clear we cannot do everything and instead need to prioritise based on impact while mitigating for disbenefits as appropriate. In driving growth, including using infrastructure to support investment, we should reflect on these interactions and plan accordingly.

KEY MESSAGE

The public sector has a key enabling role to create the conditions for private investment across economic infrastructure sectors. As a regulator it should carefully balance investability, policy ambitions and consumer protection and as a co-investor it can catalyse innovation and growth in emerging sectors, as well as mitigating market failures especially in rural areas. Using these powers effectively will require strong cooperation between UK, Scottish and Local governments.

Public sector infrastructure is also critical for economic development, supporting housing, public services and connectivity in areas of increased activity whilst managing trade-offs and promoting a just transition by supporting vulnerable workers and communities.

Across all infrastructure sectors, the central role of the construction and related industries must be recognised, with co-ordinated actions to deliver the pipeline and support the skills that it will require.

Drivers of Change

Global security

We are in an increasingly uncertain time, with a global tendency towards a more transactional approach to collaboration with international partners, alongside continued conflicts and concerns of hostile states undermining both physical and cyber security.

The UK Government National Security Strategy 2025: Security for the British People in a Dangerous World acknowledges these changes and has established a three-part strategy to create national resilience, covering both defence but also resilience of systems such as food, water and energy. Scottish Government's Future Trends for Scotland work also highlights these geopolitical and food security challenges, alongside cyber threats to individuals and organisations, in a world where we increasingly rely on online platforms and services. This trend analysis demonstrates a clear recognition of the areas, including infrastructure that require an appropriate focus within this time of uncertainty.

It is noted that in other parts of Europe, government-led infrastructure spending is currently being deployed to enhance resilience against natural and man-made risks, across critical infrastructure, including energy systems, utilities, food distribution, transport, finance and banking, space and public administration.

⚖️ Opportunities and challenges

The UK Government's strategy includes several infrastructure areas such as defence (border security, national defence and cyber security), energy, telecoms, food and water. These cover both reserved and devolved policy areas, with both UK and Scottish governments having a role to drive effective decision making, using the levers available to them.

Commitments to increase medium-term defence spending may see investment in Scotland's military infrastructure, with the potential for wider supply chain opportunities. Alongside this, Scotland has the levers to promote water resilience, through Scottish Water as well as food resilience through land use decisions and both guidance and, where appropriate, support to the agriculture sector. The Scottish Cyber Coordination Centre established by Scottish Government in 2022, supports the public sector in incident and vulnerability management, threat intelligence sharing, cyber exercising to test response to incidents, and cyber assurance, essential as services become increasingly digitalised.

UK and Scottish governments collectively can ensure the reserved areas of energy and telecoms are developed and strengthened not only for economic and social priorities such as equity, but also defence and resilience needs. However, integrating the economic and social priorities of these areas with national security and resilience requires an acknowledgement of this priority, with a reflection on competing issues such as climate change in the agriculture sector, and supported by a clear action plan to enable the strategic ambition of a secure Scotland and UK. The EU approach may provide a model to help direct action.

Drivers of Change

⬎ KEY MESSAGE

Physical and cyber security is an important consideration across all infrastructure systems. In an increasingly uncertain world, securing infrastructure and related systems from cyber attack is an increasing task. More broadly, working with UK Government there is an opportunity to consider the contribution that defence and security infrastructure can make in Scotland, and to develop and strengthen critical infrastructure against both natural and man-made risks. The EU approach may provide a model to support action.

04
Scotland's Infrastructure

Scotland's
Infrastructure

Scotland's infrastructure

A strong foundation

The identified drivers of change present a system-wide understanding of what we need to respond to over the longer-term in the form of challenges, as well as guiding on opportunities to maximise impacts for the people of Scotland. In Appendix B we have established a bottom-up review of our infrastructure sectors, within the categories of **economic**, **social** and **natural infrastructure**.

Economic infrastructure

Economic infrastructure refers to the physical and technical facilities that underpin the economy, including transport networks, energy systems, waste management facilities, water and wastewater facilities as well as telecommunications and digital infrastructure.

Social infrastructure

Social infrastructure is the fabric of communities and houses public services. It includes housing, education facilities, healthcare facilities and care homes, emergency services, defence, justice infrastructure as well as cultural and recreational facilities.

Natural infrastructure

Natural infrastructure is the network of natural or nature-based systems and features that are strategically conserved, restored, designed or managed to deliver services and benefits to society, the economy and the environment by using, enhancing or emulating ecological processes. It includes both green and blue assets and may operate alongside, or as an alternative to, built infrastructure.

Scotland's Infrastructure

Appendix B provides a baseline of the sectors captured within these categories, using available evidence including distribution of assets. While we have included all assets captured by our definition of infrastructure for public, private and third sector, the availability of data means some sectors are more effectively reviewed than others. Natural infrastructure in particular is an area for development. Finally, it is also a point in time, recognising that data continues to be updated and strategy developed.

This baseline is not however an assessment of individual asset quality beyond a review of the

opportunities and challenges each sector is facing. It is hoped that asset strategies being further enhanced through leadership by the Scottish Government will support a more comprehensive assessment of quality against need in the future. This baseline includes understanding the policy, strategy and governance directing those assets and how they have evolved in the last 20 years.

In this section therefore we have drawn out a summary of the sectors, alongside a focus on the opportunities and challenges both emerging and likely to be faced over the next 30 years.

80%
of current infrastructure systems will still be in use in 2050

We also note how the drivers we have identified may further influence these sectors over the longer-term, including specific areas for consideration in each sector. Finally, at the end of this section we highlight some system reflections when we review the sectors collectively.

This bottom-up analysis demonstrates that we are starting from a strong position, both in the infrastructure that already exists in Scotland, but also in the drive to improve our infrastructure to maximise its benefits for now and the future. We do however have some key challenges, particularly around an ageing public service estate, with backlog maintenance a significant issue. A 2019 Scottish Parliament study noted that 80% of our current systems will likely still be in use in 2050, reinforcing the importance of considering how our existing assets continue to be sustained, to be fit for purpose. The National Engineering Policy Centre's recently published report Reviving our Ageing Infrastructure provides valuable context and further guidance.

Before reviewing our infrastructure sectors individually, it is also important to reflect on the current ownership and funding models for infrastructure in Scotland. This ownership and funding is complex, primarily involving the public and private sector, and funded either by consumers in the form of user/occupier/developer charges, or public sector budgets via taxation. This impacts on the governance and therefore levers available in addressing sectoral opportunities and mitigating for challenges, some of which we will touch upon in our review. Table 1 summarises this picture.

Table 1: Infrastructure ownership and funding

ASSET	CATEGORY	OWNERSHIP	FUNDING
TRANSPORT	Roads	Public – Scottish Government/Local Authority	Tax
	Rail	Public – Scottish Government	Tax/Consumer
	Airports (major)	Private	Consumer (regulated)
	Airport (lifeline)	Public – Scottish Government/Local Authority	Tax/Consumer
	Ports & harbours	Private/Public – Local Authority	Consumer
	Canals	Public – Scottish Government	Tax/Consumer
ENERGY	Electricity – generation	Private	Consumer (regulated)
	Electricity – transmission & distribution	Private	Consumer (regulated)
	Electricity – storage	Private	Consumer (emerging regulation)
	Gas – extraction	Private (under licence)	Consumer (regulated)
	Gas – storage & distribution	Private	Consumer (regulated)
	Oil & derivatives – extraction	Private	Consumer
	Oil & derivatives – storage & distribution	Private	Consumer
	Heat networks	Public – Local Authority/Private	Consumer
WASTE		Public – Local Authority	Tax
WATER (incl. flood management)	Water	Public – Scottish Government	Tax/Consumer (regulated)
	Flood management	Public – Local Authority	Tax

Scotland's Infrastructure

ASSET	CATEGORY	OWNERSHIP	FUNDING
TELECOMS	Mobile	Private	Consumer (regulated)
	Fixed	Private	Consumer (regulated)
HOUSING	Affordable – social	Public – Local Authority/Private/Charitable	Tax/Consumer
	Affordable – mid-market	Public – Local Authority/Private/Charitable	Tax/Consumer
	Market	Private	Consumer
HEALTH AND SOCIAL CARE	Primary	Public – Scottish Government/Private	Tax/Consumer
	Acute	Public – Scottish Government/Private	Tax
	Social care	Private/Public – Local Authority	Tax/Consumer
EDUCATION	Early years	Public – Local Authority/Private	Tax/Consumer
	Schools	Public – Local Authority/Private	Tax/Consumer
	Colleges	Public – Scottish Government	Tax
	Universities	Private	Tax/Consumer
EMERGENCY SERVICES	Police Scotland	Public – Scottish Government	Tax
	Fire & Rescue Services	Public – Scottish Government	Tax
	Scottish Ambulance Service	Public – Scottish Government	Tax
DEFENCE		Public – UK Government	Tax
JUSTICE	Courts & prisons	Public – Scottish Government	Tax
CULTURE & RECREATION	Culture	Public – Scottish Government/Local Authority/Charitable	Tax
	Sport & leisure	Private/Public – Local Authority/Charitable	Tax/Consumer
NATURAL	Parks – urban	Public – Local Authority/Charitable	Tax
	Parks – rural	Private/Public – Scottish Government/Charitable	Tax
	Forestry	Private/Public – Scottish Government/Charitable	Consumer
	Agriculture	Private	Consumer
	Peatland	Private/Public – Scottish Government	Tax/Consumer
	Blue	Public – Scottish Government/Private/Charitable	Tax/Consumer
ADMINISTRATION		Public – Scottish Government/Local Authority	Tax

Scotland's Infrastructure

Economic infrastructure

Transport

Transport infrastructure supports our ability to move around the country for work and leisure. Scottish Government, and its agency Transport Scotland, oversees the development and delivery of national transport policies.

This includes supporting and collaborating with other connectivity providers and sponsor bodies, encompassing the public and private sector. Transport Scotland's current priorities, detailed within the National Transport Strategy 2 include reducing inequalities; taking climate action; helping deliver inclusive growth; and improving health and wellbeing.

£4bn
The transport sector accounts for c. 7% of the 2025/26 Scottish budget

7%
of total budget
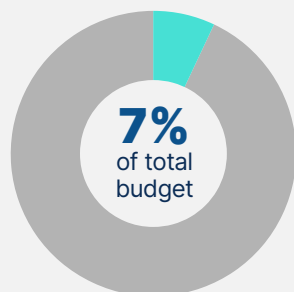
Transport Scotland manages Scotland's trunk road and motorway network, oversees rail and ferry services, works with airlines and airports on sustainable aviation, and administers concessionary travel programmes and bus service grants. It also collaborates with the UK Government to address the impact of reserved policies and changes in UK legislation. The

agency's asset base was valued at £28.4 billion in 2023-24, primarily reflecting the trunk road network. The transport sector accounts for £4 billion of the 2025/26 Scottish Government budget, which is approximately 7% of the overall budget and facilitates significant investment in public transport, trunk roads, ferries, and sustainable travel. The transport sector safety and improvement measures are supported by a substantial regime of regulation.

Roads are crucial to Scotland's transport provision, including supporting the resilience of our rural areas. Scotland has over 57,000km of roads, with the trunk road network comprising just 7% of this but handling 40% of total distance travelled. The trunk roads are managed by Transport Scotland, while local authorities who are responsible for local transport strategies maintain the significant local road network.

48bn
vehicle km travelled in 2023, a 2% increase from 2022

Road traffic volumes have risen steadily, with 48 billion vehicle kilometres travelled in 2023, representing a 2% increase from 2022. Cars account for the majority of traffic, but light goods vehicle traffic has grown significantly due to

factors like e-commerce, while bus traffic has declined. Scotland's draft Climate Change Plan 2026-2040 includes ambitious goals to reduce car miles by 16% by 2030, though these targets are being revised to align with the 2045 net-zero goal. This document emphasises behaviour change incentives and energy transition as key supports to reduce road emissions. Low Emission Zones have been introduced in Glasgow, Dundee, Aberdeen, and Edinburgh, with enforcement since mid-2024.

Active travel, encompassing walking, wheeling, and cycling, is central to Scotland's efforts to reduce emissions and promote healthier, more sustainable communities. The National Cycle Network (NCN), developed by Walk Wheel Cycle Trust (formerly Sustrans), spans 2,607 kilometres, with almost 1,126 kilometres traffic-free. Nearly

half of Scotland's population live within one kilometre of a route. Scotland also boasts over 21,000km of core paths, providing extensive walking and cycling opportunities.

> Investments in active travel infrastructure aim to ensure walking and cycling become the preferred options for shorter journeys by 2030, aligning with the vision of people-centred communities.

Bus travel is a key mode of transport in Scotland, yet has seen a 31% decline in passenger numbers from the 2007-08 peak. There have been small fluctuations over this period, including a 13% increase in 2023-24 on previous years, with 334 million passenger journeys undertaken. Over half of these journeys were made under the National Concessionary Travel Scheme. However, bus fleets, primarily delivered privately, have reduced, and industry employment has dropped in recent years. In contrast, rail travel has been on the rise, recovering from the pandemic with a 27% increase in passenger journeys on ScotRail services in 2023-24 compared to the previous year, though still below pre-pandemic levels. Scotland's rail network spanned 2,708 kilometres

31%
Bus travel has declined by 31% from the 2007/8 peak

27%
Increase in rail journeys in 2023/4 compared to previous year

in 2022-23, with 362 stations, and has seen significant investment in electrification and new infrastructure. Freight rail also plays a role, with 4 million tonnes of goods lifted in 2023-24.

8m
In 2023, 8 million passengers used ferry services, a 5% increase from 2022

Light rail systems, such as the publicly operated Edinburgh Trams and Glasgow Subway, have also shown growth. Edinburgh Trams, which extended its route to Newhaven in 2023, saw passenger journeys increase to 10.1 million in 2024. Glasgow Subway, one of the oldest in the world, recorded 13.4 million journeys in 2024, exceeding pre-pandemic levels. Both systems are benefiting from modernisation and expansion projects.

Air travel remains a vital part of Scotland's transport system, particularly for connecting remote communities and supporting the economy. Scotland's airports handled 26 million passengers in 2023, a 21% increase from the previous year but below the pre-pandemic peak. While Edinburgh, Glasgow and Aberdeen airports are all under private ownership, Scottish Government owns and operates Highlands and Islands Airports Limited, which manages 11 regional airports, and Glasgow Prestwick Airport, with plans to return the latter to private ownership. Freight transported by air remains minimal but may grow due to changes in trade and the development of drone technology.

Ferries are essential for connecting Scotland's islands and coastal communities. In 2023,

8 million passengers used ferry services, a 5% increase from 2022. Public body, Caledonian MacBrayne is Scotland's largest ferry operator, accounting for 63% of passengers. Ports also play a vital role in Scotland's trade and economy, handling 55 million tonnes of freight in 2023. Ownership encompasses privately owned ports, local authority ports and harbour and trust ports. Major ports, such as Grangemouth, Clydeport, and Aberdeen, are critical hubs, with Green Freeports in the Firth of Forth and Inverness & Cromarty Firth focusing on net-zero investments and economic growth.

Scotland's canal network, managed by the public body Scottish Canals, spans 226 kilometres and serves as a unique asset for tourism, leisure, and limited cargo transport. The canals are Scheduled Ancient Monuments, attracting an estimated 22 million visitors annually. They also play a role in transporting materials, such as timber through Ardrishaig Harbour on the Crinan Canal.

The transport sector has seen significant investments over the past 20 years, including new rail infrastructure, the Queensferry Crossing, active travel projects, upgraded ferry terminals and investment in new vessels. However, as we will see it faces some challenges, particularly in the priority to decarbonise and adapt to climate change, while ensuring improved connectivity to support Scotland's economy and communities.

22m
Scotland's canal network attracts 22 million visitors annually

Scotland's Infrastructure

⚖️ Opportunities and challenges
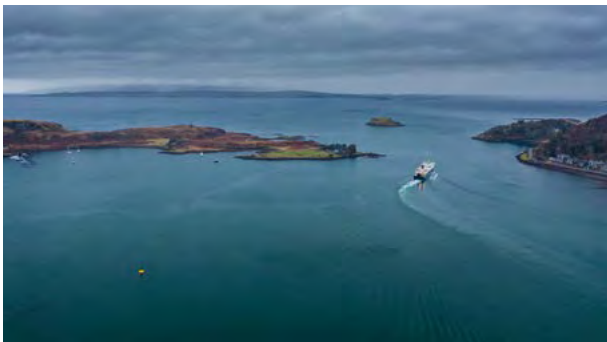
Scotland's transport sector faces a range of challenges spanning funding, service provision, climate goals, and socio-economic issues, but there are also numerous opportunities for progress. As with most aspects of public investment, limited funding must increasingly accommodate demands across various modes of transport. Further, system challenges such as integration of modes of transport and reliability also require to be managed, with variable connections, timetable mismatches, and limited evening and weekend services creating barriers to seamless travel. This is also layered by socio-economic barriers such as transport poverty, with limited access options, social isolation and the accessibility needs of vulnerable groups and communities, including

23%

🚗

Surface transport is Scotland's highest emitting sector, contributing 23% of emissions in 2022

the challenge of regional inequalities.

If Net Zero targets are to be met, significant changes are required, with surface transport remaining Scotland's highest-emitting sector, contributing 23% of emissions in 2022. This is 7% below 2019 levels, primarily due to sustained shifts in travel patterns and home working post the Covid-19 pandemic. Emissions are dominated by the persistence of high car dependency, accounting for almost 75% of traffic volume in 2023, while light goods vehicles rose significantly to 20% of volume.

> Decarbonisation is an urgent issue, requiring significant innovation and investment.

Alongside the challenge of reducing emissions, the transport system must also be adapted to withstand the impacts of climate change, ensuring greater resilience to extreme weather events.

Despite these challenges, there are significant opportunities to transform Scotland's transport system. Advances in data and technology, such as the adoption of ultra-low and zero emission vehicles and integrated customer-facing transport systems simplifying multi-modal public transport, offer potential for sustainable travel behaviours and support net-zero goals. The increasing use of rail services presents an opportunity to build on recent trends, while better integration of transport with spatial

planning and wider infrastructure policies, such as the energy transition, could unlock greater benefits. Improved asset management, supported by digital tools and data-driven decision-making, has the potential to enhance the efficiency and resilience of the transport network.

> Putting our places at the heart of decisions, by prioritising investments that deliver localised benefits, could strengthen outcomes for communities, ensuring transport projects align with broader social and environmental goals.

There is also significant scope to improve sustainable access to services such as health and social care, benefiting patients, staff and visitors. On an economic level, enhanced international transport links can boost Scotland's competitiveness and productivity, while investment in low and zero-carbon transport and active travel infrastructure can support sustainable tourism.

The balancing of transport priorities and investment is not easy, however by addressing these challenges and seizing opportunities, Scotland's transport system can continue to evolve to be more inclusive, sustainable, and resilient, while contributing to the nation's economic growth and environmental objectives.

Scotland's Infrastructure

Key drivers

In the context of our identified drivers from Section 3, transport is influenced by most of these and will therefore need to consider several anticipated changes:

Demographics

Scotland's changing demographics, particularly an ageing population, will place increasing demands on transport systems to be accessible, inclusive, and responsive to the needs of older people and those with mobility challenges. Public transport, in particular, will need to adapt by improving accessibility, ensuring affordability, and maintaining reliability for those who may become more dependent on shared or public modes of travel. At the same time, urbanisation trends may lead to concentrated demand for transport services in cities, while rural and remote areas could face further service reductions, exacerbating inequalities in access. Conversely, shifting working patterns, such as remote and hybrid working, may reduce commuter traffic but create new demands for localised, flexible transport options. The sector will need to balance supporting an increasingly diverse population with addressing regional disparities and maintaining services in an efficient, affordable and accessible way.

Public service reform

The public sector's evolving role will require innovative approaches to transport funding and service delivery. With public budgets under pressure, innovative approaches to financing and delivery will continually need to be considered along with alternative funding mechanisms, such as road pricing or congestion charges. This will also need to align with UK Government funding, reflecting reserved transport taxation such as Vehicle Excise Duty and Fuel Duty. Local authorities, regional transport partnerships, and national agencies will need to work collaboratively to integrate transport and infrastructure planning, ensuring that transport systems are aligned with broader public sector priorities, such as health, education, and housing. Digitalisation across the private and public sector will also play a key role, enabling better data sharing, real-time monitoring, and enhanced decision-making to improve service delivery and user experience.

Climate change

Climate change will be one of the most significant drivers of transformation in the transport sector, as Scotland seeks to meet its net-zero emissions target by 2045. Decarbonising the sector will require a rapid transition to sustainable modes of transport, including widespread adoption of ultra-low and zero emission vehicles, electrification of rail and bus networks, and investment in active travel infrastructure. Road freight transport will need to shift to ultra-low and zero-emission technologies, likely through battery electric power. Climate resilience will also be critical, as Scotland's transport infrastructure faces increasing risks from extreme weather events, including flooding, landslides, and coastal erosion. Behavioural change campaigns to reduce car dependency and promote sustainable travel choices will also be key to achieving climate goals, requiring sustained government-led initiatives and public buy-in.

Scotland's Infrastructure

Economic priorities

Transport will remain a cornerstone of Scotland's economic development, supporting connectivity, trade, and productivity. Over the next 30 years, the sector will need to adapt to changing economic priorities, including the growth of green industries, sustainable tourism, and digital economies. Enhanced international transport links, such as improved air and sea freight capabilities, will be crucial to maintaining Scotland's competitiveness in global markets. Investment in transport infrastructure, such as ports, railways, and ultra-low and zero carbon public transport, will be required to unlock economic opportunities and drive regional growth. The integration of transport and spatial planning will help create hubs of sustainable economic activity. Additionally, the transport sector itself will play a key role in Scotland's green economy, creating jobs and fostering innovation in areas such as electric vehicle manufacturing, renewable energy integration, and sustainable construction.

Global security

Global insecurity, including geopolitical tensions, economic volatility, and supply chain disruptions, will have far-reaching implications for Scotland's transport sector. Increased energy prices or shortages could impact transport costs and the affordability of travel, while global supply chain challenges may affect the availability of materials required for infrastructure projects or the transition to electric vehicles. Scotland's reliance on imported goods and resources will necessitate greater resilience in freight and logistics systems, with a potential shift towards more localised supply chains. Security concerns, including cyber threats, will also require robust measures to protect transport infrastructure, systems, and data. On a broader scale, global insecurity may heighten the importance of transport as a lifeline for communities, particularly in rural and island areas, reinforcing the need for reliable and accessible services.

KEY MESSAGE

Scottish Government should consider the balance of challenges and opportunities to prioritise transport infrastructure investment, to make more inclusive, sustainable and resilient, while supporting the nations' economic growth and environmental objectives. This includes planning for an ageing population requiring more accessible, reliable and affordable public transport; and effective collaboration to ensure infrastructure aligns with broader public sector priorities such as health, education and housing. We need to continue the progress in decarbonisation and ensure transport is resilient to climate impacts. Transport will also need to be strengthened against external threats including cyber security and global insecurity. With all of these needs there should be some consideration of innovative approaches to finance and delivery such as road pricing or congestion charges.

Scotland's Infrastructure

Renfrew Bridge

New opening road bridge improving cross-Clyde connectivity and access to jobs, services and development sites.

LOCATION: Glasgow City Region

STATUS: Complete ●

👤 **PRIORITISING PLACE**

The Renfrew Bridge, opened in May 2025, is a 184-metre, twin-leaf, cable-stayed swing bridge across the River Clyde, providing two traffic lanes and dedicated walking and cycling paths. As the first opening road bridge on the Clyde, it improves connectivity between Renfrew and Yoker/Clydebank, reducing reliance on ferries and alternative crossings.

Fabricated offsite and installed via barge, the bridge maintains a 90m-wide navigable channel when closed, with unrestricted vertical clearance when open.

Delivered by Renfrewshire Council under the Glasgow City Region City Deal, the project enhances access to jobs, services, and development sites, recording over one million crossings within four months of opening.

> To reach one million crossings of the Renfrew Bridge so quickly is a fantastic achievement and a clear sign of the requirement for the Clyde Waterfront and Renfrew Riverside project. It is not only supporting people to commute to work, but also to access businesses, education and leisure opportunities on both sides of the river and its popularity demonstrates the positive impact strategic investment in transport infrastructure can have. It's also great to see that thousands of people are walking and cycling across the bridge each month as we encourage more active ways to travel and it's a new travel link that we are proud to have delivered in Renfrewshire.

IAIN NICOLSON, RENFREWSHIRE COUNCIL LEADER

⚙ Drivers of Change

Energy

Energy is undergoing a significant transition. The long-standing fundamentals of oil and gas, and electricity mainly generated from coal and nuclear has been changing for some time. Electricity from renewable sources is growing rapidly, bringing new transmission needs and increasingly, energy storage challenges and opportunities.

Low carbon modalities include renewable energy options such as wind, solar, tidal as well as other solutions such as hydrogen, alongside storage solutions such as Battery Energy Storage Systems and pumped hydro storage to support grid resilience. The opportunities of this transition are immense, creating economic opportunities alongside reducing emissions to help achieve climate ambitions. The levels of investment required are also significant.

Energy is a largely reserved policy area, with UK Government delivering on the wider policy and legislative framework and financial incentive mechanisms, while the Scottish Government plays a key role in using devolved powers of planning and project development to support ambitions. The Scottish Government vision for the energy transition is outlined in the Draft Energy Strategy and Just Transition Plan (2023) and focuses on renewable energy expansion, improving energy efficiency, and fostering the growth of a Scottish energy sector.

The main components of the energy system include generation, transmission, distribution, storage, and supply. Scotland's energy generation has a strong focus on renewables, particularly onshore and offshore wind. In 2023 70% of all electricity generated in Scotland was from renewable sources, while 91% was generated from low carbon sources including nuclear and pumped storage. Scotland's energy infrastructure has seen significant investment over the past

91%
In 2023, 70% of electricity in Scotland was from renewable sources, with 91% from low carbon sources

two decades with wind energy, both onshore and offshore, accounting for most of the growth. As one of the current ten operational offshore wind farms, the Seagreen Offshore Wind Farm off the Angus coast is the largest, while onshore the Viking Wind Farm in Shetland is the largest of 332 operational sites. Scotland is also advancing its capabilities in tidal and wave energy, bioenergy, and solar photovoltaics.

Scotland also continues to have a significant role in oil and gas production, with half of UK gas and the majority of the UK's oil production coming

from fields in Scottish waters, despite production being 35% of its 1999 peak.

Irrespective of generation source, energy assets remain considerable, with the combined value of all the UK gas and electricity networks alone estimated in 2018 to be £64 billion. The Scottish Government does not currently support further nuclear power investment, with only one EDF-station in Torness still generating energy and four currently being decommissioned. However, the UK Government has committed to new nuclear being part of the energy mix to support a low carbon and resilient energy supply.

£64bn
is the estimated combined value of UK gas and electricity networks (2018)

Scotland's Infrastructure

They have taken majority public sector ownership of Sizewell C and committed to a wholly public sector owned first Small Modular Reactor project in North Wales, enabling investment in one of Europe's first Small Modular Reactor programmes.

Electricity transmission in Scotland is managed by SP Transmission and SSEN Transmission, both subsidiaries of major energy firms, while gas transmission is handled by National Gas. Distribution of energy to homes and businesses is overseen by Scottish and Southern Electricity Networks in the north and ScottishPower Energy Networks in the south, with Scottish Gas Networks managing the gas distribution network. The National Energy System Operator (NESO), is an independent public body responsible for managing and planning the UK's electricity and gas networks. NESO's responsibilities combine real-time system operations with strategic, long-term planning. The regulatory framework is led by Ofgem, which oversees price controls and environmental improvements, while Marine Scotland regulates marine energy projects. Crown Estate Scotland oversees leasing for offshore renewables, as well as emerging technologies such as Carbon Capture and Storage solutions.

Cross-border transmission projects, such as the Western HVDC Link and Eastern Green Links are increasing capacity to export renewable electricity to the rest of the UK. The development of robust transmission and distribution networks is strategically important for Scotland, ensuring renewable energy generation can be utilised and is stable.

The development of robust transmission and distribution networks is strategically important for Scotland, ensuring renewable energy generation can be utilised and is stable.

As part of localised transmission networks, Scotland's heating infrastructure is also undergoing changes, with the development of heat networks. This is supported by energy efficiency measures central to decarbonising heat by 2045. Local Heat and Energy Efficiency Strategies and the Heat Networks (Scotland) Act 2021 are part of the drive to deliver on this transition.

Hydrogen production and Carbon Capture, Utilisation, and Storage (CCUS) are emerging as important technologies in the path to net zero. Scotland aims to be a substantial producer

5GW
Scotland aims to produce 5GW of clean Hydrogen by 2030

25GW
and 25GW of clean Hydrogen by 2045

of green hydrogen to assist in managing the peaks and troughs of a renewables-dominant electricity system. UKG has committed £200m of development funding to support the Acorn Transport and Storage project at St Fergus.

Energy is a large sector, ensuring its transition is effective and supports wider policy objectives requires a clear integration of parts and an understanding of the opportunities and challenges.

Scotland's Infrastructure

⚖️ Opportunities and challenges

Scotland's energy sector is at a pivotal point, with both challenges and opportunities shaping its transition to a low-carbon future. As a global system, there are pricing barriers to the growth of low-carbon electricity generation, affected by the unfavourable ratio of electricity prices to gas prices, technically referred to as the spark gap. The UK gap is the highest in Europe, with electricity prices hindering the viability of some investments. Other hurdles include competing demands for land use, the need to decarbonise heat amidst financial, technical, and regulatory barriers, and the inadequacy of existing grid infrastructure to handle increased renewable energy generation, with its variable input. Planning and consenting remains challenging for renewable projects, alongside a shortage of skilled workers in critical areas like offshore wind and Carbon Capture, Utilisation, and Storage (CCUS).

£90bn
Ofgem identified investment of £90bn required until March 2031, with an initial £28bn of upfront investment

Additionally, public support and behavioural shifts are needed, as some communities remain resistant to large-scale renewable projects. While fuel poverty remains a key concern, particularly in rural and island communities, where energy costs are higher. And, reskilling the workforce as the oil and gas sector declines will be essential to ensuring a just transition.

Despite these challenges, Scotland's energy sector is well-positioned to capitalise on a range of opportunities. The energy transition is a cornerstone of achieving net zero, with the potential to create jobs in low-carbon industries, particularly in renewables and their supply chains.

> Scotland's reputation as a global leader in renewable energy, backed by its robust infrastructure, makes it an attractive destination for international investment.

Significant growth is anticipated in offshore wind energy, not yet at the same scale as onshore wind, and the development of CCUS, which could repurpose existing North Sea oil and gas infrastructure. The levels of investment across generation, storage and transmission are anticipated to be substantial. Ofgem recently identified an investment pipeline of £90bn over the RIIO-3 period until March 2031 alone with an initial £28bn of upfront investment approved.

Community-led energy projects, supported by initiatives like the Community Energy Generation Growth Fund, offer the potential to empower local communities, reduce reliance on external suppliers and generate income for community projects.

Scotland's renewable energy expertise and infrastructure also provide significant export opportunities, particularly in the emerging global hydrogen economy.

By addressing its challenges strategically and systemically, Scotland has a unique opportunity to solidify its position as a global leader in the renewable energy sector, driving economic growth and contributing to a sustainable future.

Scotland's Infrastructure

Key drivers

Reflecting the importance of this sector for economy, climate and society, the drivers are likely to impact on a number of areas:

Demographics

Demographics changes will likely impact on energy demand and consumption patterns. An ageing workforce may further exacerbate energy skill shortages in key and emerging energy sectors such as CCUS, requiring targeted skill training to support the energy sector.

Climate change

Climate change will remain one of the most significant drivers, accelerating the need for renewable energy development and decarbonisation efforts. Rising temperatures and extreme weather events could disrupt energy infrastructure, requiring a greater focus on adaptation. At the same time, global and national commitments to reduce greenhouse gas emissions will continue to push the sector towards cleaner energy sources, while requiring innovation in grid management and energy storage solutions. Data and technology developments will support ambitions for an efficient system, further impacting on climate mitigation efforts. This is likely to include data analytics, the Internet of Things and smart grids technologies. There are however global vulnerabilities in the demand for critical minerals to support climate change technologies.

Economic priorities

The energy transition is seen as a significant economic opportunity for Scotland in developing jobs and new markets. As Scotland seeks to maintain its reputation as a global leader in renewables, the energy sector will likely attract substantial international investment, creating jobs and boosting economic growth. However, balancing these priorities with affordability for consumers and addressing fuel poverty will remain a challenge, particularly as energy prices fluctuate and the costs of the transition are distributed across society. Data and technology developments to support smarter and more efficient systems will also help drive economic developments. Ensuring that investment levels can be maintained to meet the overall requirements will also be a key issue to address.

Global security

The energy transition is closely aligned with global security concerns and a desire for energy resilience, including less reliance on remaining energy imports. While oil imports are minimal, as the North Sea production continues to decrease over the long-term, this is likely to become a greater challenge unless alternative fuels become more readily used. Addressing the issues noted to sustain the energy transition economic opportunities, will support energy resilience. Events such as conflicts or trade disruptions could affect the availability of critical materials, such as rare earth elements used in wind turbines and batteries. This may however drive accelerated development of indigenous renewable resources and technologies to mitigate potential risks. System-wide resilience to cyber-threats is likely to become an increasing consideration.

KEY MESSAGE

Stakeholders across the energy sector have a role to ensure the sector opportunities are realised and challenges overcome. This requires a strategic and systemic approach, including unlocking private sector investment by effective collaboration and targeted interventions to create market confidence and generate pace. Addressing skill shortages and the ageing workforce, to sustain the emerging energy sector jobs will be essential. There needs to be a focus on addressing resilience challenges, including grid requirements for an evolving sector; climate and global vulnerabilities, such as the demand for critical minerals impacting longer-term objectives; and creating assets resilient to a changing world. Addressing pricing and fuel poverty challenges need targeted attention, including influencing UK Government regulation to work best for Scottish projects and consumers, and targeting public financing to catalyse new markets. Understanding and addressing public opposition to some opportunity areas will support transition ambitions.

Scotland's Infrastructure

Waste

Waste disposal is a service we all rely upon, intersecting with our homes, communities and businesses. The public sector has a key role in collecting and disposing of household and some commercial waste, alongside the private sector.

While there is no monetary estimate of the value of the waste sector and its infrastructure, it is anticipated to be growing, as we change our perspective from waste as something to deal with, to an area of economic opportunity alongside a focus on zero waste to support climate mitigation. Recycling, the circular economy and energy from waste continue to drive these priorities.

> Driven by the ambition for a low-carbon and zero-waste economy, the waste sector in Scotland has undergone significant changes over the past two decades.

Responsibility for waste management is shared across several stakeholders, including Scottish Government, local authorities, Zero Waste Scotland, private waste management companies, and the Scottish Environment Protection Agency (SEPA). Together, these bodies oversee waste policy, regulation, collection, disposal, recycling, and the development of sustainable practices. The Scottish Government's Circular Economy Act (2024) and its Circular Economy and Waste Route Map to 2030 aim to accelerate the transition to a circular economy, prioritising waste reduction, increased reuse, modernised recycling systems, and decarbonised disposal methods.

50%
Waste sent to landfill halved over the past decade to 2022

43.5%
Household recycling increased to 43.5% in 2023
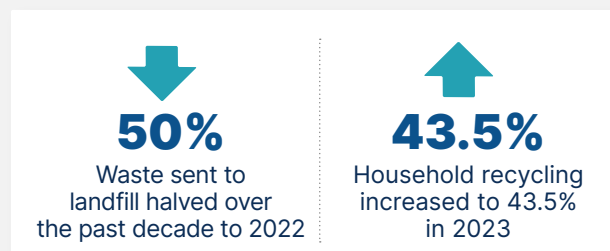
Scotland has made significant strides in waste reduction, with the total volume of waste sent to landfill halving over the past decade. In 2023, the amount of household waste generated fell to its lowest level since records began in 2011, with a household recycling rate of 43.5%. The biodegradable municipal waste ban and the Scottish Landfill Tax have been critical in reducing landfill dependency, however as we will see there are challenges in meeting long-term waste reduction and management ambitions.

Energy from Waste (EfW) technologies offer a route for managing residual waste which cannot be reused, recycled or recovered. Facilities use this residual waste to generate electricity and heat, using new technologies. In 2018 there were fourteen operational plants in Scotland, managing a mix of municipal and processed commercial and industrial waste.
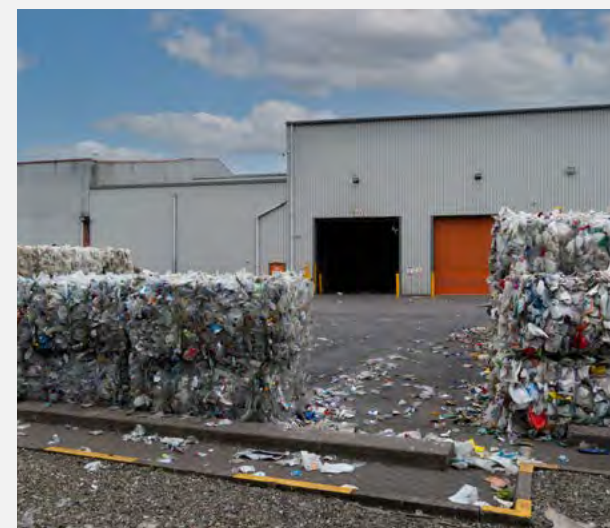
Scotland has also made significant investments to support its waste and circular economy objectives, including the Recycling Improvement Fund and the Circular Economy Investment Fund. These initiatives aim to modernise recycling infrastructure, support innovation in businesses, and reduce the reliance on landfill and incineration. Additionally, digital innovations, such as the planned UK-wide Digital Waste Tracking System (launching in 2026), will improve the monitoring and reporting of waste flows, enabling better strategic planning.

Scotland's Infrastructure

⚖️ Opportunities and challenges

Despite significant progress, challenges remain within the waste sector to mitigate for climate change and support low-waste ambitions. This includes compliance issues in the landfill industry, which has faced a poor record due to legacy problems like odour and difficulty meeting environmental regulations. Additionally, the twin objectives of achieving net zero ambitions alongside waste reduction targets can be difficult to balance.

While the biodegradable municipal waste ban and the Scottish Landfill Tax have been critical in reducing landfill dependency, stimulating innovation to meet future waste reduction targets continues to be important. This includes increasing recycling rates.

Socio-economic factors pose additional obstacles, including public opposition to the establishment of EfW sites in urban areas and the ongoing need to drive behaviour change to reduce landfill waste. Furthermore, consumption patterns in Scotland remain a factor, requiring a shift in societal attitudes and habits towards reducing waste and embracing more sustainable choices. This includes balancing measures such as taxation to reduce landfill against behaviours such as fly tipping, where taxation as a push factor should be considered. Scotland has a National Litter and Fly tipping Strategy that needs to align with other waste ambitions and waste management incentives.

Despite these challenges, there are numerous opportunities to continue to drive innovation and best practice in the waste sector in Scotland. Advances in data and technology present significant potential, particularly in the development of new processes for EfW and circular economy solutions. These innovations can support waste management, improve recycling rates, and enhance resource efficiency. Additionally, developing robust residual waste plans and modernising recycling systems offer the chance to not only improve waste management services but also to reduce landfill dependency further and build a more sustainable, resource-efficient system. The new UK-wide tracking system has the potential to help drive a more robust end to end waste economy, supporting waste management ambitions.

In summary, while the waste sector faces pressing challenges in environmental compliance, emissions reduction, and societal behaviours, Scotland has an opportunity to leverage technology, innovation, and targeted policy to effect progress in the waste sector. It requires a system approach, addressing consumption patterns, improving regulatory compliance, and fostering public support for sustainable waste solutions. This approach can help the sector play its part in achieving Scotland's net zero ambitions and the opportunities of an integrated circular economy.

Scotland's Infrastructure

Key drivers

In continuing to build upon the opportunities within the sector and mitigate for challenges over the longer-term, the key drivers should be considered:

Demographics

The changing demographics will likely see an impact on the scale of waste generated as well as the spatial patterns of waste produced. Local authorities will need to adapt collection and disposal systems to meet shifting demographic demands, while also ensuring equitable access to recycling and waste services in both urban and rural areas.

Climate change

Climate change is already at the heart of the waste policy in Scotland. This will continue to drive decisions, particularly in reduction of landfill gas and the potential of technologies such as EfW facilities for residual waste management, and CCUS in support of waste energy systems. Addressing the issues we have identified will be essential to manage this imperative.

Public service reform

While the public sector is reforming and changing, it will continue to have a prime role in shaping and driving waste policy. Reducing waste as part of the prevention drive, alongside creating a more efficient sector, with the use of technology such as the Digital Waste Tracking system, as well as joining up the waste sector through collaboration between public bodies, businesses, and communities, will all support a more effective sector. Supporting behaviour change initiatives as part of that drive will be important.

Economic priorities

The potential for new technologies and the expansion of opportunities such as EfW can support the economic opportunities of waste management. This includes creating greater efficiencies through data opportunities such as the UK-wide Digital Waste Tracking System, energising the sectoral opportunities. Creating a clear waste economy, to incentivise effective low carbon waste management systems will be part of the solution.

Global security

The international waste sector could be disrupted by global insecurity. Equally, it could help drive greater national resilience, particularly in the use of recycled materials.

Scotland's Infrastructure

⊗ KEY MESSAGE

The private and public sector have roles to exploit the opportunities of the waste sector, while addressing challenges. Public sector levers to support the generation of an effective waste management sector should be further explored, supported by robust residual waste plans and modernised recycling systems, as well as enforcement and leading on data and technological developments. Behaviour change needs to be addressed in supporting waste reduction and management, including addressing concerns around the use of new technologies.

Water (incl. flood management)

Public water and sewerage is publicly owned, operated and regulated in Scotland. It is a significant asset, part of a water sector which generated £3.7 billion in turnover in 2019. Scottish Water, Scotland's public water company, has one of the largest infrastructure investment programmes in Scotland, investing £1.2 billion in 2023/24.

The water sector is part of an integrated system which supports public health, economic growth, and the environment. Responsibility for water is shared across several organisations, with the Scottish Government setting national water policy, including flood prevention and warning systems. Scottish Water is at the forefront of delivering public water and sewerage services. Meanwhile, regulation is managed by several agencies including the Scottish Environment Protection Agency (SEPA) as Scotland's principal environmental regulator, the Water Industry Commission for Scotland as the economic regulator of Scottish Water, the Drinking Water Quality Regulator ensuring water safety, with this regulation supported by organisations ensuring consumer representation.

£120bn
Assets managed by Scottish Water are valued at £120 billion

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority, working closely with other organisations responsible for managing flood risk, through a network of partnerships and stakeholder groups to ensure that a nationally consistent approach to flood risk management is adopted. It has a statutory duty to produce

Scotland's Flood Risk Management Strategies, which are developed for each of the 14 Local Plan Districts in Scotland. They are approved by Scottish Government and published by SEPA although they are developed in collaboration across all 32 local authorities, Scottish Water, and other organisations with a responsibility or interest in managing flooding. Local Flood Risk Management Plans are the responsibility of Local Authorities, developed in parallel, providing additional local detail on the funding and delivery timetable for actions. Local Flood Risk Management Plans and Flood Risk Management Strategies are updated every six years.

Scotland's water infrastructure is significant, with assets managed by Scottish Water valued at £120 billion. This consists of 229 water treatment works, over 48,000km of water pipes, and 54,000km of sewer pipes. Each day Scottish Water delivers 1.49 billion litres of clean drinking water and treats 1.07 billion litres of wastewater. Reflecting the scale of this system, £6 billion was invested in water assets between 2021 and 2027. This funding focuses on ensuring resilience, adapting to climate change, and meeting environmental and statutory obligations. However, as we will discuss, challenges such as ageing infrastructure, leakage, and the impacts of extreme weather continue to test the sector's capacity.

Scotland is fortunate to have abundant water resources, with over 125,000km of rivers, 30,000 lochs, and significant groundwater reserves. These resources are central to the nation's economy, supporting industries such as agriculture, whisky production, and hydropower. Hydropower plays a key role, with Scotland holding 85% of the UK's hydroelectric capacity. Since 2010, Scottish Water has installed turbines at 28 sites, generating power to offset energy use at treatment works and exporting surplus to the national grid.

125,000km
Scotland has over 125,00km of rivers and 30,000 lochs

Scottish Water's long-term [strategies](#), including *Our Sustainable Future Together* and its forthcoming SR27 Business Plan (2026), aim to ensure the sustainability, resilience, and affordability of services. These plans prioritise reducing carbon emissions, improving resilience to climate change, and addressing demographic pressures. Modernisation of infrastructure is also key, with efforts to separate sewer systems and reduce storm overflows as urban populations grow.

As Scotland's [Hydro Nation](#) initiative seeks to position the country as a global leader in water sustainability and innovation, the sector's importance to the environment, economy, and society continues.

Scottish Government and CoSLA have agreed that a minimum of £42 million per year capital grant will be available in the 10 years from 2016-2026 for flood protection schemes, with 80% of the total

85%
of UK's hydro capacity
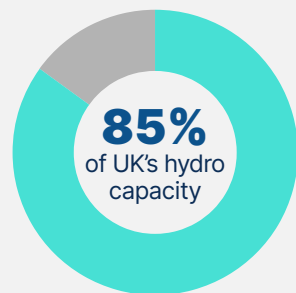
available allocated to large scale projects prioritised in the Flood Risk Management Strategies, and the remaining 20% allocated to local authorities to contribute to other elements contained in these strategies. In recent years the flood protection scheme delivery programme has provided protection for communities at a rate of between 400 and 800 properties per year. £570 million will be invested in flood resilience in the period 2016- 2026. Since 2016, 16 flood protection schemes have been completed, 4 are under construction and a further 11 are in the early stages of development.

⚖️ Opportunities and challenges

One of the most significant challenges for the sector is the scale of funding required to maintain and adapt Scotland's water infrastructure. Over the next 25 years, an estimated £50 billion will need to be invested in water and wastewater services. Of this, £2 billion to £5 billion is specifically required to make assets resilient to the impacts of climate change.

£50bn
Water services need £50 billion investment over the next 25 years

Rising costs further compound this challenge, with repair expenditure increasing by 15% in 2024 compared to the previous year, from £139 million to £161 million. Addressing ageing infrastructure remains critical, as many assets approach the end of their operational lifespan, necessitating significant maintenance and replacement programmes.

The prevalence of combined sewers also presents a technical challenge, as these legacy systems struggle to cope with modern demands and extreme weather events. Combined with the risks posed by climate change, such as more frequent storms and droughts, the reliability of Scotland's water services could be undermined if solutions are not implemented. Leakage reduction remains a key priority, as leakage levels increased in 2024 for the first time since 2007. Equally the challenges of balancing supply and demand while also supporting other government ambitions such as new housing development are difficult to manage. Demographic changes including short term population growth and increased housing developments place additional strain on water resources, as does the rising demand for water-intensive energy production, particularly hydrogen.

Despite our rich water assets, Scotland must not only reduce water consumption levels, but also address the challenges posed by climate changes.

Scotland's Infrastructure

180 litres

Scotland averages 180L of water per person per day – more than other European countries

Climate resilience is another pressing issue. Despite our rich water assets, Scotland must not only reduce water consumption levels – currently averaging 180 litres per person per day, above other European countries – but also address the challenges posed by climate changes. This includes supply challenges as more sustained low rainfall periods are anticipated, flooding due to more frequent and severe weather events, and the impact on water quality due to increased temperatures and changing rainfall patterns.

Scottish Water's 2024 Climate Change Adaptation Plan forecasts that without action, water quality will deteriorate, sewer flooding incidents will rise, and resilience will be compromised, further straining the system.

While these challenges are very real, the water sector has continued to innovate and has several opportunities to adapt to future needs. Advances in data and technology present significant potential for improving efficiency and cost-effectiveness. Real-time monitoring systems and predictive maintenance technologies can help reduce leakages, optimise asset management, and plan for replacements. These tools not only mitigate operational risks but also reduce long-term repair costs.

Nature-based solutions offer another evolving avenue for creating a more resilient water system.

By working with natural processes, such solutions can enhance flood management, improve water quality, and provide environmental and community benefits. These approaches align with Scotland's ambitions to promote sustainability while protecting its natural environment.Behavioural change also holds significant socio-economic potential.

Evidence suggests that public campaigns to reduce water consumption can be effective, particularly when the environmental benefits are clear and tangible. Encouraging households to adopt more water-efficient behaviours could reduce demand, avoiding the need for costly new infrastructure like reservoirs and treatment works.

As flood risk increases active management will be required to mitigate the impact across Scotland

SEPA published its most recent National Flood Risk Assessment in December 2025. In that assessment it estimated that c. 400,000 properties – homes, businesses, and vital services – are in areas at medium risk of flooding in 2025, which is 1 in 8 properties across Scotland, and a sharp rise from 284,000 in 2018.

Flooding can occur from a number of distinct sources, each of which needs to be considered and addressed:

- **Rivers:** Heavy rainfall causing river levels to rise above their banks, leading water to spill out and cause flooding.
- **The sea:** High tides, storm surge and large waves causing coastal flooding, especially during severe weather.
- **Surface water:** Intense rainfall unable to drain naturally or through drainage systems, collecting or flowing over the surface, causing localised flooding. Most common in urban areas where impermeable surfaces hamper natural drainage.
- **Small watercourses:** These behave like rivers but are smaller and often react more quickly to heavy rain.
- **Groundwater:** Water rises from underground or flows from springs.

Flood risk can be categorised as High risk (greater than 1 year in 10 likelihood), Medium risk (greater than 1 in 200 likelihood) and low risk (greater than 1 in 1000 likelihood). Flood risk can also be expressed in terms of both frequency and depth. Shallower, more frequent flooding (less than 30cm deep) can still be considered high risk particularly if fast flowing or if the water is contaminated. However in situations such as this with good data and forward planning, specific action can be taken to prepare and make many properties more

Scotland's Infrastructure

resilient at a property level. Deeper flooding (of at least 30cm) provides potential risk to life and damage to property and infrastructure. Flowing water at a depth of 30cm can be enough to move an average family car and can cause internal property damage. Floods of this depth are more disruptive and have a longer term impact in terms of recovery to infrastructure, property and the wider community. Therefore, managing the impacts of deep flooding will require co-ordinated plans and activity across a range of stakeholder organisations and communities in terms of preparedness, response and recovery and long-term catchment management, flood protection investment and climate adaptation measures.

634,000

estimated properties at risk of flooding by 2100

SEPA estimates that by 2100, climate change could push the number of properties at risk to 634,000. It also identified that coastal communities face the biggest surge, with the risk from the sea is projected to more than double. According to SEPA, flooding already costs Scotland an estimated £500 million every year – and that figure could grow based on the risks identified.

Key drivers

Unsurprisingly for such an essential asset, which receives significant public investment, water is affected by all of our key drivers:

Demographics

Population changes are likely to affect the demand for water and where it is needed. Water demand and solutions are likely to be different across the country, influenced by this changing demographic. We are already seeing increased demand in the east coast of Scotland as the long-term pattern of movement of people continues. This area is also being affected more by changing rainfall patterns, already creating resilience and flood management challenges to meet this increased demand. Rising demand from new housing will require investment, balanced against supply/demand management.

Public service reform

As the public sector balances financial constraints with environmental sustainability and a need for greater efficiency there will be a need to ensure adequate funding provision to maintain and adapt ageing infrastructure, including consideration of collaborative and innovative financing mechanisms. Data and technology has a key role in supporting efficiency, with new tools such as smart sensors and data analytics providing resource management and planning opportunities. Transparency and accountability will remain essential, with regulators like SEPA and the Water Industry Commission for Scotland driving efficiency, environmental compliance, and customer satisfaction.

Scotland's Infrastructure

Climate change

Climate change is arguably the most pressing long-term driver for the water sector. More frequent extreme weather events, such as storms, intense rainfall, and prolonged droughts, will strain both water supply, wastewater systems and the need to manage and mitigate flood risks. Rising temperatures may degrade water quality, increase risks of algal blooms, and threaten ecosystems dependent on Scotland's water environments. By 2050, Scotland could see a fourfold increase in water supply deficits during drought conditions, alongside a rise in sewer flooding incidents and wastewater overflows as well as associated flood risk events. The sector will need to invest heavily in climate adaptation measures, such as resilient infrastructure, improved drainage systems, proactive water resource management and flood risk management schemes. Reducing water consumption and addressing leakage will also be critical in mitigating the impacts of climate change alongside the financial challenges across the public sector.

Economic priorities

Scotland's water sector is integral to the country's economic priorities, supporting industries such as agriculture, whisky production, hydropower, and hydrogen energy. The push towards net zero emissions and renewable energy will increase water demand for green energy technologies, particularly hydrogen production, which relies heavily on water for electrolysis. At the same time, economic growth and infrastructure development will require water networks to expand and modernise. The water sector will need to balance economic priorities with environmental sustainability, ensuring that industrial and commercial demands do not compromise water quality or ecosystem health. Additionally, the sector's role in supporting economic resilience, such as through hydropower development and nature-based solutions, will become increasingly important. The increased risk of flooding events affecting infrastructure and businesses will need to be adequately addressed, to minimise and mitigate the potential economic impact.

Global security

Global insecurity, including geopolitical tensions, resource competition, and supply chain disruptions, could have implications for Scotland's water sector. For example, interruptions to the supply of critical materials and equipment could delay infrastructure projects or increase costs. Additionally, global water scarcity and climate-related migration may increase pressure on Scotland's water resources. Cybersecurity will also become a key concern, as water infrastructure may be vulnerable to cyber attacks, threatening essential services and public safety. The sector will need to strengthen its resilience to external shocks through robust risk management and contingency planning.

KEY MESSAGE

Scottish Water has a central role in driving an efficient water system in Scotland, while managing flood risk and other climate challenges. Addressing ageing assets and maintenance needs to remain a focus, however the scale of these challenges may require consideration of new financing mechanisms. Balancing supply and demand is another area for continued focus, with a changing demographic and increase in homes built likely to further exacerbate climate-related water deficits, while water remains a priority for industry. Behaviour changes to reduce consumption should be a focus, while innovation in data and technology should continue to support efficient asset management. The sector will also need to consider supply resilience, in response to national and international shocks and threats. Increasing rainfall intensity and more frequent extreme events (including periodic low rainfall/drought) will raise river and surface-water flood risk across Scotland. Rising sea levels and storm surges threaten coastlines, estuaries and island communities, increasing the scale and cost of coastal defence, and relocation decisions.

Scotland's Infrastructure

Loch Katrine Peatland Restoration

Infrastructure investment to protect a strategic drinking-water catchment and support net zero.

LOCATION: Loch Katrine, Loch Lomond & The Trossachs National Park

STATUS: Current ●

🌱 **NATURE POSITIVE**

The Loch Katrine Peatland Restoration is a 10-year programme led by Scottish Water to restore 400 hectares of degraded peatland in the Loch Katrine catchment, which supplies drinking water to over 1.3 million people in Greater Glasgow and the Central Belt.

The project blocks drains and reprofiles peat hags to reduce runoff, improve water quality, and store carbon, supporting Scottish Water's 2040 net-zero target. Phase 1 has restored over 50 hectares.

Delivered in partnership with Forestry and Land Scotland, Loch Lomond and Trossachs National Park, and Peatland ACTION, the programme integrates peatland restoration with woodland creation, leveraging public climate finance and ongoing monitoring to optimize hydrological, ecological, and carbon outcomes.

> Often these areas were used for sheep grazing, so measures were put in place to drain the water from the land to make it more suitable for this. This, combined, with large numbers of deer trampling the vegetation has exposed really large peat hags which have no vegetation growing on them and which allow water to wash straight off them into the loch. This is a long-term programme of work with the aim of trying to keep as much water up on the hillside as we possibly can, so that we can limit the amount of peat and organic material that is draining off into the water supply.

ALAN MACDONALD, SCOTTISH WATER PROJECT MANAGER

Scotland's Infrastructure

Telecommunications and digital

Telecommunications covers the networks and physical components that enable digital communication, including fixed, wireless and mobile networks, satellite communications and subsea cables.

The telecommunications and digital sectors are closely integrated, including digital sector assets such as datacentres supporting an efficient telecoms industry, by managing and processing telecoms data for cloud services, hosting, and content delivery.

> From broadband to mobile networks, telecoms infrastructure supports economic growth, social interaction, and access to vital services such as health and social care and education.

It has also has a role in addressing population decline and delivering inclusion and equity, through improved access to services.

Telecoms and digital are primarily a reserved policy matter, led by The Department for Science, Innovation and Technology, and regulated by Ofcom. However, the networks and physical components are primarily privately owned, with private telecommunication companies retaining responsibility for deploying broadband, wireless and mobile infrastructure, supported by regulatory and financial facilitation from UK and Scottish Government bodies. The wider Scottish public sector has been active in encouraging, supporting and underpinning much of this infrastructure. Alongside this, Scotland continues to support sustainable telecoms and digital investment through the policy and planning regime.

The Scottish Government's long-term digital vision was recently updated in November 2025, with a joint publication with Scotland's local authorities. This sets out an ambition for digital solutions that connect people to opportunities, delivers improved public services, and creates economic growth. A delivery plan for one of these priority areas, sustainable digital public services, was published alongside the updated vision. Other strategic documents, such as the 5G: Strategy for Scotland (2019) and Ofcom's Connected Nations: Scotland Report (2025), provide further guidance and analysis on connectivity improvements undertaken and needed. As interdependent infrastructure, in 2021 Scottish Government also produced a vision and action plan for Green Datacentres and digital connectivity.

This focuses on four pillars of:

1 >
Green datacentres market development

2 >
Low cost renewable energy

3 >
Terrestrial wholesale fibre connectivity

4 >
International subsea fibre connectivity

Scotland's Infrastructure

This vision and action plan identified several specific actions to make Scotland's sector more resilient and attractive, creating investment opportunities. Scottish Enterprise and Scottish Government are advancing this activity.

Beyond policy and strategy, organisations like the Digital Office working with Scottish local authorities, Skills Development Scotland, and the Scottish Cyber Coordination Centre, provide expertise in digital transformation, workforce development, and cyber resilience, respectively.

£463m

invested in extending superfast broadband to over 95% of premises

Scotland has made significant investments to expand its telecoms infrastructure. The Digital Scotland Superfast Broadband programme, launched in 2013, invested £463 million to extend superfast broadband to over 95% of premises by 2020. Building on this, the Scottish Government committed £600 million to the Reaching 100% programme, which aims to deliver gigabyte-capable connections by 2028. Complementing this is Project Gigabit, a £5 billion UK-wide initiative focused on extending gigabit broadband to hard-to-reach areas. In mobile connectivity, the Scottish 4G Infill Programme (which invested £28m) and the Shared Rural Network are addressing mobile 'notspots' in rural regions through collaboration with mobile network operators.

This is a sector that continues to innovate, and more recent Scottish Government funded projects include two pilots with both Orkney Ferries and ScotRail to trial satellite communications, addressing notspots for both passengers and transport operators. This leverages Low Earth Orbit Satellites which deliver speeds of at least 200 Megabits per second, with Wi-Fi technology distributing the signal.

85%
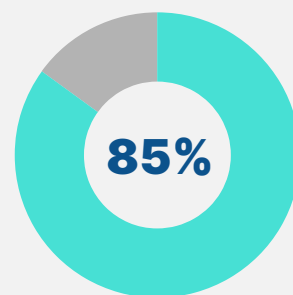
Gigabit capable urban area coverage in 2024

43%
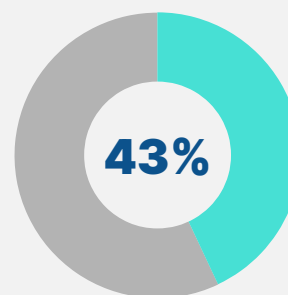
Gigabit capable rural area coverage in 2024

48%

4G geographical coverage in Scotland in 2023

65%

4G geographical coverage in Scotland in 2024

Notable progress has been made in improving both broadband and mobile coverage across Scotland. Full-fibre connectivity now reaches 62% of residential premises, although rural areas lag behind at 42%. Over three-quarters of Scottish households (77%) have access to gigabit-capable services, with urban areas seeing 85% coverage compared to 43% in rural regions. Mobile connectivity has also improved, with 4G geographic coverage across Scotland increasing from 48% in 2023 to 65% in 2024, though there are still significant gaps, while the user experience is not always what would be expected of the available coverage. There are challenges in the sector, with gaps in coverage (particularly in rural areas), capacity issues constraining experience, or a lack of competition limiting consumer choices, as well as areas for development including green datacentres and international subsea cables, which lag behind policy.

Scotland's Infrastructure

⚖️ Opportunities and challenges

While significant progress has been made, there are still challenges, with Scotland the least connected of the UK's four nations. Rural areas continue to experience lower broadband speeds and mobile coverage. The challenging topography, particularly in more rural and harder to reach areas of Scotland is one reason for undermining the roll out of programmes. Data usage is also the lowest in the UK, with rural areas again particularly disadvantaged due to older technology and slower download speeds. While not limited to rural areas, these issues exacerbate socio-economic disparities as digital inclusion and skills development are not yet universal.

The push towards achieving net zero also presents a challenge for the sector.

Data centres, which are considered vital for digital infrastructure performance and resilience, are energy-intensive, requiring innovative solutions to align with environmental sustainability goals.

In addition, the increasing reliance on a digitalised world has seen the increasing prevalence of cyber threats and data security issues. As digital infrastructure becomes more integral to public services, businesses, and individual lives, this issue is likely to become more pronounced if not addressed. Despite these challenges, Scotland's telecommunications sector is full of opportunities to drive innovation, improve public services, and support economic growth.

The expansion of mobile/5G networks can play a pivotal role in sustaining remote and rural communities by providing reliable connectivity.

This could help combat rural depopulation by enabling digital technologies to support remote working, education, and economic development in isolated areas. Continued innovation such as satellite technology may play a part in achieving connection for the most hard to reach communities and locations.

Leveraging the telecoms network offers significant potential for public service reform, enabling better use of data and technology to improve service delivery. The recently published action plan identifies some of these opportunities. The health and social care sectors in particular are considered to have significant use cases for using technologies such as telecare, smart sensors, and digital tools for independent living. These can improve social care reform and support healthy ageing, enabling people to remain in their homes longer. Digital and AI technologies also provide the means to enhance public services more broadly, from healthcare diagnostics to efficiency improvements in service delivery.

As has been detailed, Scotland's strong renewable energy capacity presents an opportunity to position the country as a global leader in sustainable, green data centres.

This would not only reduce the environmental impact of digital infrastructure but also align with Scotland's broader net zero ambitions. Addressing the gap in Scotland's datacentres would likely create additional economic value through market confidence in a resilient and integrated telecoms sector.

From an economic perspective, digital technology innovation has the potential to fuel economic growth, building on Scotland's established clusters in areas such as fintech, software development, and cyber security. Scotland's cities, particularly Glasgow and Edinburgh, already host thriving digital innovation hubs, which can act as catalysts for further technological advancements.

Telecoms and digital are embedded in our lives, therefore ensuring all of Scotland can take advantage of the benefits of these technologies is essential to the wellbeing of our communities, while ensuring the resilience of the sector will require specific targeted action.

Scotland's Infrastructure

Key drivers

Telecoms access and related digital infrastructure has become an essential service for our private and public lives. Therefore, it is unsurprising that it is also influenced strongly by our drivers:

Demographics

Scotland's ageing population and changes in household composition will drive demand for more inclusive and accessible digital infrastructure. As more people live longer, there will be an increasing need for digital solutions to support independent living and healthy ageing. Technologies such as telecare, smart sensors, and remote health and social care services will become vital to meet the needs of an older population. Additionally, younger generations will expect seamless, high-speed connectivity and cutting-edge technologies as standard, further accelerating the need for advanced telecoms infrastructure like 5G and full-fibre broadband. Meeting these demands will require investment in connectivity in urban and rural areas.

Public service reform

The transformation of the public sector, with a focus on digitising services and improving efficiency, will be heavily reliant on robust telecommunications infrastructure. Over the next three decades, digital public services will likely become the default, from online health and social care appointments to automated social care systems. Artificial intelligence, data analytics, and cloud technologies will underpin these changes, enabling real-time decision-making and personalised services. To support this, the telecoms sector will need to ensure resilient, secure, and high-capacity networks, particularly as public services increasingly rely on digital systems. Furthermore, as has been seen to date, public-private partnerships will play a crucial role in delivering the necessary infrastructure and innovation.

Climate change

Addressing climate change is essential for the telecommunications and digital sector. Data centres, which are energy-intensive, will face increasing scrutiny to align with net zero ambitions. Scotland's renewable energy potential positions it as a leading location for green data centres, enabling the telecoms sector to reduce its environmental impact. Additionally, climate resilience will become a critical consideration, with telecoms infrastructure needing to withstand extreme weather events such as flooding and storms. The sector will also play a key role in enabling other industries to reduce emissions through digital tools like smart grids, remote monitoring, and Internet of Things devices, as well as providing heat from energy-intensive operations that could be used by others, offering a potential low cost heating source.

Scotland's Infrastructure

📷 Economic priorities

The digital sector is expected to remain a cornerstone of Scotland's economic growth over the next 30 years. As one of the fastest-growing industries, it will drive innovation and create high-value jobs in areas such as AI, fintech, cybersecurity, and green technology. Scotland's established digital innovation hubs in cities like Edinburgh and Glasgow will likely expand, attracting inward investment and fostering collaboration between academia, government, and industry. Moreover, rural connectivity improvements through initiatives like R100, Project Gigabit, mobile investment and Low Earth Orbit Satellites will help ensure that economic opportunities are more evenly distributed across the country, supporting regional development and reducing the urban-rural divide. The increasing volume of data generated by new technologies will drive the need for robust and resilient data processing and storage solutions, including data centres, to sustain the economic growth potential.

🔒 Global security

Global insecurity, including geopolitical tensions, cyber threats, and supply chain disruptions, will present ongoing challenges for the telecommunications and digital sector. The risk of cyber attacks on critical infrastructure including international subsea fibre cables, will require robust security measures, including investment in advanced threat detection and response systems, as well as enhanced resilience through increased diversity in provision of international sub sea fibre cables. Additionally, geopolitical tensions could impact the availability of critical minerals, key technologies and components, such as semiconductors, necessitating greater resilience and diversification in supply chains. Scotland's role in cybersecurity, already a growing sector, will become increasingly important in protecting digital infrastructure and ensuring continuity of services.

⌲ KEY MESSAGE

The private and public sector need to continue to collaborate to create a resilient sector that sustains economic, social and environmental priorities. This includes addressing gaps in coverage and stimulating greater consumer choice, to support communities and business. Digital inclusion should continue to be a priority for the public sector in driving any direct investment. Solutions with targeted use of available public sector levers are needed to balance ambitions with environmental concerns, in areas such as green datacentres. Innovation should continue to be stimulated, building on existing clusters to generate value to the economy, while developing solutions for an ageing population and evolving public services. Climate, cybersecurity and other global threats require a sustained approach to ensure service resilience and resistance to interference.

Scotland's Infrastructure

Social infrastructure

Housing

Good quality and affordable housing is central to our places, to our lives and the ability to house workers where needed for a thriving economy. Scotland announced a housing emergency in May 2024, alongside 13 of Scotland's 32 local authorities, due to pressures on homelessness services and high levels of people in temporary accommodation.

Some of the reasons driving this situation include: the lack of affordable homes, and other housing options and tenures at sufficient scale such as for sale or private rent; long-term empty homes; changing demographics increasing the number of total households; and social housing supply, reduced through Right to Buy schemes in the 1980s and 1990s, while social housing construction also significantly declined during the same period.

Responsibility for housing policy in Scotland lies primarily with the Scottish Government, which oversees areas such as affordable housing, planning policy, homelessness support, and building standards. Local authorities are however central to the delivery of social housing and strategic planning, assessing local housing needs and providing services for those experiencing homelessness. Housing Associations and other Registered Social Landlords also play a key role in delivering affordable housing for rent or low-cost ownership, while the Scottish Housing Regulator ensures that social landlords meet high standards of service. After a major expansion of private housing landlords between 2000 and 2019 (increasing it's market share from 5% to 15% of total housing stock) there has been recent structural shifts with smaller landlords

stepping away and large institutional investors moving in via Built to Rent and Purpose-Built Student Accommodation. Registers of Scotland manages the land and property registers, a critical part of the administrative framework that underpins the sector. The private sector also develops and builds the housing we need, delivering across different markets and tenures.

2.74m
In 2024 there were 2.74m dwellings in Scotland

4.1%
of dwellings are unoccupied
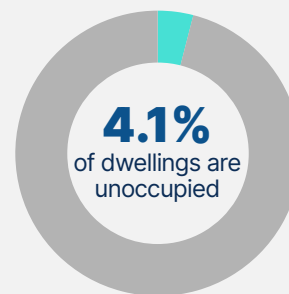
The Scottish Government's Housing to 2040 strategy provides a long-term vision for housing, focusing on delivering a well-functioning housing system with high-quality, sustainable homes and vibrant communities. Complementary policies, such as the National Planning Framework 4, prioritise affordable and rural housing, sustainable

58%
of dwellings fall into Council Tax A-C bands

14%
of dwellings fall into Council Tax F-H bands

locations, and infrastructure-first approaches. Local authorities also develop Local Housing Strategies, tailored to meet specific needs in their areas, and supported by funding mechanisms like the Affordable Housing Supply Programme, Rural and Islands Housing Fund and the Housing Infrastructure Fund. These initiatives aim to unlock housing development, particularly in areas where projects have stalled due to financial or infrastructure challenges.

In 2024 there were 2.74 million dwellings in Scotland, with 4.1% of these unoccupied, including second homes. Council tax, collected by local authorities, gives an estimate of the relative value of property, on a sliding scale of A to H, with H being the most expensive. Scottish Assessors' Association data shows that 58% of dwellings fall into A-C bands and only 14% in the highest bands F-H. The spread of bands varies across Scotland, with East Renfrewshire having 36% in the highest bands compared to only 2% in Eilean Siar.

Scotland's Infrastructure

Scotland's housing stock is diverse, reflecting the country's architectural history and geography.

While rural areas are generally characterised by larger, detached homes, urban regions are dominated by tenement flats and smaller dwellings. Housing quality remains a concern, with nearly half of all homes in some state of disrepair. Scotland offers a variety of housing tenure types, ranging from home-ownership to social housing, private renting, and more specialised options like mid-market rent and supported accommodation. Each type comes with different rights and responsibilities for the occupant and is regulated by specific laws.

⚖️ Opportunities and challenges

As demonstrated by the national housing emergency, housing supply remains a critical issue, with current demand for affordable homes far exceeding supply in most parts of the country. This is illustrated by many local authorities who are managing increasing pressures, including homelessness, and lengthy waiting lists for social housing. In 2023-24, homeless applications reached their highest level in over a decade, with more households and children living in temporary accommodation than ever before.

The number of new homes built annually has fluctuated over the past two decades, with the economic downturn of 2008 and the Covid-19 pandemic causing significant disruptions. In 2024, approximately 20,000 homes were completed, but this marked a 12% decline compared to the previous year. Local authorities and developers face ongoing pressures to deliver new homes, particularly in high-demand areas such as Edinburgh and Lothians, Glasgow, and Fife. Social housing is a key part of the solution, with stock levels steadily increasing since 2018. However, demand continues to outstrip supply, with nearly 250,000 people waiting for social housing as of 2024.

Figure 6: Construction TPI v CPI inflation
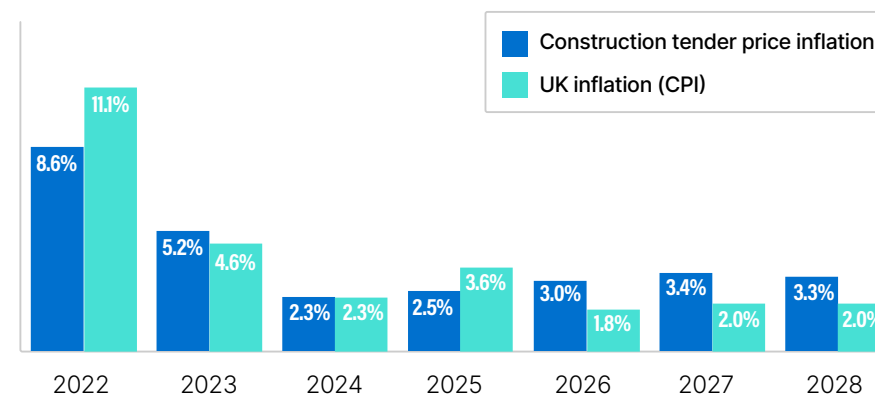
Sources: Construction data – BCIS. CPI – ONS Data; OBR Projection Data.

22,400
Homes built in 2023

20,000
Homes built in 2024

Funding and finance are persistent barriers to addressing shortages, exacerbated further in rural and island areas. These key regions face unique obstacles, including low population density, limited contractor bases and limited infrastructure, which make housing developments less commercially attractive to private developers. Compounding funding and finance issues are the rising costs of construction, maintenance, and repairs, which place additional strain on both public and private housing providers. Housing affordability for the tenant is another problem, with rising costs making it difficult for many to access alternative secure and suitable homes.

The housing sector is also facing climate challenges, both in terms of resilience to climate impacts, but also in decarbonising heat. The scale of the challenge, including investment required to support ambitions, is significant.

> To meet Scotland's net zero targets, a large-scale retrofit of the existing housing stock is necessary to improve energy efficiency and decarbonise heat.

33%
One third of households are unable to afford adequate heating

Alongside the climate imperative, fuel poverty is a growing concern, with over a third of households in 2023 unable to afford adequate heating, a problem that is particularly acute in less energy-efficient homes. However, the financial barriers to retrofitting housing to meet climate and energy efficiency priorities remain significant.

> Investments in energy performance have however already yielded results, with more than half of Scottish homes achieving an Energy Performance Certificate rating of B or C in 2023, a real improvement from a decade ago.

However, there is more work to be done, particularly for Scotland's heritage and off-grid properties. Additionally, climate change poses growing risks to housing, particularly flooding, which requires investment in resilience measures. This includes balancing the demand for more housing with the risk of developments in vulnerable areas without adequate long-term protections.

While reducing over time, second homes, particularly in rural and island areas, further exacerbates the housing shortage. Empty

property statistics are problematic due to changing methods of collating data, making this a more nuanced issue. While properties empty for more than 6 months increased by 184% between 2005 and 2024, many of these have exemptions due to awaiting demolition, or a new build to allow occupation. This highlights both a challenge in scale but also an opportunity in better use of existing housing stock. Linked to this is the opportunity of re-using and re-purposing above ground floor spaces, surplus land and asset, such as offices and public sector buildings.

164,000
sites across Scotland hold planning permission but remain undeveloped

Despite strong demand, the process of delivering housing is often slow, with over 164,000 sites across Scotland holding planning permission but remaining undeveloped. Beyond making the investments work financially, many of the delivery issues are exacerbated by system challenges. These include barriers around land availability, legislative and regulatory considerations, alongside workforce skills and availability, each adding further complexity.

> While these challenges are significant, Scotland's housing sector has equally significant opportunities to innovate and adapt.

Scotland's Infrastructure

Innovation in procurement and delivery models could address some of the sector's financial and logistical challenges. Methods such as off-site construction can reduce building costs and accelerate the delivery of new homes, as could aggregation and collaboration on delivery. The recently developed Regional Delivery Alliance in the south-east of Scotland, supported by SFT, which groups several local authorities and increasingly some housing associations, is beginning to demonstrate the benefits of collaborative working arrangements, aggregating demand and streamlining product design. Additionally, reusing or repurposing vacant or under-utilised properties and assets presents a cost-effective way to increase housing availability, particularly in areas with high numbers of long-term empty properties. This also has potential to contribute to the climate change agenda through re-using the embodied carbon contained in existing buildings.

Scotland has a strong tradition of community-led development, which offers an opportunity to build resilience in remote and rural areas.

> By empowering communities to take an active role in housing delivery, localised solutions can be developed to address specific needs.

This approach can support place resilience, helping to sustain rural populations and combat issues such as depopulation and economic decline.

Legacy investments from major infrastructure projects, such as renewable energy developments

in the Highlands & Islands and the South of Scotland, could also be leveraged to support the construction of high-quality affordable homes. From an economic perspective, strategic housing sites represent significant opportunities for development, which can support Scotland's broader economic growth. Major housing projects can create jobs, attract investment, and stimulate local economies, particularly when aligned with national economic priorities.

> Additionally, investment in affordable and sustainable housing has a ripple effect, supporting industries such as construction, renewable energy, and technology.

Recent developments by SSEN, to deliver legacy worker housing illustrates this opportunity.

Beyond addressing supply, digital technologies offer a transformative potential for housing management. Predictive analytics can enable proactive maintenance, reducing costs, improving efficiency, and enhancing tenant satisfaction. Comprehensive asset management systems could provide real-time data on property conditions, facilitating timely interventions and better resource allocation. Alongside this, smart home technologies, such as sensors and telecare systems, can support independent living for older people and improve energy efficiency. These digital innovations, combined with a focus on inclusivity and accessibility, will be crucial in meeting the needs of Scotland's ageing population and growing number of smaller households.

Scotland is experiencing a national housing crisis, with a housing shortage, rising costs, and fuel poverty challenge, while it also seeks to mitigate climate change, including adapting to increasing risks. Addressing these issues while exploiting industry opportunities will require collaboration across government, industry, and communities, with stakeholders using all the levers at their disposal.

Scotland's Infrastructure

Key drivers

Reflecting this complexity, many of the drivers will also continue to affect the housing sector:

Demographics

Scotland's ageing population and changing household compositions will significantly impact the housing sector. The number of single-person and smaller households is expected to continue rising, driven in part by an ageing population that increasingly prefers to live independently at home rather than in communal care settings. This will create a growing demand for smaller, accessible homes designed to support independent living, with features such as step-free access, smart home technology, and proximity to health and social care and community services. Meanwhile, younger households and evolving family structures, will continue to require affordable options, including social housing and low-cost home-ownership. These demographic shifts will necessitate a diverse and flexible housing stock capable of meeting the varying needs of Scotland's population.

Public service reform

The public sector is undergoing a digital transformation, with greater reliance on technology to deliver efficient and effective services. Over the next 30 years, this shift will influence how housing services are managed and delivered, particularly in the social housing sector. Digital tools and data analytics will enable local authorities and housing associations to manage housing stock more efficiently, improve maintenance through predictive analytics, and enhance tenant satisfaction by addressing issues proactively. As digital is an essential ingredient in our daily lives, our homes will need to be adapted to integrate digital systems. Smart home technologies and devices will support broader public sector ambitions to support greater independent living, particularly for older residents.

Climate change

Climate change will have profound implications for the Scottish housing sector, both in terms of mitigation and adaptation. Scotland's commitment to achieving net zero by 2045 will require large-scale retrofitting of the existing housing stock to improve energy efficiency and reduce carbon emissions. However, the financial and logistical challenges of retrofitting millions of homes will require innovative funding mechanisms and coordinated efforts across government, industry, and communities. Re-use and re-purposing of assets for housing will support the re-use of embodied carbon. In addition to reducing emissions, the housing sector will need to adapt to the physical impacts of climate change, such as more frequent flooding and extreme weather events. New developments will need to incorporate climate-resilient designs and infrastructure, while existing homes in high-risk areas may require significant investment to protect them from flooding and other climate-related risks.

Scotland's Infrastructure

💳 Economic priorities

Housing will remain central to Scotland's economic priorities, driving inclusive growth, job creation, and regional development. Major housing projects, particularly in strategic sites, will stimulate the construction industry and support supply chains, contributing to national and local economies. Investment in affordable housing and enabling infrastructure will also help address inequalities by providing secure and stable homes, enabling individuals and families to participate more fully in the economy. In rural and island areas, housing will play a critical role in supporting population retention and economic sustainability. The delivery of high-quality, affordable homes in these regions will help combat depopulation and support local industries, stimulating future economic growth across a number of key sectors. While retrofit of homes is likely to create economic opportunities across Scotland, creating place-based employment. Addressing skills and capacity of the housing sector to support necessary housing supply will be an important element of achieving economic priorities.

🔒 Global security

Global insecurity, including economic volatility, geopolitical tensions, and related supply chain disruptions, will present challenges for the housing sector. Rising construction costs, driven by inflation and supply chain issues, could slow the delivery of new homes and increase the financial pressures on developers and housing providers. Additionally, global energy market instability may exacerbate fuel poverty, particularly for households in older or less energy-efficient homes. Cybersecurity threats will also become increasingly relevant as housing providers adopt more digital technologies and homes utilise more smart devices. Protecting tenant data and ensuring the resilience of digital systems will be critical to maintaining trust and avoiding service disruptions. On a broader scale, global migration driven by conflict, climate change, and economic instability may increase pressure on Scotland's housing stock, particularly in urban areas, requiring proactive planning and investment.

⌕ KEY MESSAGE

The public and private sector need to enhance collaboration to address housing challenges including the housing emergency, to create a resilient sector that addresses current and future needs of the population. Social and affordable housing needs to be a strong component of supply, recognising the sustained cost-of-living problems. While a continued focus on re-use and re-purposing of assets should be part of the mix, supporting climate and regeneration ambitions. Addressing emissions from heat in residential buildings will require innovation in financing and delivery, particularly in heritage buildings. Scottish Government and industry leadership is needed to drive action to address system challenges such as land availability, legislative and regulatory barriers as well as availability of construction workforce skills. Action should build on successes such as aggregation and collaboration on delivery and is likely to require targeted solutions in different locations. New homes need to be future-proofed for a changing demographic, with expectation of increased technology for everyday life, as well as to facilitate independent living for an ageing population.

Scotland's Infrastructure

Health and social care

Healthcare is the Scottish Government's largest area of spending, with £19.1 billion, or 40% of the total 2024-25 Budget allocated to health. This reflects the importance of the sector and the continued growth in service demand, driven in part by an ageing population and continued post-pandemic backlog alongside other factors.

£19.1bn
Healthcare is the Scottish Government's largest area of spending

40%
of 2024/5 budget
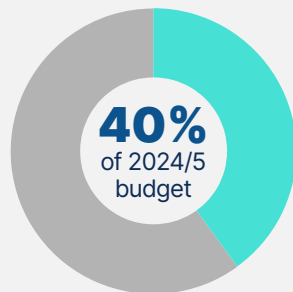
This demand is putting pressure on services, assets and the workforce, as well as the public purse and is only anticipated to increase. In the face of these challenges, the NHS is driving a reform agenda that mirrors other aspects of the public sector, including a focus on prevention and service efficiency.

The health sector in Scotland is dominated by the public sector, with the Scottish Government setting healthcare policy and legislation while NHS Scotland delivers frontline services including improving population health. NHS Scotland consists of 14 territorial boards overseeing regional health services and seven special boards that provide national support. The NHS works alongside agencies such as Public Health Scotland which has a focus on addressing Scotland's

health challenges, particularly in reducing health inequalities and improving public health outcomes. Health and Social Care Partnerships integrate health and social care services across 32 local authorities, while local councils retain statutory responsibility for social care.

> The integration of health and social care was a significant evolution in recent years, alongside a shift towards community care and improving service quality and patient experience.

Alongside these bodies, The Scottish Government's Digital Health and Care Division works with various partners to deliver innovative digital solutions that meet the evolving needs of the population. Additionally, several regulatory organisations, including Healthcare Improvement Scotland, the Care Inspectorate, and the Scottish Public Services Ombudsman, ensure that healthcare services meet high-quality and safety standards. Professional regulatory organisations, such as the General Medical Council and General Dental Council, oversee the regulation of healthcare professionals.

Scotland's health strategy is guided by a range of frameworks and plans, including the Population Health Framework and the Health and Social Care Service Renewal Framework, both launched in 2025. Reflecting wider public service

reform priorities, these strategies represent a shift towards preventative care, a whole-systems approach to health, and tackling health inequalities. The Digital Health and Care Strategy (2021) underlines Scotland's commitment to integrating digital technologies into health and social care delivery to enhance accessibility, efficiency, and citizen empowerment.

£7bn
NHS assets were valued at £7 billion in 2017

NHS Scotland operates a vast and complex infrastructure system, with physical assets valued at over £7 billion (2017), including land, buildings, medical equipment, vehicles, and IT systems. Major capital investments in recent years have included the Dumfries and Galloway Royal Infirmary and the Royal Hospital for Sick Children and Department of Clinical Neurosciences in Edinburgh.

The NHS is significant in its role in society, reflected in both annual budgets and scale of assets. As we will discuss, it is however facing several challenges, which are influencing its reform ambitions, aligned to the broader public service reform agenda. This includes a focus on prevention which is likely to drive a different type of asset, relying on greater digital infrastructure and services in the medium-longer term.

Scotland's Infrastructure

⚖️ Opportunities and challenges

Scotland's health sector faces a range of challenges from financial barriers, health inequalities, an ageing asset base, to both a rising and changing demand on services. While a valued public service, these issues are affecting public confidence in the NHS.

Financial pressures are being felt across the public sector, with some consistency around rising inflation and higher energy costs. The health sector is also facing ongoing pay demands within the workforce, rising demand on services affecting finances and the further financial pressure of an ageing infrastructure base.

£8.5bn
the estimated cost to replace Scotland's ageing healthcare and hospital facilities

Many of Scotland's hospitals and healthcare facilities are nearing the end of their economic life, with the estimated cost to replace these ageing assets £8.5 billion. Reinforced Autoclaved Aerated Concrete (RAAC) is an area of ongoing monitoring across the public service estate, contributing to this challenge. Major capital projects, such as the development of new hospitals, have been paused due to funding constraints, delaying much-needed upgrades and the modernisation of health and social care infrastructure. This is however complicated by the expectation that service delivery models will continue to evolve and therefore medium-long term asset needs are likely to be different than those in the shorter term. Understanding how to manage the impacts of reform on the asset base while addressing infrastructure shortfalls is a difficult balance. Asset flexibility is central to this management including better utilisation and the life extension of existing assets.

Like many public services, climate change also poses risks to the sector, including the need to make healthcare facilities more resilient to extreme weather events and to reduce carbon emissions across the NHS estate.

> The shift to net zero requires significant investment in energy-efficient infrastructure and sustainable practices at a time when finances are already constrained.

Demand for services continues to rise in some key areas. While the number of hospital admissions has decreased, the average length of stay has increased, adding pressure to hospital capacity and creating inefficiencies in the system. Discharge delays, or "bed blocking," remain a persistent issue, reducing the availability of beds for new patients and straining resources. Moreover, waiting times for both outpatient and inpatient treatments have risen significantly since the Covid-19 pandemic. The ageing population further exacerbates demand on health and social care services, requiring more resources and innovative models of care to meet the needs of older adults.

Alongside demand challenges, health inequalities and improving access to care continue to be problems for the health sector. Scotland experiences significant health inequalities, with deprived communities disproportionately affected by poor health outcomes.

> Additionally, there has been a stall in life expectancy improvements, reflecting the persistence of underlying socio-economic disparities that impact the nation's overall health and well-being.

Efforts to join up services to support better outcomes such as health and social care integration while considered positive have not fully addressed issues.

Non-infrastructure concerns create additional pressures, such as workforce challenges, including workloads, recruitment and retention issues and pay demands. Workforce deployment and availability are likely to impact on service and therefore infrastructure design.

These challenges are not insignificant; however, Scotland's health sector equally has opportunities to transform and innovate. For example, digital technology presents an opportunity, both in efficiency but in improving

Scotland's Infrastructure

delivery models. The implementation of a national digital platform could enable secure and seamless sharing of real-time data from health and care records, improving coordination and decision-making across the system.

> Digital tools also have the potential to enhance service delivery, from enabling remote consultations and telehealth to providing citizens with greater control over their health through self-management apps and wearable devices.

These innovations could help alleviate pressure on physical health and social care facilities and improve accessibility for patients in remote or under-served areas. With their accessibility they also have the potential to support behaviour change, encouraging greater personal control of health outcomes.

The shift towards a preventative, integrated and accountable health and social care system as outlined in the Population Health Framework, offers a system-wide opportunity to improve public health outcomes. By aligning services and improving collaboration between the NHS, local authorities, and social care providers, Scotland can ensure that individuals receive the right care in the right place. This approach furthers the focus on shifting the balance of care towards the community, reducing reliance on acute hospital services. Community-based care models not only improve patient outcomes but also help to alleviate pressures on hospitals, making the system more sustainable in the long term.

> Investment in workforce development is also crucial.

By improving training and career pathways, particularly in rural areas, Scotland can address workforce shortages and ensure that health and social care services remain accessible to all.

Alongside long-term reduction of costs through many of these opportunities, the financial barriers are likely to require greater partnerships between the public and private sectors, to unlock new funding mechanisms and accelerate the delivery of vital infrastructure projects.

Scotland's Infrastructure

Key drivers

Health is integral to our wellbeing and health services are a prominent aspect of our communities and its infrastructure. The drivers we have identified will continue to impact on infrastructure need:

👥 Demographics

Scotland's changing demographics are already impacting on demand. The proportion of older adults is expected to increase, leading to a rise in age-related conditions. This demographic shift will place considerable pressure on health and care services, particularly in primary care, social care, and community-based services. There will also be an increased demand for end-of-life care and long-term support for older adults, requiring a shift in service delivery models. Short term population increases are likely to also affect demand, while at the same time, changing household compositions, including a rise in single-person households, will require the health and social care system to adapt to the needs of individuals who may lack informal family support. The movement of our population is another nuance to this, with traditional assets no longer where needed.

🏛 Public service reform

The health services provides potential opportunity for public service reform, with an increasing focus on efficiency, accessibility, and integration of services. Within the next three decades, it is anticipated that the health and social care landscape will continue to shift towards a more integrated model, improving organisational and system coordination between NHS services, local authorities, and third-sector organisations. This approach will prioritise delivering care closer to home, reducing hospital admissions, and addressing the root causes of ill health through preventative measures. Advancements in data and technology has the potential to revolutionise the Scottish health sector, with improvements in service delivery, patient outcomes, and system efficiency. Digital health technologies, such as telemedicine, mobile health apps, wearable devices, and remote monitoring, will enable patients to manage their health more effectively and reduce reliance on in-person care. With the financial constraints, policy changes will also likely reflect an emphasis on allocating resources to achieve the best possible outcomes for patients. Every infrastructure investment decision will be an important reform opportunity, with maintenance more essential where there is low opportunity for system change, while new investment is more viable where opportunity for change is high.

⛅ Climate change

Climate change will have implications for Scotland's health sector, both in terms of reducing its environmental footprint, and in adapting to its physical and public health impacts. The push towards achieving net zero by 2045 will require major changes in the operation of health and social care services, reducing emissions through energy efficiency measures and integration of low carbon energy sources. The transition to more sustainable health and social care practices will also involve reducing waste, increasing the use of green technologies, and promoting sustainable procurement across the sector. The health sector will need to ensure that its facilities and infrastructure are resilient to climate risks, through investment in climate adaptation measures. Extreme weather events, such as flooding and heatwaves, will likely also increase demand for emergency and public health services, particularly for vulnerable populations such as older adults, children, and those with pre-existing health conditions.

Scotland's Infrastructure

📷 Economic priorities

Health and social care will remain a cornerstone of Scotland's economy over the next 30 years, both as a major area of public spending and as an enabler for economic growth. The health sector supports thousands of jobs across the country, from frontline health and care professionals to those working in research, innovation, and pharmaceutical manufacturing. Continued investment in the health sector will not only address growing health and care needs but also support economic priorities by creating skilled jobs, fostering innovation, and attracting investment. Innovation in health data and technology will create further market opportunities, as health and care is brought closer to home. Rural and remote areas will require particular attention, as the availability of health and care services is critical for sustaining local economies and preventing depopulation. Investment in health and care in these regions will help to support community resilience and ensure that all Scots have access to high-quality care, regardless of location.

🔒 Global security

Global insecurity, including geopolitical tensions, economic instability, and pandemics, will pose ongoing risks to Scotland's health sector. The Covid-19 pandemic highlighted the vulnerabilities of health and care systems to global health crises, and lessons learned from that experience will shape future planning and preparedness. Strengthening public health systems, appropriate stockpiling of essential medical supplies, and building capacity for rapid response to emerging health threats will be key priorities. Economic instability and disruptions to global supply chains may also impact the availability of medical equipment, pharmaceuticals, and other essential health and care resources. Ensuring supply chain resilience and promoting domestic manufacturing of critical items will be important strategies for mitigating these risks. Additionally, global migration driven by conflict and climate change may increase demand for healthcare services in Scotland, requiring careful planning to meet the needs of a more diverse population.

⬊ KEY MESSAGE

With increasing demand and pressure on ageing assets, the health sector requires significant focus by Scottish Government and its agencies to be fit for the future, while being affordable. Public service reform is driving new models of service delivery that will require careful management of current assets at the end of their life and not climate-ready, while models and infrastructure are developed. Managing growing demand, including the needs of an ageing population, will require a greater emphasis on prevention across a more integrated public service system, while supporting changes in behaviours by individuals. Addressing affordability barriers through greater public private partnerships may be necessary, unlocking funding mechanisms and accelerating the delivery of critical health infrastructure. Considering the sector's resilience to global shocks should continue to be part of long-term planning, including cyber security as technology becomes more essential to service delivery.

Scotland's Infrastructure

Connect Me

Scotland's national remote health-monitoring service, improving access and freeing up appointments.

Connect Me is a Scotland-wide digital health service that enables people to submit health measurements and questionnaires from home via app, web, text messaging, or automated phone, reducing digital exclusion.

Designed to ease pressure on primary care, it shifts routine monitoring, especially blood pressure, from clinics to homes while maintaining clinician oversight through standardised national pathways.

Since 2019, it has supported over 100,000 people and avoided more than 400,000 appointments.

Funded by the Scottish Government and delivered through NHS Boards and GP practices, the service uses a common technology platform and consistent workflows. Strong evidence of impact supports continued investment and planned expansion.

> Connect Me is another example of how we're embracing technology to help tackle the challenges facing health and social care. By empowering patients to take control of their wellbeing we are not only improving health outcomes but also significantly reducing pressure on primary care services.
>
> NEIL GRAY, CABINET SECRETARY FOR HEALTH AND SOCIAL CARE, SCOTLAND

LOCATION: Scotland Wide

STATUS: Current ●

🔊 **DATA AND TECHNOLOGY**

Scotland's Infrastructure

Education

The education sector in Scotland is a vital part of our societal and economic infrastructure, encompassing early years education, primary and secondary schooling including independent schools, further and higher education, and Community Learning and Development.

Despite substantial investment and progress in recent years, the sector faces challenges related to funding, infrastructure, demographic changes, and the evolving needs of learners, while also benefiting from opportunities to innovate and modernise.

The Scottish Government is responsible for the education system, setting national education policy and funding alongside Education Scotland the executive agency which supports quality and improvement. There are several other responsible agencies, including local authorities that have the statutory role for delivery of early years in partnership with private providers and the Care Inspectorate, and primary and secondary state school education. CoSLA (Convention of Scottish Local Authorities) is a key partner in implementing education reforms, including plans to replace the Scottish Qualifications Authority with a new body, Qualifications Scotland, and to create a new independent inspectorate.

>5,000

There are over 5,000 early learning centres and state schools in the school estate

Scotland's colleges operate as independent institutions, funded in part by the Scottish Government through the Scottish Funding Council (SFC), the further and higher education regulator, while universities are fully independent and while they also receive SFC funding, can charge fees. The college sector is organised into 13 regions, delivering skills-based education and preparing students for employment or further studies, while universities are represented by Universities Scotland and cater to a diverse student body, including a growing number of international students.

The early learning and school estate is significant, including 2,575 early learning and childcare centres and 2,500 state schools, as well as 91 independent schools. Early learning centres (ELC) are delivered by a mix of public and private bodies and receive funding for 3-4 year olds to access 1140hrs of support per year. The number of ELC centres has decreased slightly in recent years, alongside a decline

Scotland's Infrastructure

63%
Schools were good/satisfactory in 2007

92%
Schools were good/satisfactory in 2025

in the number of children registered for ELC, reflecting wider demographic trends. While local authorities manage the school estate, Scottish Government and local authorities jointly announced £2 billion of investment for 47 projects through the Learning Estate Investment Programme between 2019 and 2023; and before that £1.8 billion between 2009-2021, covering 117 projects through Scotland's Schools for the Future Programme. As of 2025, 92% of schools were in good or satisfactory condition, a major improvement from 63% in 2007.

There are 24 colleges, which are public bodies delivering skills-based learning to approximately 218,000 students annually. They also act as pathways to university for around 9,000 students each year. Since 2007, £800 million has been allocated to the college sector alongside £300m in Non-Profit Distributing revenue funded investments, and a further £741 million invested in 2021-22 by Scottish Funding Council. There

£179m
invested in the university estate by Scottish Government between 2011-21

are 19 higher education institutions including 15 universities which are autonomous non-profit charities. Between 2011-2021 Scottish Government invested £179m in the university estate which in 2019 was valued at £5 billion. Scotland's universities attract large numbers of overseas students, with 65,000 international students in 2023-4 out of a total 184,735. It is projected that these international students have contributed between £4-6 billion to the economy since 2019.

35%
In 2023/4, 35% of students at Scottish universities were international students

Scotland's education system is guided by several key policies and strategies designed to enhance learning outcomes, equity, and infrastructure. The Education (Scotland) Bill (2024) proposes significant reforms, including the establishment

of Qualifications Scotland and a new Chief Inspector of Education. Other policies, such as Delivering Excellence and Equity in Scottish Education (2016) and the Scotland's Learning Estate Strategy (2019, refreshed 2025), aim to promote high-quality education, reduce attainment gaps, and ensure that learning environments are inclusive, safe, and sustainable. The Scotland's International Education Strategy (2024) focuses on enhancing the country's global reputation as a leader in education and research, facilitating Scotland's universities and colleges to become hubs for knowledge exchange.

Scotland's Infrastructure

⚖️ Opportunities and challenges

The Scottish education sector faces varied challenges that could impact its ability to deliver high-quality, equitable learning experiences, while delivering value for the public purse. However, there are significant opportunities to innovate, reform, and build on Scotland's historical strengths in education, leveraging data, technology, and forward-looking policies to enhance outcomes for learners of all ages.

17%
College funding has reduced by 17% since 2021-22

Parts of the education system are under financial pressure, such as the colleges sector which has seen real term funding reduced by 17% since 2021-22, creating challenges in maintaining services, modernising infrastructure, and supporting students. Financial constraints are also limiting investment in areas such as staff development, digital technologies, and resources for learners. Achieving Scotland's public sector net zero targets will require investment in the learning estate. Many schools, colleges, and university buildings are older and require retrofitting or modernisation to improve energy efficiency and sustainability. Balancing the need to reduce emissions with limited budgets presents a significant challenge for education authorities and institutions. The changing demographic, both the reducing number of children and changing population distribution will impact on the school estate in particular, creating sustainability issues in some areas and capacity issues in others.

There remain a range of opportunities in developing an education sector fit for the future. Scotland's digital infrastructure provides an excellent foundation for leveraging technology to enhance education. Digital tools, such as online learning platforms, adaptive learning technologies, and data analytics, can personalise learning experiences, improve engagement, and support learners who face barriers to traditional education. The integration of technology into teaching and learning also offers opportunities to improve access to education for rural and remote communities, ensuring a more equitable system.

> Technology also has the potential to create new education pathways, managing the scale of traditional assets required, particularly where no longer fit for purpose and costly climate adaptation is a challenge.

For non-infrastructure issues, the current programme of education reform provides a roadmap for improving the system. These reforms aim to build on the strengths of Scotland's education system while addressing areas of under-performance. Key initiatives include the creation of Qualifications Scotland, a new education inspectorate, and a national skills planning process to ensure that education aligns with Scotland's economic and workforce needs. These reforms have the potential to modernise the education system offering and quality and better prepare learners for the challenges of the future.

The Scottish education sector has an essential role in society, however faces financial pressures, demographic shifts and a need to modernise infrastructure to reflect changing educational approaches and meet net zero targets. However, the sector also has significant opportunities to innovate and reform. Through strategic investment, collaboration, and innovation, Scotland can continue to build on its reputation as a leader in education, ensuring all of Scotland benefits from a strong education system. The learning estate has a role to support these ambitions.

Scotland's Infrastructure

Key drivers

As with other social infrastructure sectors, the key drivers will impact on what infrastructure we need:

👥 Demographics

Scotland's ageing population and declining birth rates will impact across the education sector, reducing demand in early learning and schools however may create opportunities within lifelong learning for an ageing workforce. Rural and remote areas are likely to face the greatest challenges, as smaller populations may make it difficult to sustain local schools and further education facilities, while population distribution may mean across the country infrastructure is no longer where it is needed. At the same time, adults will need to upskill and reskill to remain competitive in an evolving labour market, creating opportunities for colleges, universities, and other education providers. This shift will also require greater integration of education with employment and skills development initiatives to meet the needs of an ageing workforce.

🏛 Public service reform

The public sector is evolving, with a growing focus on efficiency, equity, and collaboration. In the education sector, this will involve further integration of services, and reforms aimed at improving quality and reducing inequalities. Technology including digital tools and platforms will have a key role in driving some of these improvements, impacting on the balance of assets to deliver a quality service. Online learning, hybrid models, shared physical spaces between education institutions and public services, and virtual classrooms may be useful strategies in appropriate circumstances, making education more flexible and accessible, particularly for learners in rural or remote areas. Data and technology will also enable more personalised and adaptive approaches to education, while supporting efficiency in resource management, maximising outcomes.

☁ Climate change

Climate change will have implications, particularly in terms of infrastructure and curriculum development. To meet Scotland's net zero targets, investment will be required to retrofit and modernise the learning estate, while the estate will need to develop and adapt to respond to increased risks such as flooding and higher temperatures. Balancing estate investment with new delivery models including the use of technology may help manage the investments needed. In addition to infrastructure changes, climate change will influence the curriculum, with sustainability and environmental awareness important to drive behaviour change, while vocational skills to develop a skilled workforce in green technologies will also continue to be essential.

Scotland's Infrastructure

Economic priorities

Scotland's education estate provides a focus in our communities, attracting local investment and commerce. The investment needed to maintain and improve assets to make them fit for the future, create opportunities for community wealth building and broader supply chain development.

Global security

Global insecurity, including geopolitical tensions, economic instability, and pandemics, will present ongoing challenges. The Covid-19 pandemic highlighted the vulnerabilities of traditional education systems and accelerated the adoption of digital and remote learning. Resilience to external shocks needs to be hard-wired into our education system. Global shocks may influence immigration policies, impacting the ability of universities to attract students and staff from abroad, requiring effective strategies to remain competitive.

KEY MESSAGE

Scottish Government and local authorities will need to collaborate to respond to the needs of a changing demographic and evolving models of service delivery, likely to impact on early years and state school education infrastructure requirements. Solutions such as shared physical spaces between educational institutions and public services, will support integration of services and sustainability of institutions facing declining numbers. Reducing building related emissions and making buildings resilient to climate impacts will require a continued focus, a challenge to the public purse. Investment in new technologies to support teaching remotely where appropriate, or in delivery of technology-based courses will be important to ensure equity of access and to stay competitive. Resilience to external shocks will be essential, to ensure the education system remains competitive and is able to operate effectively, considering both student wellbeing and service efficiency.

Scotland's Infrastructure

Emergency services

Scotland's emergency services play a critical role in safeguarding the public and responding to a wide range of incidents. They include Scottish Ambulance Service, Scotland Fire & Rescue Service (SFRS), Police Scotland, HM Coastguard, The Royal Lifeboat Institution, Scottish Charity Air Ambulance and Scotland's Mountain Rescue.

We will mainly discuss the core services of SFRS, Scottish Ambulance Service and Police Scotland, although it is clear there is a broader range of valuable assets and services within this sector. These services aim to reduce harm, increase safety, and adapt to evolving community needs. However, they face significant challenges, including ageing infrastructure, backlog maintenance, rising and changing demand on services, and financial pressures, which require strategic approaches to ensure long-term sustainability and effectiveness.

Police Scotland

| 13 divisions | 200 buildings | 23,000 staff | £478m infrastructure |

Police Scotland is the second largest police force in the UK with the remit to ensure the safety and wellbeing of communities across Scotland. Operating in all 32 local authority areas, with 13 local policing divisions, it has over 200 operational buildings, 80% of which they own; and is supported by more than 23,000 staff. Along with related infrastructure, assets have a projected value of £478 million. Recent significant investments include the 2014 Scottish Crime Campus, a multi-agency hub, it enables collaboration for more than 20 agencies, including Police Scotland, with an investment of £75 million. Police Scotland is supported by the Scottish Police Authority, which oversees its governance and continuous improvement. The service received £1.6 billion of funding in 2024-25, including an allocation to drive reforms. The Joint Strategy for Policing (2023-26) identifies five priority outcomes in response to the changing face of crime. Infrastructure priorities include an increase in local policing presence co-located with partners, a priority also emphasised in the 2019 Estate Strategy. An emerging national estate masterplan is currently being developed.

There are currently more than 60 shared facilities with partners, supporting more sustainable and modern workspaces, achieving financial savings and greater public service integration to improve outcomes.

SFRS is the largest fire service in the UK and the fourth largest globally, with a focus on prevention, protection, and emergency response. It operates 356 fire stations, which include volunteer stations, and is supported by over 7,700 staff.

The service oversees a diverse range of assets, including 1,620 vehicles and a property portfolio valued at £500m.

Scotland Fire & Rescue Service

| 356 fire stations | 7,700 staff | 1,620 vehicles | £500m property |

The Scottish Government provided a financial allocation of £412.2 million for 2025-26, up 4.78% from the previous year. The draft strategy for 2025-2028 outlines plans to adapt to changing risks, including increased flooding and wildfires, and improve the suitability and sustainability of its estate.

Scottish Ambulance Service is part of NHS Scotland, and provides emergency and non-emergency healthcare services, including accident and emergency response, patient transport, air ambulance support, and critical care retrievals. It employs over 5,700 staff and operates at least 135 ambulance stations and numerous co-locations with other emergency services and NHS bodies, along with a fleet of ambulances, helicopters, and fixed-wing aircraft. Its assets are valued at approximately £130 million, with transport equipment accounting for the largest share. The service received

Scotland's Infrastructure

Scottish Ambulance Service

5,700
staff

135
ambulance stations

£130m
assets

£437.2 million of funding in 2025-26. The service is expanding its capacity through recruitment, new vehicles, and the establishment of 10 additional locations (9 of which are co-located with SFRS). The service strategy to 2030 highlights the public reform agenda in healthcare we have already discussed, including bringing services closer to the individual and focusing on prevention.

> A key strategy across emergency services is the co-location of facilities to improve efficiency, reduce costs, and deliver integrated public services.

Over 60 co-locations have been implemented, supporting collaboration between agencies.

Scotland's emergency services play a vital role in ensuring public safety and wellbeing, however as we will see they face significant challenges related to ageing infrastructure, rising demand, and financial constraints. Strategic investments, estate modernisation, and closer collaboration between services will be essential to meet current and future needs.

Scotland's Infrastructure

⚖️ Opportunities and challenges

There are a number of consistent challenges within emergency services: service budgetary constraints and capital to address an ageing estate; often-times limited system integration undermining delivery of services; climate change impacting on type of services for SFRS; increasing demand due to population vulnerability, alongside more complex cases; and for the police, rising crime against officers and the type of crime changing.

One of the foremost challenges is funding and financial pressures. This is particularly pronounced in the context of ageing infrastructure and the backlog of maintenance required for Police Scotland and the SFRS.

£245m
Backlog in Police Scotland maintenance costs

There is an estimated £245 million backlog in Police Scotland maintenance costs dominated by properties built before 1980, while the estate does not fully align with modern policing needs. Similarly, 60% of SFRS buildings are more than 30 years old, and 45% of operational properties are in poor or bad condition. Many stations lack basic facilities such as adequate toilets and showers. Audit Scotland has highlighted a significant capital backlog for SFRS, with at least £60 million required annually to maintain operations. Some stations are however in

60%
SFRS buildings are over 30yrs old

45%
of properties are in poor or bad condition

areas where heavy industry has declined, necessitating a re-evaluation of their location and purpose. SFRS undertook a 12-week public consultation in 2025 on its Service Delivery Review which looks at ways to reshape and modernise the organisation, including consideration of the location of stations.

55%
Demands for ambulance services has risen by 55% in the last decade

While the ambulance service is not experiencing the scale of asset ageing as other aspects of the sector, it is seeing significant demand on services which may influence asset needs over time and already has financial implications. Demand for ambulance services has risen by 55% over the past decade due to an ageing population, more complex medical cases, and increased referrals from GPs. Hospital handover delays have also placed additional pressure on resources.

Alongside an ageing population, this complexity of cases seen by the ambulance services is also impacting on other emergency services. For the police while this may not impact immediately

on crime, which is low in Scotland, it is affecting the interaction with communities and the use of policing services.

Police and SFRS are also seeing a change in the types of issues they need to respond to, with cyber crime requiring a different policing response, while climate change is affecting the types of emergencies that SFRS is responding to, such as rising wildfires and flooding. A concerning trend for Police Scotland is also the increased crime against officers, undermining their ability to undertake their role effectively.

> The sector has been modernising however, creating opportunities to address challenges.

Estate management issues are being considered at national, regional and local level, with an increased focus on co-locating of services, creating more sustainable and integrated facilities. Co-location also supports estate rationalisation, reducing the number of ageing assets. Importantly it also has the potential to address the growing complexity of social challenges emergency services are facing. Beyond co-location, other opportunities include leveraging data and technology, including data science, to understand demand and create more responsive and integrated services, while also addressing changes such as the rise in cyber crime.

Scotland's Infrastructure

Key drivers

Again, many of the drivers we have identified will affect how our emergency services must adapt to deliver effective and efficient services, fit for the next 30 years:

👥 Demographics

An ageing population is more likely to require health and care services and emergency assistance. This shift is already placing additional pressure on the Scottish Ambulance Service; however the complexity of medical cases is also likely to increase, requiring investment in specialist training and equipment. In addition, population growth in urban areas and population decline in rural communities may lead to uneven demand for emergency services. Urban areas may require more resources to cope with higher call volumes, while rural and remote areas will need targeted solutions, such as enhanced air ambulance coverage or digital consultation tools, to ensure equitable access to services. Emergency services will also need to adapt to increasing diversity in Scotland's population. All services will need to engage effectively with diverse communities to build trust and ensure inclusivity in service delivery.

☀️ Climate change

Climate change is already altering the nature of incidents faced by emergency services in Scotland, and its impacts are expected to intensify. The SFRS will need to respond to a growing number of climate-related emergencies, such as wildfires, flooding, and storms. Police Scotland and the Scottish Ambulance Service will also need to adapt to climate-related challenges, such as extreme weather events disrupting infrastructure, increasing road traffic collisions, and affecting the ability to respond to emergencies. Services' own assets will need to be climate-ready, including appropriate infrastructure for vehicle decarbonisation and buildings being energy-efficient. Climate resilience will become a key priority, with services needing to adapt to climate impacts and embed preparedness into their operations.

🏛 Public service reform

Emergency services like all public services are seeking to respond to public service reform, including addressing efficiency of asset use, service delivery improvements and preventative measures. This is however balanced against the increasing complexity of challenges. Integration to achieve an efficient group of emergency services while responding to changes will be important to implement. The increasing focus on preventative approaches within public services is also relevant. Emergency services will need to prioritise prevention and early intervention to reduce demand, such as Police Scotland addressing vulnerability and substance misuse, or SFRS focusing on fire prevention including in the wild, and community education. This shift will require a closer partnership with public health, social care, and third-sector organisations, with a consideration of asset and resource use to achieve the best outcomes. As we see across the public sector, advancements in data and technology offer significant opportunities to modernise and improve efficiency. Police Scotland, for example, can leverage data analytics and artificial intelligence to tackle emerging threats like cyber crime, predict crime hotspots, and allocate resources more effectively. The Scottish Ambulance Service can similarly develop more effective demand management and predictive data to support better outcomes. Collaboration around integrated data systems would further improve outcomes and delivery efficiencies. Such a move to more digitalised services will require universal mobile and data coverage

Scotland's Infrastructure

Economic priorities

Economic growth and infrastructure development, such as new housing or transport links, will increase demand for services in expanding regions. Emergency services will need to align their resource allocation to support economic priorities and ensure the safety of changing communities.

Global security

Global security concerns, including terrorism, organised crime, and cyber threats, will remain a key focus for Scotland's emergency services. Police Scotland will play a central role in preventing and responding to these threats, requiring ongoing investment in counter-terrorism capabilities, intelligence-sharing, and cyber crime prevention. Emergency services must also be prepared for large-scale emergencies, requiring enhanced collaboration between agencies, the development of robust contingency plans, and investment in special operations training and resources.

KEY MESSAGE

Scottish Government and its agencies should continue the process of greater integration and co-location with other public services to manage challenges and support reform. Greater collaboration and co-location across the public services will help address the increasing complexity of issues emergency services are facing, while supporting rationalisation of the estate where appropriate. This is likely to look different in rural and urban areas, taking a place-centric approach. There is also a need to address backlog maintenance and modernise the remaining estate, to respond to climate mitigation and adaptation needs, as well as modern service delivery models including a more digitalised service. In a changing world, the emergency services will need to be prepared for large-scale emergencies, building on the collaboration being developed, ensuring robust contingency plans are in place.

Scotland's Infrastructure

Defence

Defence is a reserved matter, however Scotland is the location for a number of defence sites, owned and operated by the Ministry of Defence, its commands and agencies.

There is a network of maritime, air, and radar assets, quick-reaction air defence, and support for protecting subsea infrastructure. These functions are delivered alongside a defence-industrial base concentrated in shipbuilding, aerospace and advanced electronics that underpins platform availability and specialist skills. This reflects the location of Scotland, which as the UK's principal northern operating area for defence, puts it in an important position for UK and NATO activities in the area, supporting the UK's strategic deterrent, homeland air policing and NATO commitments in the North Atlantic and the High North (Arctic and sub-Arctic regions).

12,000
£2 billion is spent on Defence in Scotland per year, supporting 12,000 jobs

This importance is reflected in the £2 billion spent in Scotland per year, understood to support over 12,000 jobs. **Defence spending is anticipated to increase from 2.3% of GDP to 2.5% by 2027.** In 2024 wider sectoral spending added £3.7 billion to the GVA of Scotland – covering aerospace, defence, security and space sectors. In addition, the MoD is a significant land owner in Scotland, with 64,800 hectares of land in 2025, 19% of the MoD total land holdings.

2.3%
Current % of GDP spend

2.5%
Anticipated % of GDP spend by 2027

The defence-industrial base in Scotland is concentrated in naval shipbuilding and advanced electronics in Glasgow and Rosyth; while in a number of locations, aerospace and sensors, radar and electro-optical systems are developed and used across air and maritime platforms; and a cluster of Scottish small and medium-sized enterprises in autonomy and subsea robotics contribute software, mission systems and services to Royal Navy and allied programmes. These activities support sustained employment and supply-chain development throughout Scotland.

Scotland's Infrastructure

⚖️ Opportunities and challenges

The opportunities include:

1 >
Data and technology, using sensors and AI to better understand assets and how to use effectively

2 >
System integration such as greater collaboration with allies, alongside strengthening asset management and jointly planning local infrastructure investment

3 >
Expanding apprenticeships aligned to investment plans

4 >
Supporting wider economic benefits through multi-year programmes and targeted SME support

Despite its strategic importance and investment opportunities, Scotland's defence sector faces challenges that could hinder its ability to meet future demands. One of the most pressing issues is the ageing estate and the need for modernisation.

> Much of Scotland's defence infrastructure requires upgrades to accommodate emerging capabilities and to remain fit for purpose.

Furthermore, the need to integrate climate resilience into estate modernisation adds complexity and cost, particularly as Scotland's defence sites face increasing risks from extreme weather events and rising sea levels.

Global security threats also pose a significant challenge. The evolving nature and increasing sophistication of these threats, including terrorism, cyber attacks, and the need to protect critical subsea infrastructure, requires Scotland's defence sector to continually adapt. This also requires a highly skilled workforce capable of addressing these risks.

Sustaining Scotland's defence workforce is becoming increasingly important, with some shortages in high-end skills. Advanced shipbuilding, aerospace, and robotics projects rely on a highly skilled workforce, but ensuring the retention and development of these skills requires continued investment in training and education.

Finally, the complexity of regulatory oversight presents an administrative challenge for Scotland's defence sector. Multiple regulators, including the Military Aviation Authority, Defence Nuclear Safety Regulator, and SEPA, oversee various aspects of defence activity, which can create inefficiencies and delays.

Scotland's defence sector also presents a range of opportunities for growth, modernisation, and innovation, driven by its strategic importance to the UK's national security and its role in NATO operations. Balancing Scotland's defence needs with wider MoD commitments will require careful resource allocation, particularly as the UK plans to increase defence spending to 2.5% of GDP by 2027.

Significant investments in infrastructure, such as at HMNB Clyde and RAF Lossiemouth, highlight the region's critical role in defending the North Atlantic and High North. Scotland's defence-industrial base is also poised for growth, particularly in naval shipbuilding and advanced technologies. Programmes at BAE Systems in Glasgow and at Babcock in Rosyth are not only critical to the Royal Navy but also support long-term employment and skills retention in Scotland. These programmes, alongside export opportunities for these programmes, provide a robust pipeline of work for Scotland's workforce and supply chains.

> Moreover, Scotland's expertise in cutting-edge technologies, such as radar systems, electro-optics, and subsea robotics, position it as a leader in defence innovation.

Collaboration with NATO and allied forces also offers opportunities to cement Scotland's role in global defence. Scotland's geographic location, close to the Greenland-Iceland-UK (GIUK) gap, makes it a key hub for NATO's collective defence activities.

Scotland's Infrastructure

> Multinational exercises staged from Scotland's bases, such as HMNB Clyde and RAF Lossiemouth, enhance interoperability with allied forces and allow Scotland to play a prominent role in addressing shared security challenges.

Building on these strengths while protecting the defence base through enhanced capabilities in cyber security, anti-submarine warfare, and surveillance will be essential to safeguard Scotland's strategic assets and infrastructure.

Addressing non-infrastructure challenges such as skill shortages through collaboration with the FE and HE sector, and by attracting younger generations to careers in defence will also be critical to maintaining a strong and capable workforce.

While Scotland's defence sector is well-positioned to capitalise on strategic investments, industrial growth, and international collaborations, addressing the challenges of ageing infrastructure, global security threats, economic pressures, and regulatory complexity is essential. Due to its sectoral strengths, infrastructure and geographical location, Scotland is likely to continue to play an important role in UK defence sector.

Key drivers

Defence is a reserved matter and a priority investment area, however is likely to still be affected by some of the drivers we have identified:

Demographics

Scotland's ageing population may create recruitment challenges for the armed forces and the defence-industrial workforce. As defence projects increasingly rely on highly specialised skills, attracting and training younger generations to careers in defence will become critical.

Public service reform

While defence is reserved, public service reform is still relevant to the UK Government. This is likely to see greater collaboration, efficiency, and sustainability, and the defence sector will need to align with these trends. The MoD will likely face increasing scrutiny around its use of resources, requiring more transparent and accountable decision-making. A focus on integration, resilience and early intervention could lead to increased collaboration between the defence sector and civil authorities to address emerging threats such as cyber attacks, pandemics, and climate-related disasters. Advancements in data and technology will be a strong component of developments, with an increasing reliance on digital systems, artificial intelligence and advanced analytics. The integration of digital technologies will also improve operational efficiency and enable better collaboration between defence forces, civil authorities, and international allies.

Scotland's Infrastructure

☀ Climate change

Climate change will be one of the most significant drivers of change for Scotland's defence sector. Rising sea levels and extreme weather events will pose risks to defence infrastructure, particularly coastal facilities such as HMNB Clyde. Ensuring the resilience of Scotland's defence estate will require substantial investment in modernisation and adaptation, including flood defences, improved building standards, and energy-efficient infrastructure. Operationally, climate change will alter the nature of defence activities. Scotland's proximity to the Arctic and North Atlantic will place it at the forefront of monitoring and responding to increasing activity in these regions as melting ice opens up new maritime routes and intensifies geopolitical competition. Climate-related emergencies, such as natural disasters, are anticipated to increase in frequency and severity, requiring greater collaboration between defence forces, civil authorities, and international partners to provide disaster response. This will necessitate investment in specialised equipment and training to handle these scenarios. Additionally, hardening of assets to climate impacts is a challenge. This could be a significant cost to the sector, with the potential to disrupt operations as assets are adapted or moved.

🔒 Global security

Global security challenges will continue to evolve, placing new demands on Scotland's defence sector. The increasing threat of cyber attacks, terrorism, and hybrid warfare will require enhanced capabilities in cyber security, intelligence, and counter-terrorism. Scotland's defence infrastructure, particularly its subsea assets and communications networks, will need robust protection against these threats. Geopolitical tensions in the Arctic and North Atlantic will likely also intensify, with Scotland playing a key role in monitoring and responding to increased activity in these regions. The strategic importance of HMNB Clyde and RAF Lossiemouth will grow as the UK and NATO rely on these facilities to protect vital air and sea corridors and safeguard subsea infrastructure. As NATO strengthens its collective defence posture, Scotland's military bases and training ranges will play an increasingly prominent role in joint exercises and operations, requiring seamless interoperability with allied forces.

💵 Economic priorities

Scotland's defence sector is a vital contributor to the economy, supporting thousands of jobs and generating significant economic value through shipbuilding, aerospace, and advanced technologies. Over the next 30 years, the sector's role as an economic driver will become even more important as Scotland seeks to diversify its economy and invest in high-value industries. Scotland's expertise in emerging technologies, such as autonomy and subsea robotics, offers opportunities for the defence sector to position itself as a global leader in these fields, supporting both domestic and export markets. However competing demands for public funds may limit the resources available for defence, requiring the sector to demonstrate efficiency and value for money.

⬎ KEY MESSAGE

Scottish Government should collaborate with UK Government to ensure Scotland is resilient to a changing world including terrorism, cyber attacks and the need to protect critical infrastructure such as the reserved areas of telecoms and energy. This includes integration with civil authorities to address emerging threats. The opportunities in high-end skills should be exploited, recognising the significant defence sector in Scotland, with targeted support and policies, capitalising on UK Government investment. Understanding investments and identifying enabling infrastructure may be an area of collaboration, ensuring a place-based approach is taken that facilitates improved outcomes for communities.

Scotland's Infrastructure

Justice

Scotland has a distinct and devolved justice system, with its own laws, courts, and judiciary. Under the Scotland Act 1998, legislative powers to administer the Scottish legal system were devolved to the Scottish Parliament, with responsibilities including criminal, civil, and family law, as well as administrative justice.

However, certain areas, such as terrorism and human rights safeguards, remain reserved to the UK Government. The system is overseen by key organisations, including the Scottish Government's Justice Directorate, the Crown Office and Procurator Fiscal Service (COPFS), the Scottish Courts and Tribunals Service (SCTS), and the Scottish Prison Service (SPS), alongside other public, private, and voluntary bodies.

The COPFS, as Scotland's prosecution service, is responsible for prosecuting crimes, investigating sudden or suspicious deaths, and addressing complaints against police involving allegations of criminal conduct. The court system, administered by the SCTS, includes a three-tier criminal court structure consisting of the High Court of Justiciary, sheriff courts, and justice of the peace courts, with the UK Supreme Court occasionally involved in cases related to devolution issues. The SPS manages the custodial estate, focusing on the secure custody, rehabilitation, and reintegration of offenders. Community Justice Scotland plays a vital role in driving progress on community-based justice initiatives to reduce reoffending and improve outcomes for those who have broken the law and support their communities.

> In recent years, the justice system has undergone significant changes, reflecting a shift in focus towards rehabilitation and community-based approaches.

There has been an increased emphasis on early intervention and diversion from prosecution for young people, aiming to prevent formal entry into the justice system. Victim support has also become a key priority, alongside efforts to modernise infrastructure and improve access to justice through digital services and remote testimony.

The Scottish Government has committed substantial funding to the sector, with £4.2 billion allocated to justice services in 2025-26. This funding aims to strengthen and reform key challenges faced by frontline services such as police, fire, prisons, and courts while focusing on preventative measures to reduce crime and reoffending.

£4.2bn
allocated to justice services in 2025-26

Scotland's Infrastructure

⚖️ Opportunities and challenges

The Scottish justice sector faces a range of [challenges](#) that impact its ability to deliver timely, effective, and equitable outcomes. One significant issue is the length of time taken to process cases, particularly in higher courts.

This has been exacerbated by case backlogs and increased workloads resulting from the Covid-19 pandemic, which have affected the Crown Office and Procurator Fiscal Service and the Scottish Courts and Tribunals Service. Additionally, many prisons in Scotland are operating at full capacity, which hampers the safe and effective management of the prison estate and limits the ability to deliver critical rehabilitative support and NHS services to offenders.

Overcrowding and drug-related issues within prisons remain pressing concerns, while the complexity of cases involving mental health issues highlights the need for a more navigable legal framework for vulnerable individuals.

The sector also faces operational challenges related to ageing infrastructure and the need to modernise technology. Some of Scotland's prisons are no longer fit for purpose, presenting safety and security risks and reducing the effectiveness of rehabilitative programmes. While modernisation projects, such as HMP Stirling are complete and HMP Glasgow is underway, a significant maintenance backlog in the prison estate remains, and many court buildings are categorised as requiring substantial repairs or replacements. Similarly, while Scotland has a digital strategy for justice, achieving a fully digital and user-focused system remains a work in progress.

Despite these challenges, there are significant opportunities to improve Scotland's justice system.

> Advancements in digital technology present a chance to enhance case management, improve public access to information, and increase the efficiency of judicial processes.

The Scottish Government is also exploring ways to optimise resources, such as expanding the use of Home Detention Curfews to alleviate prison overcrowding. A greater emphasis on prevention and early intervention, key public reform priorities, offers the potential to address the root causes of offending behaviour,

reducing reoffending rates and improving community safety. These will rely on greater system integration, including collaboration by all stakeholders in the social system.

While the challenges are broad, by modernising its infrastructure, addressing capacity constraints, and leveraging technology, the justice sector can become more efficient, inclusive, and responsive to the needs of the population. Alongside integrative services, addressing socio-economic issues for crime, preventative measures can also exert significant impacts.

Scotland's Infrastructure

Key drivers

The Justice Sector as a key public service sector is also likely to be further affected by some of the drivers we have identified:

Demographics

The changing demographics are likely to impact on the prison population over time, both in the services needed to address an ageing population, but also in recruitment of staff. Additionally, should migration continue, in addressing population decline, an increasingly diverse population is likely to require culturally sensitive justice services.

Public service reform

Public service reform priorities are ambitious for this sector, creating an integrated public sector service model, that is fit for the future. Reducing the prison population, through working across public services and driving prevention within communities will continue to be important. A greater focus on efficiency and value for money will require streamlining of processes and better use of resources. This may include the use of advances in data and technology to improve efficiency, accessibility, and fairness. The use of data analytics and artificial intelligence could enhance decision-making processes, such as risk assessments for bail or parole, and improve the allocation of resources. Digital technology such as the expansion of virtual court hearings and online dispute resolution mechanisms could make it easier and more cost-effective for individuals to engage with the justice system. Alternative dispute resolution mechanisms such as mediation and arbitration may be explored, to ease pressures on courts, alongside community-based sentencing options to reduce reliance on custodial sentences and the prison estate.

Climate change

Climate change will present new challenges for the justice sector estate in Scotland, requiring adaptation to climate threats, while developing assets for net-zero ambitions. This will need to be managed alongside investments to support new technologies, and prevention approaches that will likely impact on the type and scale of assets required, key strategies to reduce pressure on the prison estate in particular.

Global security

Evolving global security threats, such as terrorism, organised crime, and cyber attacks, will have a direct impact on Scotland's justice sector. Scotland will need to strengthen its capabilities to external threats including cyber security attacks, particularly as new technology and digitalised models of service delivery are developed.

KEY MESSAGE

Scottish Government and its agencies should continue the trajectory of prevention and early-intervention, to address issues of crime, while also managing the overcrowded prison estate. Additionally, by strengthening the justice system, through integration with social services, some of the key reasons for crime can be addressed at source, while alternatives to custody should be explored. As with many public services, an ageing estate and backlog maintenance need addressed, alongside modernisation to address climate mitigation and adaptation requirements. The service should also continue to evolve the potential of technology to create efficiencies and improve decision-making in the system and improve service user interface; while strengthening assets against cyber attacks.

Scotland's Infrastructure

Culture and recreation

Scotland's culture and recreation sector is a vital component of our national identity, economy, and community well-being. Responsibility for cultural policy primarily lies with the Scottish Government. The sector encompasses a wide range of organisations, including Creative Scotland, Historic Environment Scotland, and the National Performing Companies, which collectively promote the arts, preserve Scotland's heritage, and support creative industries.

Outdoor recreation is managed through a combination of national policies and local initiatives, with key organisations such as NatureScot and Forestry and Land Scotland contributing to the management of Scotland's natural and historic landscapes. Together, culture and recreation have a key role in supporting Scotland's social cohesion, economic growth, and global reputation.

£5bn
Creative industries contribution to the economy annually

Cultural assets also play a significant role in the Scottish economy, with the creative industries contributing over £5 billion annually and supporting more than 155,000 jobs. Scotland's historic environment generates £6 billion each year, with heritage tourism alone contributing £2.1 billion.

£6bn
Scotland's Historic Environment generates £6 billion each year

The nation is home to 55,932 protected heritage sites, including castles, monuments, and World Heritage Sites, such as the Old and New Towns of Edinburgh, the Antonine Wall, and St Kilda. Museums and galleries, supported by Museums Galleries Scotland, also make a clear contribution, attracting 8 million visitors annually and generating an estimated £900 million in spending. These institutions not only showcase Scotland's rich history and culture but also support education, creativity, and community engagement.

Recreation is underpinned by Scotland's natural landscapes and cultural heritage, providing residents and visitors with diverse opportunities for outdoor activities.

> The National Walking and Cycling Network spans 6,400 kilometres, encouraging sustainable travel and contributing £1.9 billion to the local economy.

Scotland's two national parks, 29 great trails, and 550 golf courses (many of which are globally renowned), further enhance Scotland's

appeal as a destination for outdoor enthusiasts. Marine and coastal tourism, mountain biking, and snow sports also represent key areas of growth, with activities such as sailing, diving, and skiing supporting local economies, particularly in rural and island communities.

Local authorities, and charitable organisations provide valuable local leisure, cultural and sport facilities including parks and open spaces, contributing to the vibrancy of places, while supporting active and healthy lifestyles. SportScotland also helps drive an active lifestyle, providing national training centres for professional athletes and sports enthusiasts.

Scotland's Infrastructure

⚖️ Opportunities and challenges

The culture and recreation sector in Scotland is currently facing significant challenges, particularly in the area of funding and finance. Local Government investment in culture, sport, and leisure services has decreased by 20% in real terms between 2010-11 and 2022-23, as the public purse has faced increased financial challenges. These financial pressures, coupled with long-term budget constraints, have led to the closure of several cultural and leisure services across the country, impacting public access and participation. Operational challenges, such as staffing shortages, facility management, and the ability to adapt to changing public needs, have further complicated the delivery of services. Additionally, the ongoing cost-of-living crisis in Scotland has reduced the sector's ability to generate income. This is despite Scotland's culture and recreation being key attractions for international visitors.

⬇️

20%
Government investment in culture, sport and leisure has decreased by 20% between 2010-11 and 2022-23

Despite these challenges, there are notable opportunities for growth and development in the sector. The adoption of digital technologies presents a significant opportunity to enhance access to cultural and leisure services, building on lessons learned during the Covid-19 pandemic when digital solutions became essential for public engagement.

> Scotland also has the potential to embrace its increasingly diverse population by ensuring cultural services reflect and celebrate a broad range of traditions and identities, fostering inclusivity and reflecting the nation's dynamic social fabric.

Furthermore, investment in asset development, including the extension of the National Walking and Cycling Network from 6,400km to 8,000km, or creation of a New World Heritage Site could attract more visitors and bolster Scotland's position as a global cultural and recreational destination.

Economically, strategic investment in Scotland's culture and leisure sectors offers opportunities to promote tourism, boost local economies, and enhance the well-being of communities.

Cultural tourism, already a significant contributor to Scotland's economy, could see further growth through initiatives that preserve and showcase Scotland's rich heritage and landscapes.

The creation of new cultural facilities could attract more visitors, enhance local business opportunities, and support job creation.

This, in turn, would provide a much-needed boost to the sector while addressing socio-economic inequalities and improving access to cultural and recreational activities.

While Scotland's culture and recreation sector faces pressing challenges such as financial constraints, operational hurdles, and the impact of the cost-of-living crisis, it also has significant opportunities to innovate and grow. By investing in digital technology, reflecting Scotland's diverse cultural identity, and expanding its cultural and recreational assets, the sector can not only enhance public access and engagement but also contribute to the nation's economic growth and long-term sustainability. Strategic support and funding will be critical to unlocking the full potential of this vital sector.

Scotland's Infrastructure

Key drivers

Our culture and recreation sector is integrated across our infrastructure assets and will be affected by many of the drivers we identified including:

👥 Demographics

Scotland's ageing population and increasing diversity will have notable impacts on the culture and recreation sector. As the population ages, there will be growing demand for cultural and recreational activities that cater to older individuals, while there will be a need for adaptations to infrastructure to ensure accessibility. At the same time, increasing cultural diversity will influence the types of cultural offerings and recreational services provided. Youth engagement will also remain a priority as Scotland seeks to attract younger audiences to cultural and recreational activities. Tailoring programmes to appeal to younger generations, such as interactive digital experiences, esports, or youth-focused music and arts festivals, will be critical to sustaining the sector's relevance.

🏛 Public service reform

The evolution of the public sector in Scotland will place greater emphasis on collaboration, efficiency, and sustainability. Budgetary pressures within the public sector will necessitate innovative approaches to funding. Cultural organisations and recreational providers may increasingly rely on public-private partnerships, philanthropic support, and community fundraising to complement government funding.

Climate change

Climate change will present both challenges and opportunities for Scotland's culture and recreation sector. Rising sea levels and extreme weather events could threaten historic assets, such as listed buildings, monuments, and coastal heritage sites. Significant investment will be required to protect and adapt these assets to ensure their preservation for future generations. Recreational activities tied to Scotland's natural environment will also be affected by climate change. Changes to weather patterns could disrupt outdoor activities such as snowsports, which rely on consistent snowfall, or impact marine leisure tourism due to rising sea levels. However, climate change also creates opportunities to promote low-impact and sustainable tourism. Scotland's national parks, trails, and greenspaces could play a key role in encouraging eco-tourism and raising awareness of environmental conservation.

Scotland's Infrastructure

Economic priorities

The creative industries, which contributed over £5 billion annually to Scotland's economy, will continue to be a key driver of growth. Cultural tourism will remain a major economic contributor, with Scotland's historic sites, museums, and galleries continuing to draw millions of visitors annually. Increased investment in creative sectors such as film, gaming, and digital media could attract talent and boost exports, enhancing Scotland's reputation as a global cultural hub. Embracing advancements in data and technology could support growth ambitions, making the sector more resilient for the next generation, by developing new ways to engage with audiences and improve service delivery. This could include offering virtual museum tours, online performances, and interactive exhibits while data analytics can be used to personalise visitor experiences, optimise resource allocation, and improve decision-making. By investing in heritage conservation, modern visitor facilities, and innovative experiences, Scotland can capitalise on its reputation as a top cultural destination. The culture and recreation sector will also need to respond to economic disparities by ensuring that cultural and recreational opportunities are accessible and that the economic benefits of the sector are widely shared.

Global security

Global security concerns, such as terrorism, cyber threats, and geopolitical instability, will have indirect but important impacts on the culture and recreation sector. Increased security measures may be required to protect large public gatherings, cultural events, and iconic sites from potential threats. Cultural institutions will also need to safeguard their digital infrastructure against cyber attacks, particularly as they increasingly rely on digital platforms for operations and engagement. Cultural diplomacy could also become a more prominent aspect of Scotland's international engagement, using cultural exchanges and collaborations to build bridges with other nations.

KEY MESSAGE

There are a number of stakeholders involved in the extensive culture and recreation sector, with Scottish Government, its agencies and Local Authorities having key roles. Collaboration to address the financial challenges in the sector is essential, recognising the role of services for broader community and social wellbeing and participation, alongside being a key attraction for tourism. Supporting the evolution of services to digital platforms where appropriate, while supporting community vibrancy is important. Alongside this, targeted investment to maximise impacts would be beneficial, including addressing climate-vulnerable sites, while expanding opportunities for public-private partnerships, philanthropic support and community fundraising. Security and resilience should be embedded in practises, to protect people and assets.

Scotland's Infrastructure

Blairgowrie Recreation Centre

Scotland's first Passivhaus leisure centre, delivering community facilities and prioritising energy-efficiency.

Blairgowrie Recreation Centre, completed in 2025, is Scotland's first Passivhaus leisure facility, combining community amenities with ultra-low energy design. Serving eastern Perthshire residents and Blairgowrie High School pupils, it offers a swimming pool, sports hall, health club, dance studio, and 3G sports pitch.

Replacing the 1980s centre, its Passivhaus construction, using cross-laminated timber and Glulam, reduces energy use by up to 80% compared to conventional leisure buildings.

The £36 million project, funded by Perth and Kinross Council and delivered via hub East Central Scotland, meets accessibility and sports facility standards. Operated by Live Active Leisure, it sets a benchmark for sustainable public infrastructure.

> This project marks a significant milestone not only for Perth and Kinross Council, but for Scotland. As the first of its kind in the country, it is a testament to what can be achieved when good design and sustainability are combined. With this being a landmark building in the area, we understood its cultural significance and wanted to design a space that would pay homage to the local community, enhance the experience and learning of students, and meet the council's ambitious sustainability targets. We hope Blairgowrie Recreation Centre will inspire more leisure centres in Scotland to be designed with Passivhaus in mind, creating inclusive, sustainable spaces where communities can thrive.

YIDA ZHOU, PROJECT ARCHITECT AT HOLMES MILLER

LOCATION: Blairgowrie

STATUS: Complete

PRIORITISING PLACE   ENERGY TRANSITION

Scotland's Infrastructure

Natural infrastructure

Natural infrastructure

Scotland's natural capital, encompassing its land, water, air and related ecosystems, is a vital resource underpinning the nation's economy, environment, and well-being. Responsibility for managing and enhancing natural capital lies primarily with the Scottish Government and its agencies, including NatureScot, the Scottish Environment Protection Agency (SEPA), Marine Scotland, Forestry and Land Scotland (FLS), Scottish Water and various conservation charities.

£254.7bn
Valuation of Scotland's natural assets in 2022

These bodies work with local authorities, private landowners, and community organisations to oversee the sustainable management of natural resources, while contributing to national climate and development goals. In 2022 Scotland's Natural Capital Accounts valued Scotland's natural assets at £254.7 billion.

Scotland's natural capital provides invaluable ecosystem services that support the country's economy, environment, and society. These include provisioning services such as food production, timber, and renewable energy; regulating services such as helping remove pollution from the air and regulating our climate; and cultural services, which enhance our health and wellbeing,

260,000
Scotland's natural capital supports around 260,000 jobs

including recreation and tourism. Industries most directly reliant on natural capital, such as agriculture, forestry, fishing, aquaculture, and renewable energy, contribute over £40 billion annually to Scotland's economy, supporting around 260,000 jobs.

> Additionally, nature-based tourism generates an estimated £1.4 billion in annual economic impact, illustrating how Scotland's natural beauty and biodiversity are vital drivers of tourism and local economic development.

Our natural capital touches every aspect of our lives and is increasingly recognised as invaluable to support not only the health of our environment, but society and our economy. The preservation of natural habitats, such as peatlands, forests, and coastal areas, is therefore critical, not only for climate resilience but also for maintaining these economic and societal benefits.
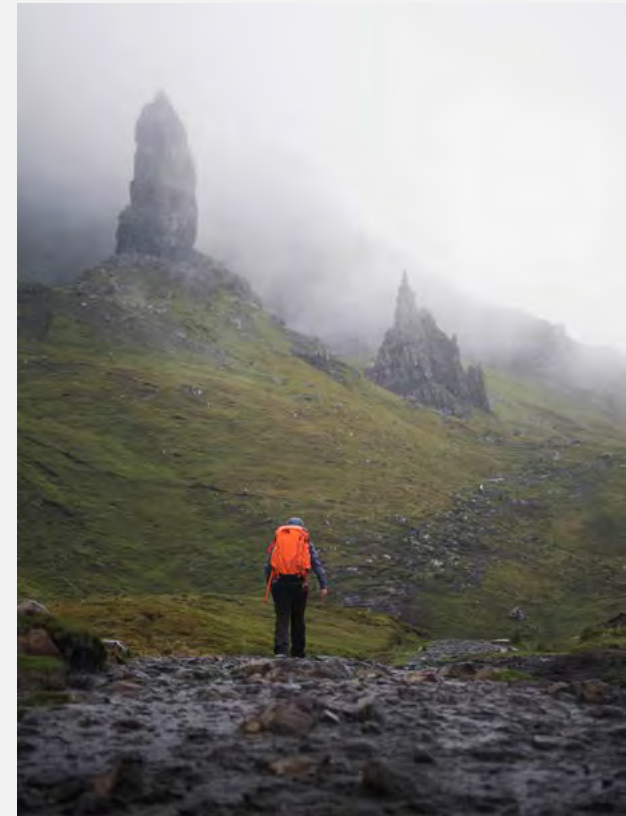
Scotland's Infrastructure

⚖️ Opportunities and challenges

The natural capital sector in Scotland faces numerous challenges that impact its ability to protect and enhance the environment while supporting economic and social development. Climate change impacts and biodiversity loss are key issues, with the potential collapse of ecosystems posing a significant threat to Scotland's resilience. This is not a new issue, as research suggests natural capital in Scotland experienced significant decline between 1950 and 1990, and while efforts to restore it are ongoing, much work remains to return it to historic levels. For example, over 80% of Scotland's peatlands, a critical carbon sink, are in poor condition, which can have the effect of them becoming net emitters of carbon. Rising sea levels and coastal erosion threaten Scotland's extensive coastline, placing £20 billion of infrastructure and properties at risk. Additionally, **the condition of Scotland's woodlands, while increasing in coverage, has deteriorated by 27% since 2000, showing the need for improved management and restoration.**

27%
deterioration of Scottish woodlands since 2000

Another recognised issue is the private investment gap in nature, driven by difficulties in demonstrating direct financial returns on initiatives such as Blue-Green Infrastructure and Nature-based Solutions (NbS), whose benefits are often primarily enjoyed by communities rather than private investors.

> Long-term, patient investment is required for nature recovery, as immediate financial returns are rarely apparent.

Additionally, the lack of integration of natural capital and ecosystem services into investment decisions, coupled with challenges in navigating emerging natural capital markets, has hindered progress.

On a systemic level, current legislative gaps are identified as exacerbating these issues, such as the absence of statutory duties for authorities to manage rainwater drainage in public spaces, which limits Scotland's ability to address urban flooding and build climate resilience.

Similarly, land ownership patterns, with a small number of private landowners controlling vast areas, is proposed as presenting barriers to incentivising nature recovery and encouraging widespread investment in natural capital. This is however debated, with some large landowners focused on re-wilding and similar initiatives.

Further, increasing the stock of natural capital, such as tree planting, does not always translate to improved environmental quality, highlighting the importance of ensuring the "right tree in the right place." Moreover, achieving sustainable tourism growth, such as managing the environmental and social impacts of popular routes like the North Coast 500, remains a complex balancing act. These issues suggest the need for more co-ordinated policy frameworks and financial incentives to address systemic barriers and promote sustainable practises.

30%
Scotland aims to protect 30% of land and sea for nature by 2045

Despite these challenges, Scotland's natural capital sector is presented with significant opportunities, particularly through targeted investment, innovation, and policy alignment. The Scottish Government has committed substantial funding to natural capital restoration, including the £250 million Peatland ACTION programme, the £55 million Nature Restoration Fund, and initiatives like the Forestry Grant Scheme and Scottish Marine Environmental Enhancement Fund. These investments aim to restore key natural assets, improve biodiversity, and support Scotland's ambitious climate goals, including the "30 × 30" target of protecting 30% of Scotland's land and sea for nature by 2045.

Furthermore, nature-based solutions, such as Blue-Green Infrastructure and Natural Flood Management, offer sustainable ways to address climate resilience, enhance biodiversity, and improve urban design.

Scotland's Infrastructure

By integrating green spaces and water systems into urban and rural areas, Blue-Green Infrastructure can mitigate flood risks, enhance urban liveability, and contribute to the creation of water-resilient communities.

Enhanced data collection and monitoring, such as mapping a national rainwater drainage management network and improving the Natural Capital Asset Index, can provide critical insights into the state of Scotland's natural environment and help target areas for intervention.

Economically, the emergence of natural capital markets provides an opportunity to attract private investment while embedding ecosystem services into decision-making processes. Measured land reform and empowering communities to participate in land use decisions can encourage a sense of ownership and responsibility, promoting long-term stewardship of natural assets.

> Additionally, access to nature supports physical activity, enhances mental well-being, and supports social interaction, which can reduce healthcare costs and boost economic productivity.

With strategic investment, innovation, and community engagement, Scotland's natural capital sector has the potential to play a pivotal role in tackling climate change, enhancing biodiversity, and improving quality of life for current and future generations.

Key drivers

Scotland's natural capital sector will be significantly influenced by many of the key drivers:

Demographics

A changing demographic is likely to impact on the type of natural spaces an ageing population will prefer for recreation, with a focus on accessibility. Meanwhile, should international migration continue, Scotland's growing cultural diversity presents an opportunity for a more inclusive approach to natural capital, ensuring access to nature and conservation initiatives reflect the needs and interests of different communities.

Public service reform

The public service reform agenda includes challenging public finances, already seen to impact on our natural assets. The sector will need to adapt to these financial constraints and prioritise investments, including a greater focus on Nature-based Solutions and Blue-Green Infrastructure, to create increased value across our communities. It is also likely that the funding model and partnerships will need to evolve, creating greater collaboration between public agencies, private investors and community organisations, to achieve priorities. Improved real-time monitoring of our natural assets through data and technology developments would also support our ambitions, ensuring we navigate the appropriate management of our resources.

Scotland's Infrastructure

☁ Climate change

Our natural capital has a role in helping both mitigate for climate change through carbon sinks, as well as in adapting to climate impacts through Nature Based Solutions and Blue-Green Infrastructure. However, it is equally at threat from climate change, and increasing frequency of extreme weather events, rising sea levels, and biodiversity loss, threaten Scotland's ecosystems, from its vulnerable peatlands to its coastal habitats. The collapse of ecosystems could undermine its ability to support mitigation and adaptation efforts. Appropriate investment is therefore needed to secure the resilience of our natural resources.

🖼 Economic priorities

Natural capital sustains many existing and emerging sectors, such as agriculture, forestry, tourism and renewable energy. Nature-based tourism, which already generates £1.4 billion annually, has the potential for further expansion, particularly as global demand for eco-tourism increases. Scotland's natural landscapes and biodiversity are key assets that can attract visitors and support local economies, particularly in rural areas. Furthermore, emerging natural capital markets and private investment opportunities offer the potential to generate revenue and fund large-scale restoration projects. To maximise these opportunities, it will be essential to embed the value of natural capital into policymaking and investment decisions, ensuring that economic growth aligns with environmental sustainability.

🔒 Global security

Our natural capital is likewise core to many of our global security ambitions, particularly in secure access to water, food and energy. Like many other sectors it may however also face risks from cyber threats targeting infrastructure and data systems, particularly as it becomes more reliant on digital technologies for monitoring, mapping, and management of natural capital. Recognising the role of our natural capital to support resilience in a changing world is valuable.

⬎ KEY MESSAGE

Scottish Government and its agencies should continue to strongly regulate and enforce the protection of our natural environment, ensuring its rich resources are available for economic, social and environmental benefit. This includes using technology to monitor asset resilience, while strengthening the ecosystem and addressing decline through investment. Accessing nature-based-solutions to address climate challenges is a significant opportunity to reduce adaptation costs while protecting biodiversity. Exploiting opportunities within a regulated system, that appropriately values natural assets could include creating greater private sector investment, encouraging long-term patient finance. The role of natural assets in our daily life and those of our communities should be supported, recognising its role for wellbeing; while encouraging long-term stewardship and community empowerment through measured land reform, continues to be important.

Scotland's Infrastructure

System picture

This section has shown the scale of Scotland's infrastructure sector, encompassing assets that we value across our daily lives. Whether driven by known challenges and opportunities or those that will arise from the key drivers of change, this review illustrates a level of consistency.

While challenges are broad, opportunities are also significant, painting the picture of how infrastructure can continue to evolve to be relevant to a thriving future, playing an even stronger role in society and the economy.

> For example, many public sector assets are challenged by an ageing estate, often with significant maintenance, potential issues with RAAC and improvement needs, alongside increasing service demands in some key areas such as health.

Focusing on public service reform to address rising costs, while achieving improved outcomes is therefore a significant focus for Scottish Government. This requires a level of integration and asset management that would be transformative, with data and technology having a significant role to deliver services differently. Additionally, behaviour change including preventative practices need to play a part in constraining demand, whether it be to reduce water usage or improve health behaviours.

We also see that climate change mitigation efforts are driving significant energy sector opportunities, but creating challenges for the public purse in adapting assets and reducing emissions. The economic opportunities of climate mitigation efforts are stimulating new technology and markets, however there are challenges in coordinating investment to fully exploit opportunities, with UK Government liaison and public sector co-ordination to leverage these opportunities important. Public sector emission reduction and adaptation of assets however needs to be considered within the broader public service reform agenda, recognising the cost of these changes.

> Finally, we have supply issues in sectors that are primarily delivered by the private sector, such as housing, where we have increasing numbers of homelessness and a system that is unaffordable for many.

There are significant system and financial issues to be addressed in tackling this challenge, requiring collaboration across public, private and community groups to achieve the best outcome.

In adapting our assets for the future, some of the drivers are already being considered by sectors, such as the changing public sector, driving efficiencies and improved integration of assets and services. Others, such as global security are only beginning to be mainstream considerations, whether that be concerns around subsea cables, or the more transactional international relations emerging globally, affecting trade and security.

Equally, demographic changes are becoming more acute, and the changes needed to address these impacts have to be considered whenever assets are being developed, but also in areas where workforce and skill shortages are already being felt.

Understanding our infrastructure is an essential first step to improved management and utilisation. This analysis has highlighted some shortfalls. We would recommend to better direct and manage our assets we need:

- Better and more consistent data on asset bases, values and maintenance needs.
- A national infrastructure GIS.
- Consistent asset strategies and asset management plans to support investment transparency and prioritisation.

The consistency and clarity we have illustrated on sectoral opportunities and challenges, allows us to consider cross-sectoral infrastructure priorities, to emphasise the interaction and interdependencies of our sectors.

In the next section we discuss six cross-cutting themes which support a system consideration of infrastructure. A system approach should be integral to our infrastructure investment decisions. This will allow us to maximise benefits, while addressing and mitigating for possible disbenefits of investments, when not considered as part of an interconnected system.

Scotland's Infrastructure

SSEN Transmission & Orkney Islands Council

Strategic infrastructure in support of Scotland's green economy while addressing the issue of vacant homes.

LOCATION: Orkney

STATUS: Current

ENERGY TRANSITION   DEMAND DYNAMICS

Orkney Islands Council and SSEN Transmission have partnered to address housing shortages and support renewable energy infrastructure on mainland Orkney.

With up to 220 MW of new renewable electricity requiring on-island staff, the scheme targets the area's high vacancy rate, 6.3% of homes, by providing owners up to £25,000 to refurbish long-term empty properties. Renovated homes are leased to SSEN-Transmission management staff at reduced rent until 2028.

This place-based approach revitalises housing stock while facilitating infrastructure delivery, demonstrating a mutually beneficial strategy linking local community needs with national energy transition objectives, through co-ordinated investment and joint delivery.

Scotland's Infrastructure

05
Cross Cutting Themes

Cross Cutting Themes

Cross-cutting Themes

System themes

The analysis in previous sections includes both a top-down and bottom-up assessment to understanding the opportunities and challenges we are likely to face in Scotland over the life of this Needs Assessment. The top-down drivers of change, including policy and significant trends, alongside the sectoral bottom-up view, allow issues to be considered at different levels and by different stakeholders, whether that be policymakers driving climate mitigation, or stakeholders delivering on education assets.

However, infrastructure is a system of systems. Therefore, considering this analysis as a collection, through a system lens, allows us to provide cross-cutting areas for consideration, that will create added value within this system if addressed. Whether it be minimising disbenefits, or enhancing opportunities for the long term, this section provides our key system messages to achieve the best outcome, through effective and integrated infrastructure decision-making.

We have collated these areas for consideration under six cross-cutting themes of: **energy transition, nature positive, prioritising place, data and technology, asset and climate resilience**, and **demand dynamics**, illustrated in Figure 7.

Figure 7: Cross-cutting themes
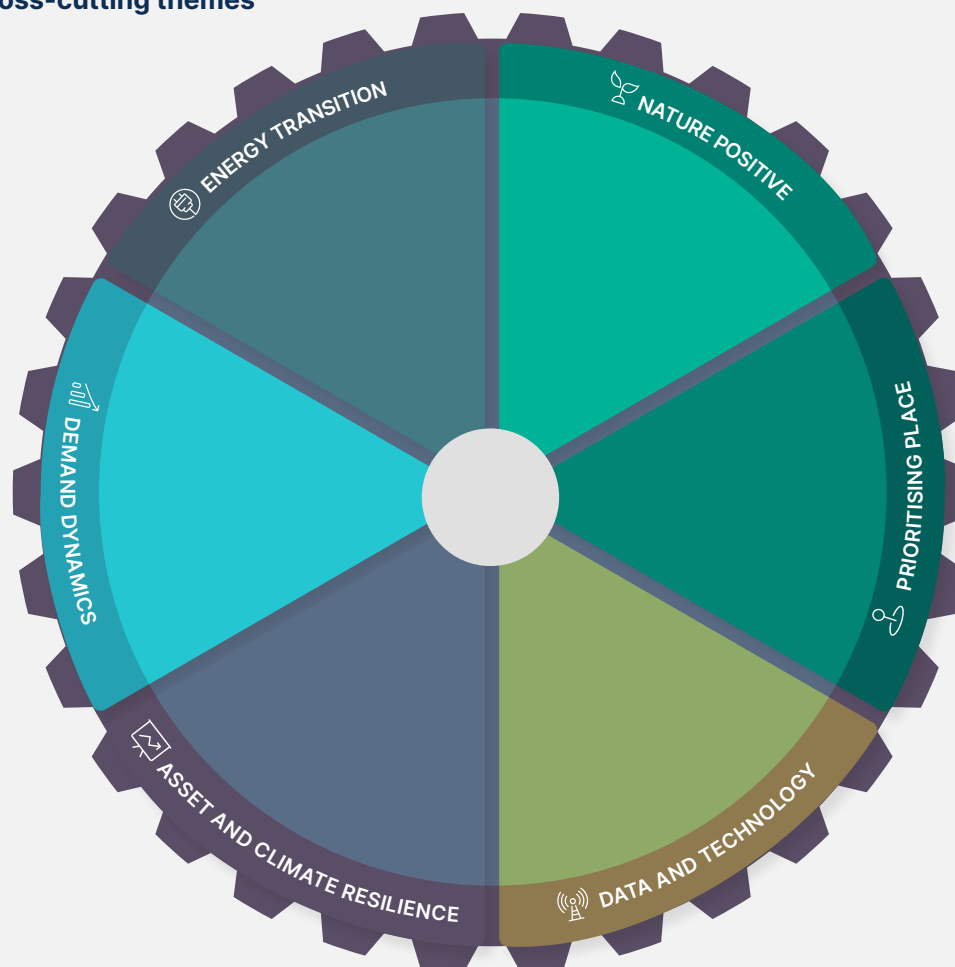
Energy transition

In Section 4, we described the fundamental transformation that is happening in the energy sector.

However, the impact of that transformation extends into every component of the infrastructure required for the generation, transmission, production, conversion, storage and as importantly the end use of that energy; be that through the repurposing, downscaling or decommissioning of existing or the development of a vast range of new infrastructure. The all-encompassing nature of this transition across the infrastructure landscape is summarised and illustrated in the table below.

In assessing the complexity of the system-wide impacts it will be important to consider the dependencies, synergies and alternatives across the whole infrastructure system, in order to plan and deliver the most effective overall energy transition infrastructure.

Table 2: Energy transition infrastructure impact

ASSET GROUPING	DESCRIPTION	EXAMPLES
Generation assets	Assets to generate net zero power	Offshore and onshore turbines, solar panel, pumped hydro
Transport and storage assets	Assets to transport or store the power from source	Transmission grid, heat networks, hydrogen storage
CO_2 capture assets	Assets to capture, utilise and store CO_2	CCUS, natural assets
Connection assets	Assets that connect the energy source to the user or demand assets	Energy centre, heat pumps, EV charging assets
User/demand assets	Assets where the energy is used	House, hospital, school, car, HGVs, bus, train
Enabling assets	Assets that support or enable the transition that are not directly transitioning themselves	Roads, ports/harbours, manufacturing plant and materials in support of energy transition

Enabling
Success

Supporting
Evidence

Dependencies

There will be some clear dependency (or risk) between sectors – i.e. where development relies on activity in another sector to enable that development or investment to materialise.

Examples include:

- **Electrification** is expected to form a significant part of the decarbonisation of heat, industry and light transport vehicles. This implies both a significant increase in renewable generation capacity and substantial investment in the grid. Particular attention will need to be paid to the peak capacity requirement – domestic heat in particular may not be able to be time shifted away from evening peak requirement. The business models for most of the electricity system are well established but will require significant evolution as part of a Reformed National Market, to manage a growing proportion of the energy mix coming from renewable generation and the associated peaks and troughs in power of such a system.

- **Some industrial decarbonisation** – that can not electrify – **may be dependent on alternative fuel sources such as biofuels or low-carbon hydrogen**. The transition of such industry away from methane is likely to be in the longer-term, once alternative options are available and affordable.

Synergies

There will be circumstances where, with a greater degree of coordination, planning, regulation and system design across sectors, synergy benefits could be realised that could lead to increased investment potential or to enhanced outcomes.

Examples include:

- There are synergies between **offshore wind and oil & gas in terms of skills and electrification of oil & gas platforms**. Offshore wind can use the offshore skills and expertise that are present in the oil & gas sector, and can therefore offer jobs to workers who have been displaced from the oil & gas sector during its decline. Having the offshore skills necessary to develop offshore wind already in Scotland may mean that Scotland has a competitive advantage in terms of expanding its offshore wind production, as it may be able to do this faster or at lower cost than other countries due to reduced levels of retraining required.

- If hydrogen is used in clusters, then **there would be geographic synergies from placing hydrogen customers** – industrial heat and transport – **geographically close to each other**. Such clustered deployment could be done on an integrated ownership model of (green) generation, distribution and supply. Multiple sources of demand may pave the way for early private investment at scale, as this de-risks the income stream for investors.

Alternatives

There is a potential for alternative supply or usage across the system, that will require priorities to be determined, or where decisions around phasing could be considered.

Examples include:

- **Green hydrogen and Carbon Capture Utilisation and Storage (CCUS) both present decarbonisation options for industry that cannot electrify, and are therefore alternatives**. Both require upfront investment from industrial customers, either upfront capital expenditure to install carbon capture equipment or to fuel switch their equipment (e.g. boilers). Given that both require significant upfront expenditure, industrial customers may try to choose only one technology – either hydrogen or CCUS – for the lifetime of the asset, rather than installing carbon capture and then switching to hydrogen (for example).

- **Clean Heat Networks** and **individual heat pumps** are potential alternative sources for domestic heating. Both require considerable upfront investment in heat source generation, transmission and distribution networks and end user technology to heat within properties, and there are many locations where both could be a potential solution as an alternative to gas boilers. There will be a need for long term planning and co-ordinated decision making, to ensure both financial and operational efficiency and deliverability can be achieved, and that the most appropriate overall domestic heat infrastructure systems are installed.

Investing for the transition

The scope and scale of change to the infrastructure required across the whole energy system – from generation, transmission, distribution through to end use and in some cases reuse and capture – will require a complete transformation to the levels of investment, and how investment in those energy systems and the end user assets are funded and financed.

In looking to assess the key funding, financing and investment elements across this infrastructure system, the following challenges will face governments, regulators, industry and the investment market:

- **The scale of investment is so significant and will have intergenerational impact.** Most of the direct costs cannot all be borne by government upfront and therefore major private investment is needed alongside government resources.
- **Any additional investment from the private sector requires an income stream to repay it** – either through government subsidy, regulatory tools, increased bills or raising revenue through general taxation beyond the current levels.
- **Scale of societal behavioural change will influence the extent and speed of development of new infrastructure**, e.g. level of investment in energy efficiency, level of reduction in car miles, switching to zero emissions heating in our homes, our workplaces and in our communities, and decarbonising our industries and transport. These require coherence and coordination from diverse portfolios and to align with consumer engagement.
- The long-term horizon between infrastructure-needs identification, development and delivery means **investing in generation and network infrastructure in advance of need**.

- **New investment is needed** where many of the regulatory and legislative powers are reserved.
- **Planning** and consenting for the new infrastructure assets across all geographies and communities **is complex and still in development for some areas**.
- **Complexity of the classification rules** (assets must be privately classified for additionality to capital budgets) as well as subsidy control rules, working across regulated and reserved areas such as the Climate Change Act, Fuel Poverty Act.

- Existing capital budgets and resource budgets **remain constrained**.
- **Timeframes** to develop and deliver infrastructure and behavioural change to meet the 2045 statutory commitments **are challenging** and ahead of commitments across the Rest of the UK.

A defined path

While many levers sit with Scottish Government, energy is a reserved matter, and so continuing to work with UK Government to support the transition effectively is essential.

In the UK Government 10-year infrastructure strategy, there is the ambition to make the UK a clean energy superpower, with a number of projects established to support this. This alignment of priorities provides a strong base for progress, as does the investments seen in ports for floating offshore wind.

We understand the challenges, we have the framework, however more could be done in establishing clarity in the route map towards transition, aligning public policy and support to the opportunities. This would support transparency for the private sector and partners, ensuring the benefits of transition are fully realised.

As we have highlighted, there is existing analysis to understand what needs to be done to transition. To achieve the twin objectives of addressing climate change and creating economic opportunities, Scotland needs to be on the front-foot, prioritising investment with a clear path to support energy transition, collaborating with UK stakeholders.

This includes:

- **Working at a UK level including with the National Energy System Operator (NESO), prioritising and focusing public investment to unlock private sector investment.** This means a clear prioritised action plan to drive investment, recognising the role of transmission and distribution infrastructure to support generation innovation; and ensuring that, through major demand side flex/flexible grid technologies, storage market development and diverse renewables, the stability of energy output is ensured.

- **Creating an energy transition action plan that includes the energy-focused National Developments and other prioritised energy investment projects.** This will require focused and expert resources and build upon the annual monitoring of the national developments. Using the levers available to identify, prioritise and remove barriers to delivery. As we have noted, this will not always mean public monies, however where that is the only route forward and the business case established, it should be prioritised over the lifetime of this Needs Assessment, within a broader action plan. Providing market certainty should be a priority, or this opportunity will be missed.

- **Working with UK Government to support a balanced investment model in addressing barriers to development, including ensuring user costs are minimised.** This requires a clear understanding of the energy system, its supply chain and economic benefits as well as barriers. This is likely to require addressing the UK's significant spark-gap in relation to the high cost of electricity against gas.

Enabling Success

Supporting Evidence

Supporting Scottish impacts

Ensuring investment benefits the people of Scotland, through both supply-chain developments; and national community wealth building principles supported by a strong understanding of the energy system and its supply chain. Addressing the risk that energy production industries located in Scotland, utilise assets and short-term construction benefits, but does not benefit significantly over the longer-term.

The Just Transition Commission has a key role to ensure the energy transition benefits the people of Scotland. Their work is closely aligned with Climate Change policy, considering how individual infrastructure sectors can both mitigate and adapt to climate changes alongside establishing clear principles to direct action. In the context of energy transition, these principles are of particular importance. Scotland is making progress, however the Just Transition work needs mainstreamed urgently, through tangible actions to ensure Scotland and its people benefits. Facilitating Scottish supply-chain developments and growth, across sectors, also requires structured action, to ensure the benefits of transition are fully realised.

This includes:

- Clearly understanding the interaction across the infrastructure system of the energy transition, to support social, economic and environmental impacts that sustain our communities and including this in our defined path of action to maximise value.
- Learning from the experiences of other nations and improve upon the approaches taken in the development of the oil and gas sector, to ensure a Just Transition.
- Balancing upstream and downstream impacts to ensure new energy industries can achieve critical mass, with a longer-term focus on

societal benefits. This should be clearly articulated and tracked within the energy transition action plan, including transparent trade-offs.

- Build energy transition into the asset plans for all infrastructure sectors, including new infrastructure assets and networks such as charge points, HGV charging and heat networks. These plans should take a lifecycle approach, identifying the opportunities across the life of an asset, creating supply chain opportunities, while managing assets efficiently.
- The public sector role in protecting communities from disbenefits, to support investment through taking on some of the risks which can over-burden emerging markets when transferred wholesale through the planning and procurement system. This again should be part of the energy transition action plan, making this a clear signposting that supports investment. As with many of these recommendations, it requires a strong expert understanding of the energy market, to balance removing barriers while ensuring value for money.
- Aligning all investment and support to the private sector with the Just Transition Commission's work on Conditionalities, to unlock green energy investment, ensuring the benefit for wider Scotland.

KEY MESSAGE

Public and private sector co-ordination as well as UK and Scottish Government collaboration will be essential to address energy transition issues and promote opportunities across the infrastructure system. Addressing technical challenges and opportunities, including driving new technologies to support the generational opportunity of transition to low and zero carbon energy; with clear pathways to ensure Scotland can achieve and sustain a competitive advantage. This defined path will require targeted investment and implementation of existing priorities, while removing barriers that hinder progress. The energy transition touches upon the entirety of our economic, social and natural world and its infrastructure. Explicitly understanding dependencies and exploiting synergies at pace will achieve the best outcome for Scotland.

Enabling Success

Supporting Evidence

Grangemouth Industrial Cluster Strategy

Infrastructure Investment to support a Just Transition to a low-carbon energy hub.

The Grangemouth Industrial Cluster is a major contributor to Scotland's economy, generating significant gross value added (GVA) and supporting jobs, particularly in chemicals and petrochemicals.

As one of the country's largest industrial emitters, it is central to achieving Scotland's 2045 net-zero target. Established governance challenges are being addressed through the Grangemouth Future Industry Board, which coordinates strategy, community benefits, workforce development and environmental action.

A cluster strategy and major public investment through the Just Transition Fund, national programmes and local growth deals, aim to unlock private capital and support low-carbon infrastructure.

Regulatory innovation and initiatives like Project Willow are driving the cluster's transition to a sustainable, low-carbon industrial future.

LOCATION: Grangemouth

STATUS: Current

ENERGY TRANSITION | PRIORITISING PLACE

Enabling Success

Supporting Evidence

Nature-positive

A fundamental asset

Scotland's natural assets support our economy through areas such food and drink; societal capital through green spaces or clean water to drink; and supports biodiversity and other environmental priorities. While this provides a strong impetus to protect these assets from threats such as climate changes, increasingly it is also a rich resource in helping us to mitigate and adapt to climate change.

> Nature is at the heart of our society and using it well, to achieve the impacts that support our objectives, while protecting it for the future and future uses, has to be integrated into our ways of working.

The UK Natural Capital Accounts seeks to assess the current and future value of our natural wealth, through understanding its contribution to the economy and society. This identified the annual value of ecosystem services in 2022 as £5.9 billion excluding oil and gas or £38.7 billion including. These figures can fluctuate primarily due to oil and gas prices, however are also seen not to be an exhaustive grouping. It is believed that by not acknowledging natural capital in the same way as other assets, that we have not sufficiently protected or invested in it for the long term.

Beyond climate mitigation and adaptation, many of the energy transition sectors rely on natural capital such as wind, water or land, as

£40bn

Industries reliant on natural capital, support £40 billion of economic output and 260,000 jobs

a resource. Research published by Scottish Government in 2024 notes that industries reliant on natural capital, excluding oil and gas, already support around £40 billion of economic output annually, or around 14% of Scotland's economy, and at the minimum around 260,000 jobs, directly and indirectly. This includes the industries of agriculture, fishing and aquaculture, forestry and timber, water and sewage, spirits/wine and beer/malt sectors, and renewable electricity. The recently published Climate Change Plan 2026-2040 as well as the Scottish National Adaptation Plan 2024-29 both acknowledge the importance of these assets.

Greenspace and wellbeing

As pressure on the public purse has tightened, we have seen an impact on greenspaces around developments. Where available, there is a greater emphasis on low cost, lower value planting that also undermines biodiversity. As climate change impacts increase, reinforcing the value of diverse green space, as part of our climate resilience approach is essential. Private development has a key role in maintaining and enhancing biodiversity and green spaces for users and communities. We will discuss some of the pull factors for places in the next section on place, however it is clear that attractive places include greenspaces. In our climate emergency they also provide opportunities for climate adaptation and biodiversity promotion.

NatureScot's Green Infrastructure Fund Projects are a good example of how green infrastructure is improving urban settings, to benefit communities. The knock-on effect on wellbeing and health will likewise support reduced public service reliance over time. Within the public service reform agenda, nature positive communities has to be part of the mix, including maintaining and promoting access to nature and outdoor space in social infrastructure. Scottish Government should therefore prioritise green spaces to support our places and the people within them.

Nature-based climate solutions

Mitigating and adapting to climate change is a significant challenge, impacting across our system of infrastructure and the places it supports. Yet our approach needs to be measured and nature positive. Firstly, nature-based climate solutions (NbS) should be the first port of call, ensuring that our nature is protected, and the often-high costs of mitigation and adaptation is balanced with this rich asset at our disposal. For example, there are emerging examples of nature responses to flooding, beyond moving assets inland. Instead, taking a world-leading approach to create a nature-led response should be developed. This builds upon current Climate Change Plan and SNAP3 ambitions. These approaches are often also

seen to be cost effective, as well as working with the local environment, minimising the disbenefits of traditional mitigation responses.

Beyond flooding, other NbS opportunities in Scotland include reforestation for carbon mitigation; biodiversity and re-planting support to protect from landslides and erosion; renewable energy to reduce energy emissions; and nature-inclusive design of new buildings including green roofs, and permeable surfaces, to adapt to changes and improve environmental quality. All of these examples whether micro and macro-level NbS, design a system-model with multiple benefits for climate and place.

This approach also provides an economic imperative. An International Labour Organisation publication in 2024 identified that investing in nature-based solutions has the potential to create up to 32 million new jobs globally by 2030, across ecosystem restoration, agroforestry and sustainable agriculture. With Scotland's rich assets and existing track record, it is well placed to exploit this opportunity.

Balanced ecosystem management

Decisions on the assets of our country need to be taken with a balanced long-term view, ensuring climate adaptation, wellbeing, biodiversity and economic use are carefully considered and balanced. For example, we need water to drink, for agriculture, for parks and greenspaces, and for industry, including hydrogen ambitions. Yet this is becoming a scarcer asset and increasingly in the wrong place.

In exploiting our rich assets, we need to understand how in using this asset we limit or cannot use it for something else, as well as ensuring we protect it against further climate and environmental impacts. Trade-offs are a consistent theme from our analysis. Understanding, detailing and being transparent about trade-offs helps ensure we make better decisions for the long term, as well as creating market certainty. This requires a better understanding of the interaction of our ecosystem.

Data and market frameworks

Managed by the Department for Environment, Food & Rural Affairs, in 2022 the UK Government established the Natural Capital and Ecosystem Assessment programme in England and Wales. This R&D programme is establishing a natural capital baseline to support policy and decision-making. Having established similar baseline data for sections of our natural capital, NatureScot is well placed to enhance the Scottish picture, including a better understanding of the interaction of different uses. Alongside this, further work should be undertaken to continue to evolve the Natural Capital Market Framework.

This directs on the opportunities of trading in carbon markets and nature and biodiversity initially, with other areas for future expansion. Understanding this within the context of an appropriate system baseline will help mitigate for any disbenefits in trading in our essential resources.

These activities should guide over the first half of this Needs Assessment both the capturing of rigorous data and guidance for decision-making.

� KEY MESSAGE

Touching on every area of our life while being a significant draw for international tourism, we have a collective responsibility to drive a nature-positive Scotland. Scottish Government, its agencies and local authorities should continue to lead on action, investment and regulation to manage the sometime conflicting demands on our natural assets. This includes balancing its use for climate mitigation and emerging energy technologies, ensuring biodiversity can continue to recover from historic challenges, while benefiting all of Scotland. Additionally, as part of this balance, emerging solutions to climate adaptation such as nature-based-solutions should become a preferred option, first amongst alternatives where there is clear value, while the wellbeing benefits of green spaces in our communities needs to be sustained and protected.

Enabling Success

Supporting Evidence

Prioritising place

Place and placemaking are concepts that support wellbeing and the needs of communities and business. They support a process of joined-up decision-making around local needs and outcomes. Place is a mechanism for change, which can connect public sector governance including local authorities and community planning partnerships, and communities. Local businesses may also come together in representative bodies to improve a place, to benefit business growth and attractiveness.

Many of our drivers combine within a place agenda, with resultant challenges and opportunities. For example, evolving demographics, significant sectoral changes as those developing in the energy sector, and public service reform including prevention measures, are likely to impact on our places.

> Supporting priorities within this changing world needs to be focused, with infrastructure reflecting the uniqueness of our places and local needs.

As we recognise the uniqueness of our communities, reflecting on how this guides infrastructure investment decisions needs to be further considered.

National vs. local decision-making

Understanding the best planning and decision-making level for our places is important. Places are often affected by decisions made at a regional or national level, with investment impacting on many places and infrastructure need. For example, a large economic investment within a region can draw people to the area for employment, changing pressures on housing and transport, or national investment in transport can

give business the confidence to invest. Places are not isolated but exist within larger spatial areas. We have increasingly developed regional governance structures and strategy in Scotland through City and Regional Deals, Regional Economic Partnerships and in due course Regional Spatial Strategies. It is important therefore that we find the right balance between local, regional and national priorities, removing unnecessary competition across our regions and places, while facilitating development.

> It is also important to ensure that places have a clear expression of need and related outcomes which guide how national and regional investment proposals respond to place-specific ambitions.

There are some areas where decision-making needs to be guided nationally, with regional implementation, such as significant economic infrastructure and growth opportunities, while decision-making regionally or locally to respond to nuanced local issues and opportunities is more

Enabling Success

Supporting Evidence

appropriate in other situations. There is unlikely to be a clear demarcation, however acknowledging the different economies and places we have in Scotland should support better decision-making and governance, creating better places. Where further regional governance is devolved, it needs to clearly consider how to manage this balance.

Place typologies

Scotland has developed a new Public Service Reform Strategy to guide how the public sector will re-shape services with communities and partners in our places. Prevention and behaviour change are both priorities to reduce demand on public services, as well as address long-standing negative impacts on wellbeing, supported by different ways of delivering interventions. As new service delivery models evolve, it is likely we will see these impact on how our places look and operate. There are benefits to developing a more considered framework of place typologies in the context of infrastructure. This should facilitate public infrastructure investment decisions, through understanding the role of these places. It should also consider the significance and role of smaller neighbourhoods within a larger place, with specific and challenging needs. A particular focus including prevention and early intervention can have a marked impact, emphasising the role of prioritisation of services, resources and infrastructure at the place-level that makes most sense.

Importantly, this approach does not necessitate equity of provision. A changing Scotland, with public service reform imperatives, is likely to see a different model of infrastructure investment, with some assets and services only being

available at a regional or national level. This will need to be balanced with historical challenges or under-investment in places, to support community viability and wellbeing.

> As we emphasise the uniqueness of our places, so should we recognise this also means a one-size-fits-all solution to our infrastructure or services is not always reasonable.

We need to build our understanding to direct investment more effectively, while acknowledging financial restrictions. Methodologies such as Scotland's Population Health Framework are likely to be valuable in supporting this understanding of need.

The National Planning Framework 4 (NPF4) provides a strong basis to develop this approach. It already has typologies of place, with the archetypes of sustainable places,

liveable places and productive places, with related priority national developments. Aligning with these typologies should be the first step, in combining Scotland's planning and infrastructure strategies. From here layering the impacts of demographic changes and public service reform need to be considered. The movement of people, the ageing population and the drive of public service reform should be considered systemically to minimise disbenefits and maximise the opportunity to change communities that have had consistent poor outcomes but are seen to be sustainable over the long term. The transition opportunities need to be clearly and consciously managed.

The ongoing regional development approach should also be reflected in these typologies, as it evolves. Again, the existing NPF4 provides a strong basis from which to further develop this approach.

Neighbourhoods

Within the evolving typology of places, there will be communities and places which require more specific and intentional collaborative working. The definition of what these places are, and the boundaries of where these places reach are very much dependant on local circumstances.

> Building a shared sense of the portfolio of neighbourhoods can drive better targeting of resources around a shared sense of need.

Flexible assets

Part of an effective and resilient place are assets that can flex and transform with change. We have seen sharing of assets within the public sector for some time, bringing together services that co-exist for the benefit of communities. This needs to continue, however as we will discuss in the next section, should be supported by robust data, in understanding how our assets operate for the benefit of our communities.

Building flexible public assets needs to be at the heart of any new build, providing multiple points of contact for communities, and the potential to evolve with those communities over time. This continues to be central to infrastructure in support of an efficient public sector.

KEY MESSAGE

Different things need to be done at different levels – national, regional and local. Scottish Government should continue to collaborate with local authorities and communities to evolve and develop clarity on the role of infrastructure within different places, establishing the necessary governance arrangements.

There are different types of place where infrastructure services will need to be delivered differently for communities in order to be sustainable, including greater travel distances for some services and potentially lower resilience standards where population density is lower. We must engage communities and be clearer on this, building on place typology work.

Infrastructure service providers and asset owners should come together more in planning and delivering for places, breaking down infrastructure silos, improving service delivery and asset utilisation.

Enabling Success

Supporting Evidence

Borders Railway

Improving tourism and rural accessibility through the re-establishment of a disused railway line.

LOCATION: The Borders

STATUS: Complete

ASSET AND CLIMATE RESILIENCE

PRIORITISING PLACE

The Borders Railway project revitalised the historic Waverley Route, restoring rail connectivity between Edinburgh and the Scottish Borders to boost tourism, housing growth and business investment.

Closed in 1969, the line was revived after a local campaign and a business case developed by three councils, gaining national support. Transport Scotland led delivery from 2008, with Network Rail and BAM Nuttall completing construction on time and within budget, reusing historic infrastructure.

Since opening, passenger numbers have far exceeded expectations. Ongoing plans include electrification, new electric trains and potential extension to Carlisle.

The £350m project delivered 30 miles of track and seven new stations.

Celebrating the 10th anniversary of the opening of the Borders Railway in September 2025, First Minister John Swinney said:

> The Borders Railway is more than steel and stations – it is a story of ambition, collaboration and resilience. Ten years on, it has exceeded expectations, connected communities, and laid the foundation for future growth.

FIRST MINISTER JOHN SWINNEY

Enabling Success

Supporting Evidence

Data and technology

The potential of data and technology for supporting Scottish priorities continues to grow. Our public services are innovating and exploring how digital technologies can support future public service delivery and the infrastructure services rely on.

Across our built environment, applications of new technologies are emerging that are disrupting and improving how we plan, deliver and manage our future infrastructure. These solutions are providing new insights and capability to better inform decision makers, improve collaboration and increase performance across the infrastructure lifecycle. From driving infrastructure development such as better evidence of how buildings and assets are used, to designing and constructing projects virtually before going on site to improve efficiency; understanding how people move around and use the places they live in to support better decision-making; and the very significant role for public service delivery, as part of the reform agenda. Alongside these clear infrastructure roles, is the potential for technology to make our businesses and public services more efficient, drive innovation and develop new markets.

Data insights

The data we hold, create and manage is a key asset and should be leveraged in a way to support our priorities and outcomes.

Data is recognised as unstructured, unprocessed and requires to be curated to become useful and in doing so become information that will provide the insights we need, supporting decision making. How we manage, share and derive insights from our data continues to evolve and

the importance of good information management provides a key foundation to the efficiency of our future infrastructure.

Data and Information management continues to develop, and how we share data to minimise duplication of data capture and stimulate technology development and innovation should also continue to be considered. The sharing of data enables innovation, accelerates change and fosters collaboration.

> Making data open source where there is no commercial or privacy challenges should be the norm and, effectively leverage this data across the infrastructure system.

National data standards need to be part of this journey, to capture data in a consistent way and shared in a format that allows interoperability between systems that enables different stakeholders to benefit from this key asset.

This requires leadership to effectively achieve consistency, while looking ahead to the wider opportunities better data may facilitate. For example, understanding the movement of people within key heritage assets and nearby local communities is likely to be important not only to the local authority and Historic Environment Scotland, but also the Scottish tourist industry that have identified effective use of data and technology as a sector priority, including its role to understand consumer behaviour for sector development. Understanding similar use cases and making that data available holds value beyond the immediate needs.

The journey to smarter infrastructure is being accelerated by AI and machine learning. These technologies provide an opportunity for our existing and new data to be more effectively analysed and used. This includes the use of data for scenario modelling and projecting of future need, as well as the design, construction and facility management of our infrastructure. Integrating this opportunity as part of our data management approach should help with a more efficient data use system.

The value of data in the Scottish public sector to support effective planning has long been recognised, as detailed within the Scottish Government's Digital Strategy for Planning. This includes defining and implementing a data ecosystem approach with defined standards, data governance and operating model, recognising data is an asset. Re-energising this strategy with its detailed actions would support many of the place evidence opportunities we have identified in our analysis.

Smart infrastructure

Never before has technology offered such opportunity. The growth of new solutions and approaches to connect our buildings and networked infrastructure to digital models and analytics tools, allows our infrastructure to become smarter. Commonly referred to as "smart infrastructure" this new capability will improve the performance of our infrastructure, to ultimately improve the outcomes we seek to deliver. The creation of smart infrastructure is developing quickly, and new approaches are being introduced to provide new insights, intelligence and remote interaction with our infrastructure.

We have seen innovation in the use of Internet of Things (IoT) enabled sensors and devices to monitor infrastructure such as buildings and utilities in real time to support asset management. This is expanding to combining of assets and their use to create smart places, with the potential to guide on investment priorities in our places. This is not yet ubiquitous, and often limited to specific assets supporting ambitions such as transport integration, however has significant potential.

In the context of public service reform and in particular health services, sensors and devices are likely to have an important role, allowing for autonomy in the home where this is preferred, and supporting greater efficiency of service delivery.

Translating the data provided by sensors and devices through effective models to establish use cases will be important. Digital twins are one such model, which creates a virtual replica of physical infrastructure, allowing planners, engineers, through to facility managers, to model, test, and optimise systems before implementing changes in the real world. This has the potential to significantly reduce costs and risks associated with construction and maintenance. A number of public and private infrastructure providers have developed digital twins, often modelling decarbonisation and system resilience options, such as the TransiT hub for transport, or SP Energy Networks digital twin. Continuing to roll out the use of the IoT will be important. This includes understanding our places through the development and use of data that helps align place design with local community and business priorities.

Technology innovation

There are immediate opportunities in data and technology, building upon the IoT and rich data it provides. However, technology development continues and has a significant role in both our economy and communities. As connectivity improves across the country, there is the potential for remote operation and management of infrastructure. It is likely to also have a significant role in the energy transition, and through smart grids in addressing the grid resilience challenges that increased renewables creates. Likewise, the circular economy sector will be supported by advanced data tracking and material management systems.

> Each sector is likely to have opportunities through ongoing technological innovation. Ensuring this can be stimulated effectively, by creating the best conditions for innovation will be important.

Addressing the balance

Alongside the new data and technology opportunities, there are also challenges, such as cyber security and data privacy, balancing the individual and the whole. New initiatives such as the Centre of Excellence for digital trust, that brings together industry and academia, will have a key role to inform this balance, as does the existing National Cyber Security Centre and forthcoming Cyber Security and Resilience Bill. In a time of global insecurity these challenges must be addressed. Additionally, ensuring

that all of society benefits from the technological developments will be essential, recognising how technology has an increased role in social cohesion and opportunity.

The Gemini Principles developed by the Digital Twin Hub provide a helpful framework to place purpose, trust and function at the heart of strategy for data and technology-enabled infrastructure. At present across industry there is a system of initiatives, data standards, best practice and policy priorities driving digital change across our built environment. Where leadership and co-ordination can be improved nationally this will support assets owners in their journey, accelerate needs-led investment and enable Scotland to realise the benefits of data and technology sooner across our infrastructure.

The public and private sector each have a role to exploit the immense potential of data and technology in our infrastructure system. Scottish Government should facilitate greater data development and use, to support effective evidence-based decision-making including asset management. This includes open-source data, with the necessary governance, operating model and standards to achieve the value of data sharing and its use across economic, social and environmental priorities.

All asset owners and managers should have a data strategy alongside their asset management plans for both new and existing assets. Investment cases should consider the opportunities for data and technology, to optimise asset utilisation and lifecycle maintenance, as well as for design and construction.

Re-visiting the value of the digital strategy for planning would support many of the opportunities we have identified in our analysis. Public-private collaboration to support smart infrastructure development, which is fit for purpose in facilitating service redesign, alongside solutions for an ageing population, will be important. This is likely to include using public sector levers and creating clarity to stimulate continued innovation in technology, with effective use cases an important addition to enable growth in this sector. As technology and the use of data become more integrated into our lives, ensuring inclusion and safety including cyber security should be carefully considered, ensuring all of Scotland can benefit from ongoing innovation.

Enabling Success

Supporting Evidence

Asset and climate resilience

Asset longevity and flexibility

We have noted that 80% of our current infrastructure systems will likely still be in use in 2050, with many of these assets in the public sector. We are therefore not starting from a low asset base.

However, with significant drivers of change impacting on need alongside existing challenges, whether these assets are still fit for purpose or in the right place for the long term needs to be considered. Where we anticipate transitioning needs but not immediately, managing existing assets needs to be part of plans.

> Within the public sector, there are significant backlog maintenance challenges, alongside a desire for reform that will rely on different delivery models and therefore assets in some sectors and geographies.

This includes the increased role of data and technology as well as a focus on prevention to reduce the pressures in areas such as health and care. Some of these changes will however take time to develop, while the assets continue to require maintenance and demand continues to increase. Managing existing assets as public service reform is underway will require careful management, balancing interim-investment and ensuring assets are flexible and resilient.

Many of our assets will need to continue beyond their intended lifespan to support reform and the managed transition. The public will need to be engaged in this conversation to address any concerns and opposition to any perceived lack of investment, as new delivery models are developed. These decisions will not only affect public service assets but also supporting infrastructure.

Investment hierarchy

An existing model for supporting the balancing of public investment over the longer-term is the investment hierarchy, a recommendation of the Infrastructure Commission for Scotland and first published by Scottish Government in the Infrastructure Investment Plan (2021-22 to 2025-26). This is included as Figure 8.

It is proposed that this hierarchy is even more relevant when we look at the current pressures and anticipated drivers of change and should continue to be central to investment decisions during this time of transition.

Figure 8: Scottish Government's Infrastructure Investment Hierarchy

Scottish Government Investment Hierarchy

Determine future need
Consider appropriate infrastructure needs and demand in light of net zero carbon and inclusive growth priorities, changes in service design, availability of digital platforms and technological innovation, and resilience in light of population and climate change forecasts.

Maximise the useful life of existing assets
Maximise adaptation, repair and maintenance of existing assets.

Repurpose & Co-locate
Reconfigure or repurpose existing assets, giving preference to co-location or shared facilities.

Replace, Create or Build New Assets
Consider suitability and sustainability of new assets.

Enabling Success

Supporting Evidence

Climate and external resilience

> Climate resilience has to be at the forefront of any infrastructure priorities, recognising that irrespective of mitigation efforts, we are facing significant need for adaptation.

Forest fires, coastal erosion, increasing temperatures impacting on infrastructure, landslides, flooding, biodiversity loss, the list is extensive. In 2022 SEPA identified the expected annual cost of flooding impacts as around £260 million, which is likely to increase with climate change. The cost of flooding is felt by the individual, through damaged homes and livelihood, often increasing insurance, and by the public sector through assets needing replaced and service delivery being undermined. It also further undermines our natural infrastructure and biodiversity.

As already noted our approach to adaptation should be measured and nature positive, with nature-based solutions (NbS) the first port of call. Beyond NbS, new technology, legislation and regulation should continue to be developed to address issues such as the effects of heat on our transport network, telecoms and existing buildings.

We already have adaptation plans for much of our infrastructure. Translating these into clear action plans, over the life of this Needs Assessment is a necessary next step.

> Aligning and prioritising investment creates transparency needed for investors and communities.

As the analysis has shown, we understand the issues, we know many of the solutions, the challenge is implementation.

Asset resilience is not only about climate adaptation but also protecting and hardening our assets to negative external influences. We have seen the challenges of global insecurity and how geopolitical tensions, economic instability, and pandemics, are likely to pose ongoing risks to parts of our infrastructure. For example, the Covid-19 pandemic highlighted the vulnerabilities of healthcare systems to global health crises, and lessons learned from that experience will shape future planning and preparedness. Strengthening our systems to external threats is essential, including considering how through contingencies and supply management, and other resilience measures, we can ensure our infrastructure is protected and robust.

KEY MESSAGE

The public sector focus on public service reform should seek to balance the challenges of ageing assets and backlog maintenance with changing modes of delivery and therefore infrastructure need. This is likely to require significant flexibility in asset management and development, with public engagement suggested to be essential to address transition concerns. The evolving demographic also needs to consider population location and enabling infrastructure, reviewing what is needed not only for existing population, but for the future, recognising the long-term nature of infrastructure. Minimising stranded assets while stimulating private investment will be an important balance. To support a strategic approach the infrastructure investment hierarchy should continue to be a core component of public sector decision-making, while climate resilience and managing global security and emerging risks through strengthening infrastructure systems will likewise require sustained and clear action.

Enabling Success

Supporting Evidence

Demand dynamics

We have discussed the demand and related financial pressures on many aspects of our public services, with public service reform having the potential to reduce demand, while improving outcomes. Prevention for example is a key demand management tool, however it sits alongside better integration of services to create greater system efficiencies while improving outcomes, and using time-shifting demand management approaches.

Climate change pressures are another reason for seeking to reduce demand in areas such as water use, recognising our natural assets are both being affected by climate change but also are a key but finite resource to be used wisely in adapting to climate impacts. We also have ambitions to reduce car usage, yet have a long-standing attachment to our cars and in some areas this is likely to continue due to fewer alternatives. Low and zero-carbon cars may address some of the reasons for this ambition.

> Demand and our objectives around promoting reduced demand is therefore likely to be fluid as new technologies and options emerge.

Time-shifting options to maximise asset utilisation and therefore manage peak demand, such as smoothing peaks and congestion in transport, or making better use of social infrastructure throughout the day and not only at certain core times, should also be continue to be used and expanded in parallel with service and staffing design.

Sitting alongside reducing demand in some areas is an agreement on where the trade-offs sit and what the public would prioritise within restricted finances. This may include different

trade-offs across the country, recognising the uniqueness of our places and experiences.

Behaviour change

In addressing demand challenges, it is suggested that behaviour change should be an explicit area of focus. Whether that be improving health through greater health education and accountability, reducing water usage through increasing the public profile of issues, reducing waste through better consumption patterns and recycling behaviours, or changing travel patterns to include more active travel modes, or support

time-shifting approaches. These are not changes that are easy or immediate, influenced by long-standing societal attitudes and in some cases exacerbated by complex socio-economic barriers.

> Behaviour change however needs to be part of the approach to reducing poor outcomes, alongside managing rising demand on services.

In the health sector we already have some of the platforms, such as the Scottish NHS Inform and English Live Well, providing extensive

access to information, alongside empowerment models such as [social prescribing](#), however the barriers to change remain and new approaches need developed. Each public sector stakeholder should consider how prevention and behaviour change can affect positive changes for the individual and society.

A national conversation

As we have seen, infrastructure is a system of systems, therefore demand and public opinion has an impact across sectors, whether that be the demand on all natural resources, or specific challenge areas. Public service reform and managing ageing assets as services evolve, often requiring interim solutions, is likely to be a concern for the public. Nationally, exploring demand challenges, their impacts and the evolving model of public services would be valuable. Discussing trade-offs and therefore priorities should be a key component of this exploration. Through engagement and ongoing conversation in our communities and beyond, possible benefits are significant, creating a greater understanding of the demand challenges, but also the significant opportunities of reform.

> **⬎ KEY MESSAGE**
>
> The public sector should establish a programme of public education to support positive behaviour change, to manage increasing demand on services and assets, and improve service outcomes through prevention practices. This includes promoting an understanding of related policy priorities such as climate mitigation which require effective resource management. A national conversation on demand challenges and public service reform is encouraged, creating a greater understanding of issues and confirming public priorities in the context of trade-offs.

Enabling Success

Supporting Evidence

Stornoway Deep Water Terminal

Multi-purpose port infrastructure enabling cruise growth, freight and renewables logistics.

LOCATION: Stornoway, Isle of Lewis

STATUS: Current ●

📈 ASSET AND CLIMATE RESILIENCE

⊜ ENERGY TRANSITION

The Stornoway Deep Water Terminal, delivered by Stornoway Port Authority (SPA), is a multi-purpose port facility on the Isle of Lewis capable of berthing vessels up to 360m, with a dedicated freight ferry berth and 6.5 hectares laydown area.

Opened to cruise traffic in April 2024, it supports cruise tourism, freight logistics, and renewable energy projects, including a 1.8GW high voltage direct current interconnector by 2030.

Funded through a £49 million public-private partnership via the Scottish Government's Green Growth Accelerator (developed by the Scottish Futures Trust), Highlands and Islands Enterprise, SPA, and local authorities, the terminal integrates multi-sector use, maximises local supply-chain opportunities, and delivers inclusive economic growth while diversifying the Outer Hebrides' economy.

> The record number of ships that have arrived shows the growing popularity of the Outer Hebrides among cruise operators and their customers. It's fantastic to see so many people from around the world arriving here to experience the unique hospitality and culture of the islands. And it is bringing a very welcome boost to many businesses in the islands. This level of activity gives everyone here a taste of things to come as we look ahead to more and larger ships coming to Stornoway following the opening of the Deep Water Terminal.
>
> ALEX MACLEOD, STORNOWAY PORT CHIEF EXECUTIVE

Enabling Success

Supporting Evidence

06
Enabling Success

Enabling success

Enablers

We have identified the main drivers that will impact on a future Scotland, and considered these against our infrastructure sectors, while also assessing the key cross-sectoral opportunities and challenges.

Reviewed as a system, this brings into focus the cross-cutting themes Scotland needs to address, to create a resilient and effective infrastructure sector. Moving from understanding to implementation however can be a difficult road. Yet, we already have a strong understanding of what enables successful delivery of infrastructure.

As Scotland's infrastructure centre of expertise, the Scottish Futures Trust has worked with partners across Scotland to understand these enablers, including through engagement in preparation for this Needs Assessment. This section explores these enablers, illustrated in Figure 9, building on good practise in infrastructure decision-making and implementation across the infrastructure lifecyle.

Figure 9: Enablers for success

Underpinned by
GOVERNANCE AND PARTNERSHIP
PUBLIC ENGAGEMENT

Strategy

The basic requirements for a long-term infrastructure strategy is to determine long-term infrastructure needs through consideration of future conditions, drivers, and constraints to infrastructure investment.

Combining this with an understanding of the current asset base can support the development of a high-level plan that will enable evidence-based and effective infrastructure investment and delivery. As highlighted in this Needs Assessment, the complexity and scale of change in the infrastructure landscape over the next 30 years is substantial and the strategic basis for decision making will need to adapt to meet those changing needs.

Needs based asset strategies

This long-term system wide decision-making approach, will need to be underpinned by comprehensive, service or needs-based asset strategies.

All organisations – whether in the public, private or third sectors – should be seeking to develop evidence-based and robust asset strategies across their infrastructure portfolios.

There is a clear need to ensure assets are fit for purpose to enable business continuity within existing funding constraints. However, to inform a decision on whether to maintain, enhance, decommission or replace any given infrastructure, it is also imperative that this shorter-term requirement is augmented with a long-term view of infrastructure asset requirements informed by drivers of change including future service needs, or operating models both in terms of scale, design and geography.

Enabling
Success

Supporting
Evidence

Scottish Government introduced an "Investment hierarchy" as part of its current Infrastructure Investment Plan, as described in Section 5. The development of a consistent and standardised approach to the development of asset strategies which embeds this investment hierarchy, will support improved visibility of long-term infrastructure needs and prioritisation of investment. Work to establish these asset strategies across the public estate needs to be accelerated to ensure that long term investment needs can be clearly established, but also to ensure that short term investment decisions can be undertaken on a "no regret" basis.

To address infrastructure system complexities and to determine cross sector efficiencies, asset sharing and management of ageing assets versus long-term changes in infrastructure, need aligned to drivers of change, creating a clear pathway from existing to future infrastructure. A place-based approach to the development of these asset strategies, bringing together all public bodies in an area, also needs to be formally adopted, aligning investment around need and developed place typologies.

Prioritisation approach

Long-term infrastructure priorities must align with national, regional, and local goals. Strategic prioritisation provides the mechanism through which Scotland ensures that investment in infrastructure both meets current needs and anticipates future demand. It is the process that determines which infrastructure proposals best support national strategic objectives, strengthen existing systems, and create the enabling conditions for sustainable future growth.

Scotland's infrastructure choices over the next three decades will determine the country's capacity to achieve a net zero, nature-positive, and inclusive future, key policy priorities which continue to influence infrastructure investment. Strategic infrastructure prioritisation provides the structured approach through which Scotland identifies and prioritises investment to deliver the greatest long-term public value: economically, socially, and environmentally.

The scale of change highlighted in this Needs Assessment increases the imperative to make informed prioritisation decisions that are able to better consider the risks and opportunities associated with system wide interdependencies and synergies; the current focus on project or even sector-based assessment will need to be enhanced to ensure that decisions across the entire infrastructure system can be more effectively made. To address this requirement, each proposed intervention or system enhancement that will inform the infrastructure pipeline development and spending review decisions should be assessed against the following dimensions:

- **Strategic alignment** (based on a multi-criteria approach, to be developed and refined)
  - Extent to which proposal addresses the drivers and cross-cutting themes identified (within wider infrastructure system).
  - Extent to which proposal aligns with a sector asset strategy.
- **Value for money**
  - Consideration of lifecycle cost, public benefit, and long-term fiscal sustainability including potential to leverage wider investment include explicit reference to long-term asset strategy ambitions.
- **Deliverability**
  - Including technical feasibility, planning maturity, procurement approach and deliverability across the public sector and supply chain.
  - Also considering spatial distribution, project scale distribution and the delivery balance across both the public and private sector markets.

Priority infrastructure systems

Each infrastructure sector is embedded within a particular context or system. Our assessment has identified several infrastructure systems that are most likely to change in terms of scale and form over the next 30 years, requiring a change in emphasis:

- **Energy transition infrastructure** including renewable generation, grid modernisation, and storage, underpins progress toward net zero and energy security.
- **Nature-based and climate resilient infrastructure** strengthens the nation's capacity to adapt to extreme weather and supports biodiversity recovery.
- **Data and technology infrastructure** enables innovation, public service transformation, and productivity gains across all sectors.
- **Resilient, low-carbon transport systems** provide equitable access and underpin regional connectivity.
- **Water and wastewater resilience** ensures secure, sustainable management of essential natural assets.
- **Place-based social and community infrastructure**, including targeted public services, housing and green spaces, that sustains healthy and inclusive places.

Prioritising investment within and across a system approach is vital. Some projects (such as grid transmission and distribution innovation) act as enablers for later investment and should be considered for early prioritisation. A system approach ensures value for money and creates broader opportunities for societal and economic impacts beyond a narrower focus. It also supports identifying any disbenefits, a key challenge in a complex infrastructure system. Through a prioritisation approach, including assessing the potential for cross-cutting system enhancements and risk management, system benefits can be achieved.

This approach would be augmented through the Needs Assessment review cycle every 5 years, to ensure responsiveness to changing needs, technologies, and global conditions.

KEY MESSAGE

Scottish Government should accelerate the preparation of needs-based asset strategies to guide investment decisions in a time of change. These should support a clear pathway from existing to future infrastructure, aligned to drivers of change and public service reform priorities, alongside a place-based model of need. Prioritisation of infrastructure investment should be transparent, supporting the scale of change anticipated, aligned to the principles and analysis in this Needs Assessment, alongside value for money, and deliverability and readiness. A system model of prioritisation needs to also reflect on the infrastructure systems and the role of enabling infrastructure.

Enabling Success

Supporting Evidence

Investment

Scotland's infrastructure landscape is characterised by a broad and diverse range of projects, and whilst large scale projects are evident, many are small in scale and locally focused, for which it is difficult to attract large-scale investment.

This requires innovation including community-led initiatives and packaging of small projects to address. Alongside innovative packaging of opportunities however, the requirement for national level multi billion pound investments will still be essential to meet the scale of change anticipated over the next 30 years.

This Needs Assessment has not sought to establish the sources nor scale of investment over its 30 year horizon, however, irrespective of source or scale, it is important to recognise that:

- **Any asset ultimately has to be paid for (or funded) either as it is built or as it is used.** Funding for infrastructure assets come either from public sector budgets, or from consumers in the form of user/occupier/developer charges.
- **If the asset is paid for as it is used, a form of finance (which comes with an expectation of repayment) can be raised to build the asset.** Financing can be either public sector borrowing or private debt/equity financing.

As a historic norm, most social infrastructure in Scotland (health, most education, justice, emergency services and culture) has tended to be funded from public sector budgets. Publicly owned economic infrastructure is funded through a mix of public sector budgets, such as transport, and consumer funding which is publicly financed, such as water. Other economic infrastructure including airports, energy generation, transmission and distribution, and telecoms are primarily funded from customer charges although specific UK and Scottish Government funding has also been invested in all of these sectors in recent years. Sub-categories of housing and natural infrastructure are funded either by governments or users, depending on social or market purpose that they fulfil. More information on infrastructure ownership and funding is provided in Table 1, Section 4.

As highlighted elsewhere, the potential for innovative approaches to funding and delivery such as road pricing or congestion charges in transport may need to be reviewed, reflecting increasing financial pressures and investment need.

Principles to enabling private investment

Below we have set some key principles that should be addressed by the public sector to establish the appropriate investment environment over the next 30 years.

The key elements which require to be in place to attract private investment for new infrastructure investment approaches, in addition to the general conditions for investment, of a well-functioning economy and stable legal regime are:

- Clarity of the ultimate funding source – either that it is government policy that taxpayer pays, government regulation, government incentivisation through co-funding the asset, or financial support to individuals or market conditions where the consumer pays.
- Available technology to deliver the infrastructure service that is required.
- Resources and supply chain to deploy the technology.
- Attractive market conditions to deploy in Scotland rather than elsewhere.
- The signalling and transparency to investors and the financial intermediary marketplace.
- More detailed structuring of individual investment opportunities when identified to make them market-ready and fulfilling investors needs for a minimum scale.

Globally mobile capital and market confidence

Attracting investment remains vital for delivering large-scale infrastructure ambitions. Efforts should focus on channelling investment strategically, building on Scotland's existing strengths and track record, with agency collaboration to create a clear message. The challenge of short-termism in investment is understood, however there is a need to incentivise and encourage patient capital and long-term partnerships that align with the 30-year vision.

Enabling Success

Supporting Evidence

> The public sector has a vital role to play, providing policy stability, clear strategic direction, and early-stage funding (e.g. feasibility studies) to attract and crowd-in private investment.

The Scottish Government currently has a range of investment levers available to it, depending on funding source. For example where tax funded, Scottish Government must prioritise capital budgets, and consider use of public/private finance and long-term revenue funding to deliver additional investment. While for consumer funding, Scottish Government must work with devolved powers and with UK Government (UKG) on regulatory regimes which balance investability, policy priorities and consumer protection, and use blended public funding/financing support to catalyse emerging markets and address market failures (especially geographic).

For some reserved areas, there is a significant reliance on the borrowing capacity and market leverage that the UKG can call on. The recent rating of Scottish Government Bonds is a positive step, although does not at this stage increase the overall quantum of borrowing available. There does remain the potential to further explore the use of instruments to create additionality, such as implementing user charges, providing lending below commercial rates, and seeking to increase borrowing powers.

However, any new intervention to increase investment through consumer charges should be considered in aggregate across portfolios and infrastructure asset classes, to maximise coherence and ensure that the burden on consumers, especially from lower income groups and those in fuel poverty, is considered in the round. Consideration is also required as to whether any new user charge is being considered as a replacement for an existing tax (e.g. fuel duty) or an additional charge to consumers out with general taxation; and the extent to which those matters are devolved and/or reserved.

Prioritisation of infrastructure investment remains crucial, particularly in the context of recent capital budget allocations, while the use of government financial instruments for infrastructure assets, versus attracting corporate inward investment, should be considered. Whilst a range of instruments and models is available, careful review is required in assessing the governance and capacity for their use. Furthermore, the market environment, including the cost of finance, must be factored into the selection and application of these models. Any new efforts and models will require clear co-ordination and clarity on objectives.

Co-ordinated policy and regulation

It is recognised that regulatory bodies face pressures around pricing and affordability, and if our future infrastructure is to be delivered, it must be balanced with the need to unlock long-term investment and innovation.

> Our engagement has indicated that regulation should be focused on enabling infrastructure with clearer alignment between policy intent and regulatory mechanisms.

Greater coherence and flexibility would enable policy and regulatory frameworks to be more responsive and joined-up across infrastructure delivery. Effective dialogue and shared frameworks for infrastructure planning and regulation would strengthen delivery and promote cross-border investment, and enhanced policy alignment between the Scottish and UK Government (and among the devolved nations) would provide clarity and confidence for both industry and investors.

⌄ KEY MESSAGE

Scottish Government should drive opportunities for private investment, by creating an appropriate environment including clarity on investment pipelines and funding, strategic direction, a transparent policy and regulatory system, supply chain development and signalling readiness to deliver. Unlocking enabling infrastructure, including cross-border infrastructure through greater collaboration and regulatory alignment with policy is encouraged. Scottish Government should also consider the potential for innovative approaches to finance and delivery such as user charges and government financial instruments, recognising the significant financial challenges in delivering future-proofed infrastructure.

Enabling Success

Supporting Evidence

Delivery

Our delivery approach determines how ideas and strategies translate into real, functioning assets that serve communities, support industry, and protect the natural environment. The way infrastructure is delivered and managed in Scotland will be central to achieving its long-term objectives.

Over the next 30 years, Scotland's infrastructure system will need to respond to the opportunities and challenges presented by accelerating technological change, the decarbonisation of energy and transport, growing climate risks, and the increasing importance of place-based and nature-positive investment. These will require delivery approaches that are flexible, outcome-focused, and capable of fostering collaboration between public, private, and community sectors. The construction sector will need to adapt in response to a programme of investment across sectors.

> An innovative and modern approach to delivery must create long-term value – economic, social, and environmental – while ensuring that Scotland's limited resources are used effectively.

Delivery models need to promote trust, innovation, and resilience throughout the supply chain. Effective delivery can act as a strategic lever for achieving Scotland's broader policy goals. NPF4, Scotland's spatial plan to 2045, supports the long-term aim of aligning infrastructure and spatial planning, as part of effective delivery.

Construction pipeline and procurement

Procurement is a powerful lever available to the public sector for shaping markets and influencing outcomes. In the context of national infrastructure, it should enable long-term, system-wide objectives rather than discrete project transactions, including shaping and facilitating a robust construction sector. Effective procurement signals and delivery provide the structure through which Scotland can:

- Align infrastructure investment with economic, environmental, and social priorities.
- Build confidence within markets by offering clear visibility of future demand.

- Encourage innovation, digital adoption, and modern methods of construction.
- Ensure accountability, transparency, and fairness across public and private sectors.

> By approaching procurement and delivery as a system rather than a process, Scotland can better integrate infrastructure planning with spatial strategy, funding, and community outcomes.
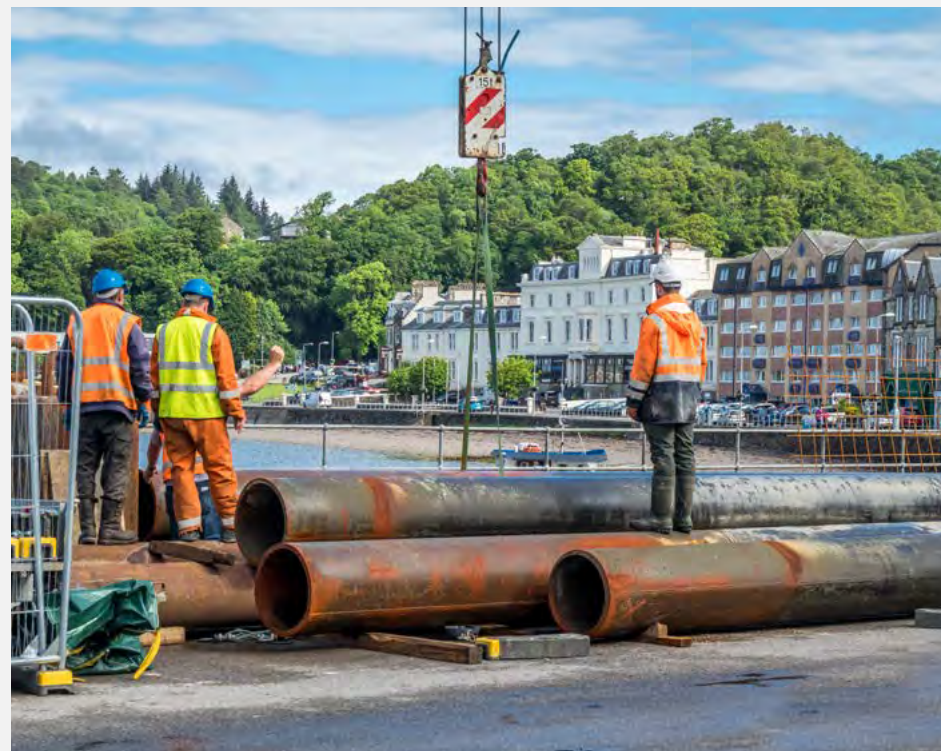
Developing programme-level structures and methods of aggregation for recurring or smaller-scale infrastructure could also help streamline delivery and address investment barriers. Ensuring proportionate regulation and clearer routes to market would enable local authorities, social enterprises, and community bodies to participate more effectively.

Transparent objectives and pipeline clarity over the longer-term is also important to send clear market signals to both investors and the construction industry, which is structured to support different markets of civil, building, house building and repair, maintenance and improvement, as well as operating in different geographical locations. With significant changes in the public sector anticipated, creating clarity for the construction industry can help it evolve with these changing needs, maximising positive impacts.

Strategic coordination across multiple levels of government, between subsidy control, procurement policy, and investment planning, will ensure decisions are coherent, and the market primed, ensuring ambitions are deliverable.

Construction and delivery quality

It is important that delivery incorporates and supports design which is sustainable and improves people's lives; produces quality construction to the required standard; and achieves the outcomes for clients, industry, workers and asset users. New technologies including offsite construction are supporting this drive for quality, facilitating the delivery of consistent, high-performing, and sustainable buildings.

Good progress is being made in the drive for a construction sector that is innovative and delivers Value for Money, as set out in the Construction Leadership Forum's Construction Accord; and it is imperative that both the public sector and industry build on this – with a shared vision for the future interface between the public and private sectors, emphasising fair work, digital adoption, and value-based outcomes – in order to be able to deliver our long term infrastructure needs.

A key component of improving both construction and delivery outcomes, is appropriate evaluation including Post Occupancy Evaluation. This relies on consistent data, establishing line of sight from objective-setting to assessing impacts following completion, requiring the early engagement of all stakeholders. This type of feedback loop is essential to support continued improvement in delivery and should be embedded in construction projects.

Capacity building and readiness

Ensuring Scotland is prepared for new and emerging technologies and is equipped to respond effectively to future infrastructure challenges is a fundamental enabler of success. To support this there will be a requirement to invest in skills, systems, and institutions capable of adapting to change and managing complexity across sectors. There is a need for learning pathways to be developed that reflect current skill and workforce shortages alongside future requirements that could be enhanced through stronger collaboration between universities, research institutions, and industry, to translate innovation and research into practical application. This should be further augmented by building delivery capability and capacity, particularly within local authorities and community bodies, to support successful client delivery pathway.

⟳ KEY MESSAGE

All stakeholders need to focus on effective and quality delivery to ensure strategies translate into real functioning assets that meet objectives, delivering value. The public sector should create transparency in construction pipeline and procurement intent over the longer-term, to help build market confidence and allow the construction sector to structure and evolve for infrastructure investment needs. Procurement approaches should include opportunities for aggregation of smaller scale investments, to make viable, while ensuring regulation is proportionate. The construction sector should continue to drive quality, while feedback loops to support continued improvements should be integrated into all projects. To aid transition and integration of new technologies, learning pathways should be developed to ensure skills are robust and reflect market need, supporting quality and value for money.

Enabling Success

Supporting Evidence

Management

With 80% of our current infrastructure systems likely still to be in use in 2050, managing those assets is essential. For the public sector this will increasingly require a consideration of short to longer term asset need and management, as services evolve and likely require sustaining assets beyond their anticipated lifespan. There are a range of tools available to create greater efficiency in asset management, including smart infrastructure, supporting predictive maintenance.

With assets often integrated within communities, asset disposal and reuse needs to reflect the broader role of assets within places, and therefore the ability to create added value.

Making best use of assets

Robust asset management plans should always be central to effective decision-making on asset use and investment. These consider:

- Asset viability.
- Asset sustainability.
- Asset-specific criteria e.g. needs of a specific user group.
- Relationship to asset strategies, reflecting long-term vision.

We have seen that in the public sector there is a significant issue with ageing assets and backlog maintenance. This is likely to impact on both the viability and sustainability of assets. However equally, understanding the long-term vision will also influence asset management decisions. Whether services will be redesigned to support public service reform, or whether there is the ambition and potential to co-locate, are important considerations to guide short term asset management.

Asset management plans will also need to embed a response to climate resilience and the pathway to Net Zero, reflecting these in maintenance activities and broader asset management decisions.

> For many of our assets, public service reform will create the need for tactical management of ageing assets, recognising future services are likely to require a different infrastructure model.

When assets are at the end of their life or co-location makes assets surplus, both social and environmental criteria should be included when identifying appropriate disposal route. This should explicitly include the added value to the community and other public services and not only the financial return of commercial disposal.

Management tools and practice

We now have an increasing number of tools to support effective asset management, including digital twins and smart technology such as sensors. Through effective use, digital tools can direct predictive maintenance, energy management and optimise asset utilisation. Through supporting skill development in new technology and consistent behaviours we can help drive efficiencies in asset management.

Practises such as service integration and co-location can also be supported by technology. By establishing the right kind of systems such as shared digital booking systems, security and access control and cross-charging, under-utilised assets can be more effectively used.

KEY MESSAGE

Asset operators should ensure asset management plans are common practise, reflecting current viability and sustainability within a broader understanding of longer-term vision. In the public sector asset management plans should guide on managing the risk of ageing assets and backlog maintenance. Through the effective use of smart infrastructure, assets should be more efficiently managed, including predictive maintenance programmes; and co-location more easily facilitated. All stakeholders should consider asset disposal in a place-context, ensuring community and other benefits are realised.

Enabling Success

Supporting Evidence

Governance and partnership

Infrastructure governance provides the functional environment required to plan, fund, deliver, and manage Scotland's infrastructure over the long term. It brings together strategic prioritisation, policy and regulatory frameworks, resource capacity, and transparency considerations that collectively ensure maximum public value for money is achieved.

Governance encompasses every stage of the infrastructure lifecycle across strategy, investment, management and delivery.

It establishes how priorities are aligned with the commitments set by the 10-year Infrastructure Strategy including the transition to net-zero, driving inclusive growth and building resilient and sustainable places. It enables meaningful integration across sectors such as energy, transport, water, and telecommunications, where interdependencies and synergies increasingly impact investment prioritisation and wider system performance.

Effective governance structures will be imperative as major transitions advance and the needs of infrastructure in Scotland evolves, including achieving net zero emissions, creating the resilience to adapt to more frequent climate impacts, and securing greater digital integration across assets. The role of governance is to provide the certainty and capability needed to respond to these pressures while also maintaining essential services and infrastructure functionality when assets are under pressure.

Structural alignment

Effective governance and partnership models are key to align investment, policy, and delivery across multiple sectors. Collaboration between national, regional, and local actors can help overcome silos and unnecessary competition, and promote coherent, place-based decision-making. Stronger cross-sector partnerships (public, private, and community) will enhance coordination, resource sharing, and innovation.

Long-term decision making requires shared risk, shared investment, and shared accountability across decision makers and industry.

Infrastructure governance within public bodies needs to quickly adapt to reflect the system wide interdependencies and synergies that have been identified in this Needs Assessment. Collaboration across sectors can also deliver shared benefits, reduce duplication, and leverage co-investment opportunities. This change is required to enable more effective investment prioritisation and policy development to be made, that cut across current governance structures and portfolios. Scottish Government should lead the way by aligning public sector governance structures to support local ambitions, while creating cohesion across regional and national priorities; and stimulating increased collaboration across sectors and geographies.

⊘ KEY MESSAGE

Effective governance and partnership models should be the norm, to align investment, policy and delivery across multiple sectors. Scottish Government should lead the way by aligning public sector governance structures to support local ambitions while creating cohesion across regional and national priorities. This includes transparency on national versus regional roles and directing opportunities for risk sharing to stimulate regional investment that aligns with national ambition.

Enabling Success

Supporting Evidence

Scotland-wide Grid Upgrade (SSEN Transmission & SP Energy Networks)

CASE STUDY

Strategic transmission reinforcements enabling net zero and unlocking offshore wind.

LOCATION: Scotland-wide

STATUS: Current ●

ENERGY TRANSITION

PRIORITISING PLACE

DEMAND DYNAMICS

The Scotland-wide Grid Upgrade, led by SSEN Transmission and SP Energy Networks, is a strategic programme to reinforce electricity transmission across Scotland, enabling rapid integration of renewable generation, particularly ScotWind's 30GW of planned offshore wind energy, into GB demand centre networks.

Guided by NESO's Holistic Network Design and the Beyond 2030 plan, and accelerated under Ofgem's Accelerated Strategic Transmission Investment framework, the programme involves multi-billion-pound investments in circuits, substations, and high voltage direct current links.

Key projects, such as the Skye Reinforcement, are under construction, while domestic supply chains are expanding. National Development 3 status, Clean Power 2030 alignment, and community-benefit funds support regulatory certainty, investment mobilisation, and socio-economic benefits throughout the transition to net-zero electricity.

Enabling Success

Supporting Evidence

Public engagement

Reform is challenging: in managing the transition while existing delivery models and assets are ageing; in addressing public concerns of what changes may mean; and in supporting preventative behaviours, with an emphasis on individual agency and responsibility. This is a significant ambition with far reaching infrastructure impacts, requiring appropriate engagement.

Transition will not be easy, particularly where the timeline for infrastructure investment often creates the impression of lack of investment, rather than changed investment. The whole of the public sector and industry needs to support public engagement that helps drive the message of change, putting in place the systemic structures to support preventative behaviours, while continuing to listen to concerns and adapt where possible:

- **Meaningful and sustained engagement** should be viewed as a foundational component of successful long-term infrastructure planning and delivery.
- The development of a long term needs assessment provides an opportunity to **integrate public engagement into long-term infrastructure planning and decision making** to encourage shared ownership and resilience.
- Public understanding, acceptance, and community buy-in are **critical to delivery**, especially in areas influenced by planning reform and climate transition.
- Engagement should achieve transparency in investment decisions, including the significant investment in less visible maintenance and resilience priorities. It should emphasise the investment trade-offs necessary to achieve financial sustainability for the country.

> ⊙ KEY MESSAGE
>
> Public engagement should be integrated into long-term infrastructure decision-making and planning, while the public sector should support acceptance and understanding of public service reform ambitions through meaningful and sustained engagement with the public.

Enabling Success

Supporting Evidence

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Supporting Evidence

Supporting Evidence