Infrastructure
Commission
for Scotland

Phase 2: Delivery Findings Report
A blueprint for Scotland

Contents

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for Scotland

Phase 2 Delivery Findings Report

Foreword

We published our Phase 1 Report earlier this year, with inclusive economic growth and net zero carbon emissions, an inclusive net zero carbon economy, at the core of our 30-year vision for infrastructure in Scotland. Now at publication of our Phase 2 report only six months later, we find ourselves in a very different world. The Covid-19 pandemic has had a profound social and economic impact in the UK and across the world.

However, the pandemic has not stimulated or exposed fundamental issues with infrastructure assets themselves. The infrastructure of Scotland has, in the main, shown great resilience and adaptability despite the extreme fluctuations of demand, particularly in the transport sector.

Prioritisation and investment in our infrastructure that delivers an inclusive net zero carbon economy remains the key focus for the Commission. Our Phase 1 Report investigated the "why and what" of our future infrastructure needs and we have moved onto the "how" of infrastructure delivery for this Phase 2 Report. Infrastructure delivery is a very broad area to cover, and we have therefore chosen to focus on a number of specific aspects of that delivery landscape, which we believe will have the greatest impact. These areas are the adoption of a long term approach to prioritising an inclusive net zero carbon economy, how to optimise the impact of infrastructure in enabling sustainable places and delivering a thriving construction sector through an improved interface between the public sector and industry. We believe the implementation of our recommendations for these areas combined with those

established during our Phase 1 work is vital to deliver the future infrastructure needs of Scotland over the long-term.

Much of the evidence that informs this report pre-dates the Covid-19 pandemic. However, we have also been engaging widely in recent months, as the pandemic has developed. The Commission's work continues to be focused on a longer-term vision for Scotland's infrastructure, and is not aimed at the immediate recovery activity that is being addressed by others. We have nevertheless considered the evidence we have received in relation to the short term impacts of the Covid-19 pandemic and have reflected on the impacts that the pandemic may have on the infrastructure needs, usage and delivery in Scotland over the long term.

What has become clear during that process of reflection is that the pandemic has served to reinforce many of the drivers and conclusions we highlighted in our Phase 1 Report and to amplify the need for urgent action and change: the importance of an inclusive net zero carbon economy; the need for an integrated cross-infrastructure approach to prioritisation and

> Our Phase 1 Report investigated the "why and what" of Infrastructure and we have moved onto the "how" of infrastructure delivery for this Phase 2 Report.

> The Infrastructure sectors covered in the Phase 1 Report included: Energy, Digital, Transport, Housing, Natural Capital, Water & Wastewater, Flood Management, Waste Management, Education, Health, Emergency Services and Justice.

investment; the importance of continuous broadly-based engagement with all of the people who develop, construct, manage and use infrastructure, particularly through places where we live and work; the need to make better use of existing assets and resources; the need to engage and reflect in an informed way with the public; and the importance of strategic long term, independent advice.

As Commissioners, we would like to express our sincerest thanks and gratitude to the many hundreds of organisations and individuals who have taken the time to contribute to our work, and have actively engaged with us over the last 18 months to shape, inform and guide our findings.

Commissioners also thank the Secretariat for their intensive and extensive work during this period, working with us to draw the evidence together and produce our two reports.

To ensure that future infrastructure prioritisation, investment and delivery can fully contribute to the delivery of an inclusive net zero carbon economy for Scotland, it is now incumbent on all of us who plan, build, invest in, own, operate, regulate and use Scotland's infrastructure to embrace the challenges as well as to grasp the opportunities that lie ahead. The recommendations from the Commission's work over the last 18 months are designed to galvanise and accelerate action.

The Infrastructure Commission for Scotland

Ian Russell CBE (Chair), Professor Iain Docherty, Ken Gillespie, Benny Higgins, Mary Pitcaithly OBE, Rachel Skinner, Grahame Smith, Sara Thiam, John Trower, Professor Janette Webb

Executive Summary

The Infrastructure Commission for Scotland was established in early 2019 to provide independent advice to the Scottish Ministers on a 30-year vision (the "why and what") of infrastructure for Scotland, and to consider options for delivery (the "how"). The Phase 1 Report, published in January 2020, focused on the "why and what" of these challenges. This Phase 2 Report focuses on the "how".

The Infrastructure Commission for Scotland was established in early 2019 to provide independent advice to the Scottish Ministers on a 30-year vision (the "why and what") of infrastructure for Scotland, and to consider options for delivery (the "how"). *The Phase 1 Report*, published in January 2020, focused on the "why and what" of these challenges. This Phase 2 Report focuses on the "how".

The findings of the Phase 1 Report were framed around a long term vision for inclusive economic growth and net zero carbon emissions, an inclusive net zero carbon economy for Scotland, and it focused on identifying actions to ensure that the future prioritisation of investment in infrastructure aims to achieve those outcomes. Since publication, the Phase 1 Report key findings and recommendations, have resonated well and generated the support of many of those who plan, build, invest in, own, operate, regulate, and use the infrastructure of Scotland.

However, whilst ultimately it is for Ministers to decide how to implement those Phase 1 recommendations, the Commission has assumed for the purposes of the Phase 2 Report, that they will be implemented in full. In other words, the Phase 2 Report should not be read as a separate, standalone document, but as the next chapter in the story to plan, develop, deliver and subsequently operate Scotland's infrastructure over the next 30 years.

Since publication of our Phase 1 Report, we have also been confronted with the Covid-19 pandemic. The Commission has considered how it should address the impact of the pandemic as part of its Phase 2 work and has concluded that our work should not be aimed at addressing the immediate recovery from the pandemic; there are already many organisations in the public, private and third sector devoting considerable amounts of thought and energy to that.

Rather, we have been engaging with many stakeholders over the last few months and have taken into consideration the longer-term impact and implications of some of those more immediate lessons and experiences that have emerged because of the pandemic. Reflecting on those experiences has also reinforced many of the findings of our Phase 1 work and, if anything, has emphasised the need to ensure they are implemented.

In focusing on the "how" of infrastructure during Phase 2, the Commission has sought to address some of the key elements of the infrastructure lifecycle as illustrated in the diagram on the next page. This is described in more detail in the Introduction (pages 14-22).

The Commission recognised early in this second phase of activity that it would not be possible to address the delivery aspects of each stage of the infrastructure lifecycle across all the dimensions identified in the time available. Commissioners were also keen that the Phase 2 work was able to build on the Phase 1 findings to identify and address the challenges to the implementation of those findings.

In order to achieve that objective, three particular areas were identified for further detailed investigation during Phase 2, namely:

> **Prioritising an inclusive net zero carbon economy** and a long-term approach to infrastructure strategy,

> How best to optimise the impact of infrastructure in **enabling sustainable places**; and

> **Delivering a thriving construction sector** through enhancing the interaction between the public sector and industry

In combination these areas are essential to ensuring that the vision established during our Phase 1 work can be effectively implemented over the long term to meet the future infrastructure needs of Scotland, and also help to inform considerations around the creation of a **Scottish National Infrastructure Company**, as set out in the remit for the Commission.
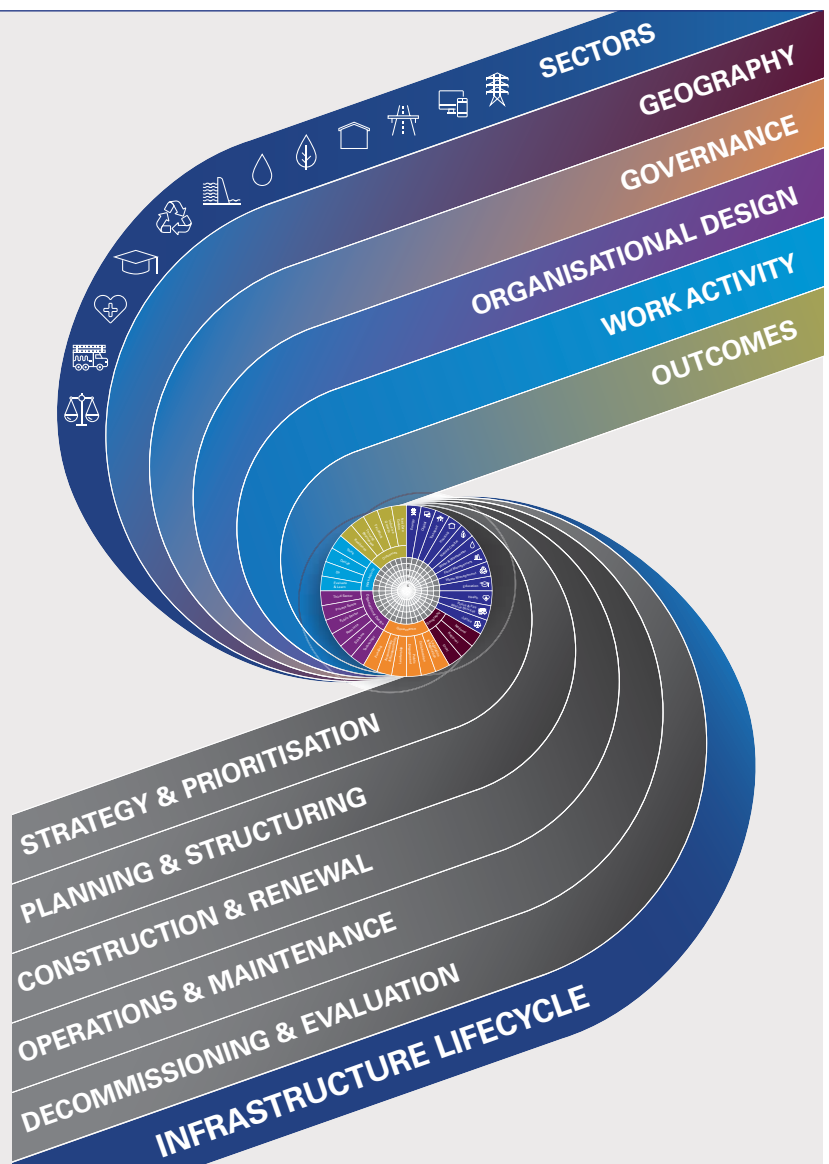
We have set out below a series of recommendations across the areas highlighted above that we believe, in conjunction with the recommendations from Phase 1, can set the infrastructure foundations for an inclusive net zero carbon economy for Scotland.

Infrastructure delivery lifecycle

For the purposes of the Commission's work in looking at Infrastructure delivery, we have identified five stages of the infrastructure delivery lifecycle that move from first prioritising the right infrastructure, through second planning and structuring, third construction and renewal, then fourth maintaining and operating that infrastructure, and fifth and finally to decommissioning and completing evaluation. The latter is intended to ensure continuous monitoring and review in order to establish whether, over its life, the infrastructure contributed to the outcomes originally anticipated.

Looking at infrastructure from that lifecycle perspective is a useful basis for reviewing any issue or situation. In looking across that lifecycle, there are also a number of ways in which that can be further investigated, and in order to provide a framework for the Commission's work, we have represented this as six areas of interest or dimensions, namely: sectors, geography, governance, organisational design, work activity and outcomes.

SECTORS
GEOGRAPHY
GOVERNANCE
ORGANISATIONAL DESIGN
WORK ACTIVITY
OUTCOMES

STRATEGY & PRIORITISATION
PLANNING & STRUCTURING
CONSTRUCTION & RENEWAL
OPERATIONS & MAINTENANCE
DECOMMISSIONING & EVALUATION
INFRASTRUCTURE LIFECYCLE

Summary of Recommendations

↓01

Prioritising an Inclusive Net Zero Carbon Economy

Recommendation

Prioritising inclusive economic growth and net zero carbon emissions were the key messages from the Commission's Phase 1 Report. To achieve an inclusive net zero carbon economy, the Commission made recommendations for a fundamental change to the infrastructure appraisal methodology and framework, as well as the development of an integrated infrastructure needs assessment, supported by the establishment of independent long-term advice.

The Covid-19 pandemic has only served to re-enforce the importance of implementing these recommendations. To build on those Phase 1 recommendations, the Commission has further developed its thinking on **how** they should be implemented during Phase 2.

The Commission has concluded that, to achieve the Phase 1 recommendations, the independent long-term advice organisation will need to sit outside the political decision making system. This will enable it to operate in an arms-length and transparent way which builds confidence for public and private sectors as well as civic society and the public.

Ultimately, investment decision making is the responsibility of the Government, and the Commission recognises that the Scottish Government is central to developing the detailed plans to enable a long-term infrastructure vision to be delivered and maintained. However, we have identified the need for Scottish Government, government agencies and local authorities, to undertake infrastructure planning, prioritisation and investment decision making on a system wide, cross government, portfolio and sector basis; focused principally on an outcome-based approach. This would enable the independent long-term advice and the Scottish Government's decision-making approach to complement and mirror each other, supporting and enhancing effective decision making focused on an inclusive net zero carbon economy.

Independent long-term advice

1. By 2021, to enable prioritisation of an inclusive net zero carbon economy in infrastructure planning over a 30-year period, an independent, specialist body should be given the following responsibilities by the Scottish Government:

   > Develop a 30-year infrastructure needs assessment and strategy, refreshed every 5-years for all public and private infrastructure;

   > Undertake regular strategic public engagement to inform the long term strategy;

   > Provide strategic challenge to the Government of the day; and

   > Undertake one-off strategic reviews and research.

Prioritisation and decision making

2. To support infrastructure decision making that will prioritise an inclusive net zero carbon economy, the Scottish Government should:

   > Ensure, and where possible accelerate, implementation of our Phase 1 Report recommendations 2 (Assessment Framework and Methodology), 3 (Needs Assessment), 4 (Infrastructure Investment Plan) and 5 (Place Based Housing and Industry Assessment); and

   > By the end of 2021, introduce an outcome-led, integrated cross-infrastructure prioritisation approach that incorporates and balances spatial and sector needs; the output would inform affordability assessment and budget allocation of infrastructure funding.

↓02

Enabling Sustainable Places

Recommendation

Places are at the intersection between the ambition of an inclusive net zero carbon economy and the right infrastructure. Understanding and responding to the needs of places is therefore central to achieving the Commission's vision as seen in Phase 1.

The language and objectives of place continue to be widely accepted and the Place Principle provides an effective model to design places well. However, the good practice approaches are often in pockets and too dependent on good-will; therefore alongside methodologies such as the Place Standard tool, there is a need to more firmly embed these principles in practice.

Each place is unique and dynamic, with a range of legacy infrastructures and stakeholders, whether public, private, third sector or communities. Collaboration is therefore essential, yet there are often barriers to this collaboration, undermining the delivery of better places. Obstacles to collaboration include issues such as the challenges of upfront investment by developers and utility companies; insufficient alignment of objectives within the public sector, undermining a more cohesive "one public sector" approach; and creating barriers to the necessary culture of trust and reciprocity across all parts of the industry, whether public, private or community.

There are, however, opportunities to overcome system issues, including National Planning Framework 4 ("NPF4") and the process to develop the framework. Other themes include the need for a robust evidence base, supported by the use and standardisation of digital data, to understand, develop and re-develop our places more efficiently. Finally, there are a broad range of skills that can be drawn upon to build better places; however, where there are gaps these need to be addressed. Reflecting these key findings, our recommendations cover the three inter-linked areas of Systems & Behaviours, Enabling Digital Technology, and Resources.

Systems & Behaviours

3. Scottish Government should enshrine the use of the Place Principle within planning practice, by end of 2021, through guidance, legislation or regulation as appropriate.

4. Building on Phase 1 needs-based recommendations, in the development of National Planning Framework 4, Scottish Government should establish a cross-portfolio, and robust evidence-based, land use appraisal and prioritisation approach by end of 2021, which vertically aligns national, regional and local needs. This involves co-produced industrial, settlement (including housing) and labour & skill strategies for each spatial level, which manage the difficult trade-offs and maximise the potential of an inclusive net zero carbon Scotland. This systematic appraisal and prioritisation approach should:

   > Consider the fullest interpretation of an inclusive net zero carbon economy, including economic growth which reflects fair work, access to the labour market and equity, including spatial equity[i].

   > Support a working agreement on land use priorities, including vacant and derelict land sites; and

   > Facilitate market certainty to unlock significant sites, with coordination and clarity of the funding, financing and delivery of enabling infrastructure; including,

   > A cohesive approach to planning obligations, to overcome issues of first-mover risk, transparency around enabling infrastructure and other disincentives to investment.

5. A "one public sector" outcome-based approach should be developed for our places by the end of 2021. This would build on changes within the Planning Scotland Act (2019), establishing a clear duty to co-produce and co-deliver existing and proposed spatial plans and includes the necessary shared accountability measures. How this effectively complements and learns from Community Planning Partnerships, Local Area Improvement Plans, Locality Plans and Local Place Plans should be reviewed, to make as efficient and streamlined as possible, while ensuring collaboration becomes a required practice.

6. Scottish Government should co-ordinate national upfront utility investment via changes to guidance, legislation or regulation by end of 2021.

Enabling Digital Technology

7. Recognising the critical and increasing importance of high-quality data to infrastructure assets of all types, Scottish Government should establish a digital data co-ordination, standards and facilitation role, by the end of 2021, to support the efficient and innovative development and use of data for the infrastructure sector.

    > This should include a review of existing data development and management roles, to ensure the competency is located and resourced in the most efficient way.

    > The function should support and drive the development of activities such as digital twins, where the sharing of asset data information facilitates better use of existing assets and informs future investments; and

    > identify skill and training requirements and, with partners, establish an effective strategic response.

8. A centrally held data resource is developed by the end of 2021, to provide open-source data that will inform place need and demand, including effective asset development, refurbishment and use, for an inclusive net zero carbon economy.

Resources

9. Scottish Government, in partnership with the private sector, third sector and communities, by the end of 2021, should further develop and harness the essential skills to develop and improve our places. This should include establishing and directly supporting an appropriately experienced and co-ordinated skill resource for the prioritisation, planning and delivery of infrastructure, which is available to all local authority stakeholders, across spatial levels.

↓03

Delivering a Thriving Construction Sector

Our Phase 1 Report made a number of recommendations relating to Scotland's infrastructure requirements over the next 30 years in order to deliver an inclusive net zero carbon economy. To achieve this, significant investment in our infrastructure will be required and major programmes of work developed. If this is to be delivered successfully, we need to ensure we have an effective, modern and fair interface in place that works for the mutual benefit of both client and contractor.

There is, of course, work already underway to drive positive outcomes that aims to increase productivity, raise capability, improve resilience, restore public and political confidence in public sector construction procurement and increase the reputation of the construction sector. This includes, for example, wider implementation of framework contracts, ensuring less focus on lowest cost bids by eliminating unsustainable pricing, developing and implementing more collaborative approaches between client and contractor and encouraging the use of local workforces, subcontractors and suppliers. While this provides a strong foundation to build on, we have concluded that further work is required and there is a window of opportunity for the public and construction sectors to reset and strengthen their future relationship in order to prepare for the delivery challenges we face over the next 30 years to ensure that Scotland's infrastructure supports an inclusive net zero carbon economy.

Recommendation

10. By building on its work to date, the Scottish Government and Construction Scotland Leadership Group should, by Quarter 1 2021, jointly lead, develop, resource and implement a "Construction Accord" between all Scottish public bodies and the whole of the construction sector. Its purpose is to set out an inclusive, shared vision for, and commitment to create, the market interface conditions to support a high performing construction sector for the benefit of all Scotland, that contributes to the achievement of an inclusive net-zero carbon economy and underpins the delivery of the National Infrastructure Mission.

11. This should include measures:

> to improve the capacity, capability and diversity of the workforce (at all levels) for both client & contractor, including the development of skills relevant to modern methods of construction and the application of new technologies;

> to develop a more coherent and less fragmented approach to skills development and training in Scotland which is more sharply focussed on the needs of the construction sector – both in the immediate and longer terms;

> to monitor numbers and competency within the industry, consideration should be given to the development of an appropriate registration scheme for all apprenticeships in Scotland which will also raise the profile of construction careers as well as helping to promote and support the delivery of quality in the sector;

> to ensure those working in the construction sector are employed under the principles and conditions of Fair Work in order that they enjoy safe, secure and rewarding careers;

> to enable the development of improved programme pipeline forecasting and management that demonstrate longevity and a reasonable degree of certainty and that allow the experience gained on previous projects to be utilised to enhance the delivery of subsequent projects;

> that will enable a move away from transactional, cost driven procurement of individual assets, through the development and introduction of value driven, collaborative procurement methods (appropriate for Scottish needs) that can deliver investment programmes designed to secure national outcomes.

↓04

Scottish National Infrastructure Company

The Commission's overarching approach has been to ensure its conclusions and recommendations have been developed in response to the emerging problems and issues it has identified or evidence it has received. In addition, its recommendations are based on an aspiration that the delivery of Scotland's infrastructure is achieved through a coordinated, whole system approach designed to ensure that the public and construction sectors work together in a strong collaborative partnership that contributes to an inclusive net zero carbon economy.

After careful consideration, the Commission has concluded from its work that none of the outcomes of its recommendations would be enhanced by creation of a Scottish National Infrastructure Company. However, it also recognises that going forward, the situations and the problems we need to respond to are not constant and can change very quickly – the Covid-19 pandemic and its implications for society and the economy serve to illustrate that point. Any future consideration of a Scottish National Infrastructure Company will need to draw on the evidence of how successfully the Commission's recommendations have been implemented, and their impact, as well as the context prevailing at the time.
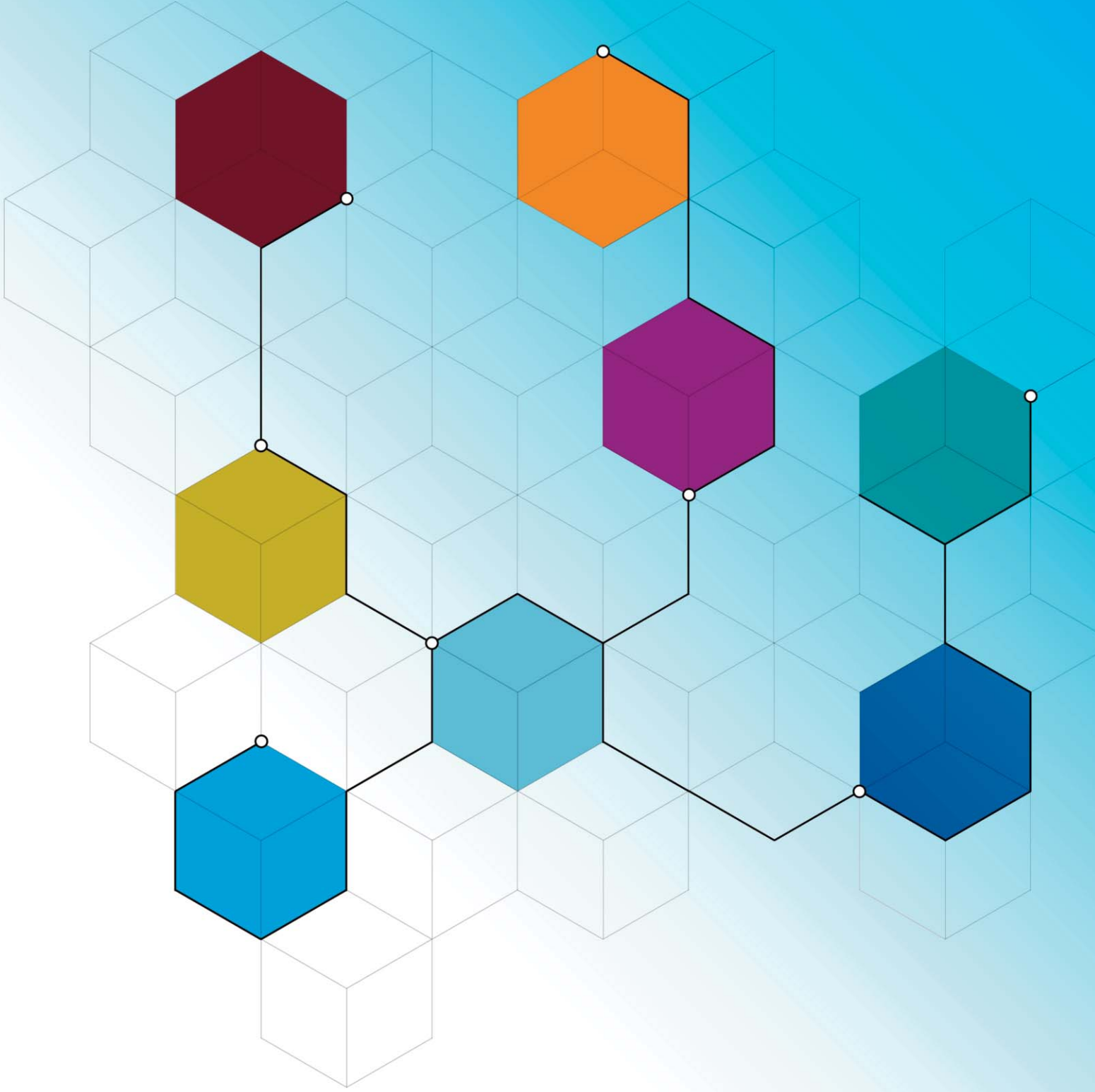
Next Steps

With the publication of this Phase 2 Report and submission of further advice to Scottish Ministers, the Infrastructure Commission for Scotland has concluded its work, and we thank the many hundreds of organisations and individuals who have engaged with us, to help inform and guide our work.

We are clear in our view that infrastructure has and will continue to have a crucial role if we are to realise the significant social, economic and environmental benefits of an inclusive net zero carbon economy.

We are also clear that the implementation of all of the recommendations made in both our Phase 1 and Phase 2 Reports - some of which we acknowledge will necessitate a fundamentally different way to prioritise, plan and deliver infrastructure investment - will make a significant contribution to the successful delivery of that inclusive net zero carbon economy. We call on Scottish Minsters to act on and engage widely to address these challenges and opportunities.

Introduction

PHASE 2: DELIVERY FINDINGS REPORT

Introduction

The Infrastructure Commission for Scotland was established in early 2019 to provide independent advice to the Scottish Ministers on a 30-year vision (the "why and what") of infrastructure for Scotland, and to consider options for its delivery (the "how"). The Phase 1 Report[ii], published in January 2020, focused on the "why and what" of these challenges. This Phase 2 Report focuses on the "how".

The Infrastructure Commission for Scotland was established in early 2019 to provide independent advice to the Scottish Ministers on a 30-year vision (the "why and what") of infrastructure for Scotland, and to consider options for its delivery (the "how"). The Phase 1 Report , published in January 2020, focused on the "why and what" of these challenges. This Phase 2 Report focuses on the "how".

The findings of the Phase 1 Report were framed around inclusive economic growth and net zero carbon emissions, a long-term vision for an inclusive net zero carbon economy for Scotland. It made 23 recommendations, summarised in Appendix A, setting out the strategic actions which the Commission considers will need to be implemented if the Government's vision is to become a reality. These focused on identifying actions to ensure that the future prioritisation of investment in infrastructure is aimed at achieving those outcomes. Since publication, the Phase 1 Report key findings and recommendations have resonated well and generated the support of many of those who plan, build, invest in, own, operate, regulate and use the infrastructure of Scotland.

However, whilst ultimately it is for Ministers to decide how to implement those Phase 1 recommendations, the Commission has assumed for the purposes of the Phase 2 Report, that they will be implemented in full. In other words, the Phase 2 Report should not be read as a separate, standalone document, but as the next chapter in the story to plan, develop, deliver and subsequently operate Scotland's infrastructure over the next 30 years.

Both Reports place the achievement of an inclusive net zero carbon economy for Scotland at their core. Consequently, the conclusions and recommendations in the Phase 2 Report are both complementary to and an integral part of the recommendations in Phase 1 and must be read and acted upon together if their intended effect is to be achieved.

As already noted, since publication of the Phase 1 Report, we have been confronted with the Covid-19 pandemic and the consequent social and economic impact and disruption.

The Commission has considered how it should address these impacts as part of its Phase 2 work and has concluded that its work should not be aimed at addressing the immediate recovery from the pandemic; there are already many organisations in the public and private sector devoting considerable amounts of thought and energy to that.

However, we have also been engaging with many stakeholders (Appendix B: Stakeholder Engagement Strategy, Appendix C: List of Stakeholders) over the last few months and have taken into consideration the longer-term impact and implications of some of those more immediate lessons and experiences that have emerged because of the pandemic. Reflecting on those experiences has also reinforced many of the findings of our Phase 1 work and, if anything, has emphasised the need to ensure they are implemented. Some specific examples of this are provided on the following page.

> *"The urgency and pace of change will need to increase, and the scale of change required will affect almost every aspect of daily lives. It is also becoming clear that the vision of both an inclusive growth and net zero carbon economy will require sometimes difficult choices to be made and trade-offs to be addressed…"*

Phase 1 Report and Covid-19

> The significant increase in home working for millions of people has had a number of impacts. Whilst the massive decrease in travel by road, rail and bus has reduced transport carbon emissions there has been a corresponding increase in domestic heating and energy consumption. How long both of those trends persist is not clear, but, as identified in recommendation 13 of our Phase 1 report, future consideration of decarbonisation across both heat and transport should be completed in a combined way through a heat and transport route map. The need to change how we assess transport specifically was also identified in recommendations 14, 15 and 16 of our Phase 1 Report.

> The need to invest in infrastructure as part of any Covid-19 economic recovery has been clearly highlighted. Many commentators are also stating that there is a significant opportunity for an accelerated "green recovery" approach. To enable the real economic benefits to be seen as quickly as possible this could be focused on a comprehensive refurbishment of existing assets, to maximise energy and cost savings as well as investment in new assets to ensure that they are net zero ready (recommendations 8, 9 10 and 12 of our Phase 1 Report).

> The places where we work and live, and where the services we use, and need, are located, have been drawn into sharp focus by Covid-19. To plan and deliver our future place needs across Scotland, Phase 1 highlighted the clear requirement for a place to be at the heart of any infrastructure planning and needs assessment (recommendations 3 and 6), supported and informed by a coherent and joined up housing needs and industrial strategies (recommendation 5) as well as a coherent and complementary public sector asset management strategy (recommendation 7).

> The need for fit for purpose digital infrastructure was identified in recommendations 17, 19, 20 and 21 of our Phase 1 Report. The Covid-19 pandemic has amplified the need for this to be implemented and accelerated to ensure greater resilience and capacity for digital connectivity for businesses, schools and health services; as well as enabling communities and families to stay connected.

Introduction (continued)

The infrastructure delivery landscape

In seeking to establish a clear scope of work for Phase 2, the Commission has heard concern from stakeholders that the current infrastructure delivery landscape is extremely complex and crowded, and there is a need for better coordination of decision-making and delivery across all aspects of that landscape. We have sought to bring some clarity to that complexity with a graphical model of that landscape, and to develop some common language to help our understanding of what is involved.

Infrastructure assets in the main are not developed and delivered quickly, however their useful life often extends many decades and in some cases centuries after completion; particularly when used efficiently and maintained effectively. Given this long-term asset use, the concept of an infrastructure lifecycle is a relatively well-known basis from which to begin to address some of the complexity of the infrastructure landscape, although there are variations in how this is described and presented. For the purposes of the Commission's work, we have identified five stages of the infrastructure lifecycle that move from first prioritising the right infrastructure, through second planning and structuring, third construction and renewal, then fourth maintaining and operating that infrastructure, and fifth and finally to decommissioning and completing evaluation of the infrastructure. The latter is intended to ensure continuous monitoring and review in order to establish whether, over its life, the infrastructure contributed to the outcomes originally anticipated. These definitions are expanded upon in page 18.

Looking at infrastructure from that lifecycle perspective is a useful basis for reviewing any issue or situation. In looking across that lifecycle, there are also a number of ways in which that can be further investigated, and in order to provide a framework for the Commission's work, we have represented as six further areas of interest or dimensions namely, sectors, geography, governance, organisational design, work activity and outcomes. These definitions are expanded upon in page 18.

To bring that approach to life we have developed an Infrastructure Lifecycle Model that reflects these five stages and six dimensions in a diagrammatic form, as shown in its basic form on page 19. This Model is then adapted in each of the following sections of the report to demonstrate the aspects of the Infrastructure Lifecycle being assessed.

Infrastructure delivery lifecycle

Introduction (continued)
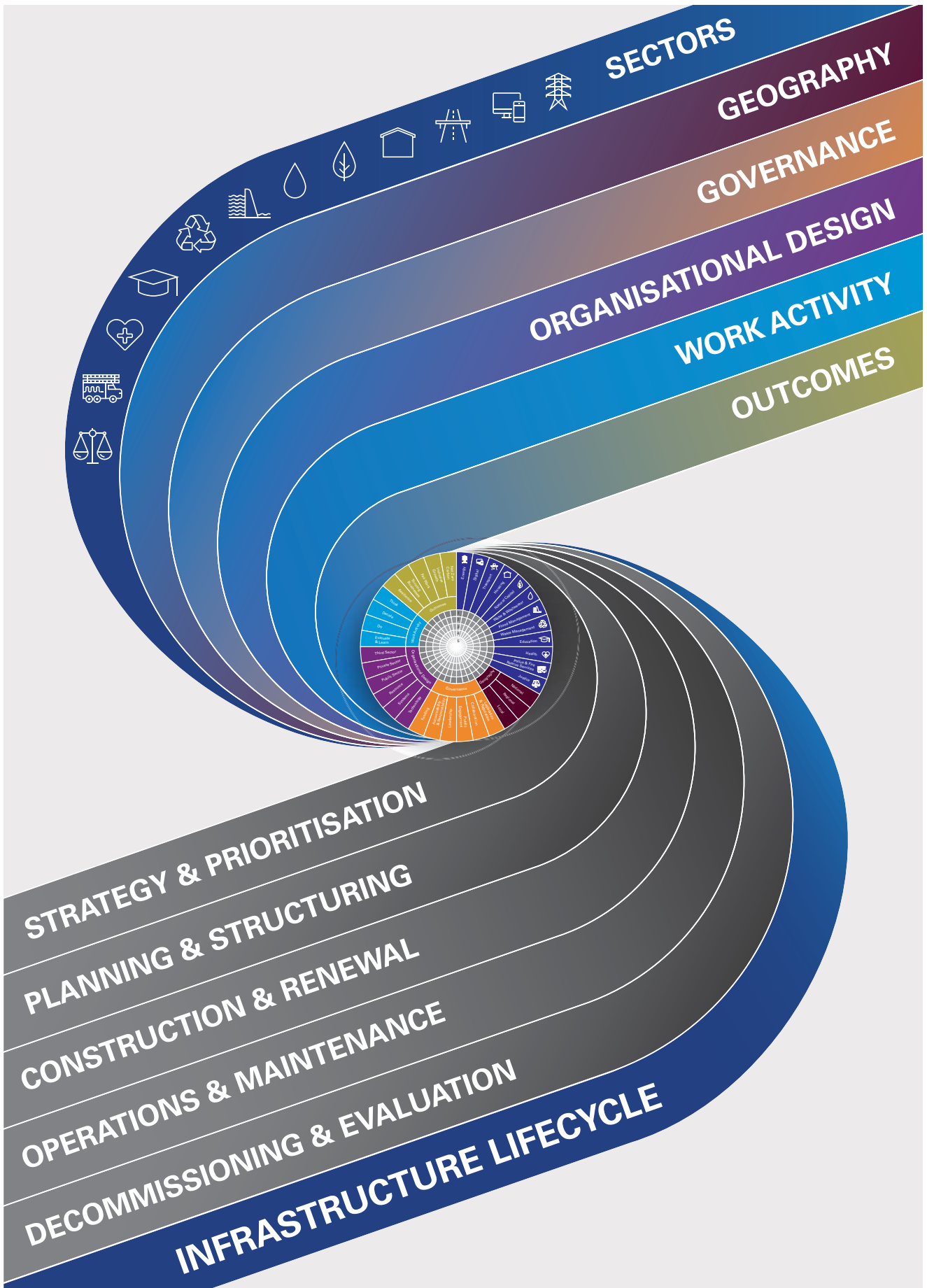
Lifecycle

01	**Strategy and Prioritisation** The overall long-term strategy and prioritisation for infrastructure across Scotland to achieve the desired outcomes.
02	**Structuring and Planning** Sectoral and spatial policies and planning, regulation, financing and coordination to pursue the strategy.
03	**Delivery and Renewal** The development of programmes and projects, briefing, procurement, design, delivery and oversight of new or significantly refurbished infrastructure.
04	**Operation and Maintenance** The effective operation and maintenance of infrastructure to meet current and evolving needs including eventual re-purposing or disposal.
05	**Decommissioning and Evaluation** The effective cessation of active asset use and its safe decommissioning as well as completing the evaluation of the asset's performance against outcomes whether it is being decommissioned or repurposed.

Dimensions

■ *Sectors:*

The Commission is looking across the broad spectrum of sectors to include transport, digital, energy, water & wastewater, housing, flood defence, education, health, waste management, justice, police, fire and rescue services and natural assets.

■ *Geography:*

Place has been identified as a key consideration and there are a range of spatial elements to consider, be that at a national, regional or local level, as well as how those spatial aspects interact between them.

■ *Governance:*

How the various stages are governed in its broadest sense, is vitally important and that has a number of components to it including the more formal aspects of legislation and regulation, as well as accountability and responsibility. Approaches to collaboration and public engagement are evidently becoming more important as is the leadership that is shown across all of the stages of the lifecycle. How infrastructure is funded and financed is also a significant consideration.

■ *Organisational design:*

This is again a broad area and includes organisational "ownership" be that public, private or third sector. Across all of those sectors the key issues of resource capacity and capability, system design and implementation and the enabling digital technology available to enhance and support activity are critical to successful infrastructure provision across the stages of the lifecycle.

■ *Work activity:*

A simple concept, and at its heart is the fact that at any stage of the lifecycle there will be a process of thinking about issues and solutions and deciding what are the actions required to address those. There is then a requirement to complete the actions and then an important step to evaluate and learn once that process has been completed.

■ *Outcomes:*

All of the above are framed around the need to establish, from the outset, a set of outcomes that are being sought throughout the stages of the infrastructure lifecycle, and against which "success" will be measured. There are clearly a significant range of potential outcomes, and through the work of the Commission those of net zero carbon, inclusive economic growth, fair work, thriving businesses and resilience have been identified as particularly important.

Infrastructure lifecycle model

We have developed a model that seeks to capture the five lifecycle stages as well as the six dimensions, and the sub elements for each of those dimensions, as presented below. The aim of the model is to provide a graphical representation, for any given scenario of analysis, the specific elements of the model that are relevant and to provide a simple illustration of what is and is not being considered in that given scenario.

To highlight the relevant lifecycle stage that is being considered, the relevant section of concentric circle in the middle is shaded.

To highlight the dimension that is being considered there are three levels of "explosion" for each individual sub-element for each dimension, where level 0 is "less important", level 1 is "important and being considered" and level 2 is "key area of consideration". A model for each of the areas of focus of the Phase 2 work is shown in the relevant sections of this report.

An interactive version of the model has been developed and can be found on the *Infrastructure Commission for Scotland* website. This will enable any user to develop a graphical model for any scenario that they wish to consider, that could be useful when working with wider stakeholders to identify what aspects of the various lifecycle stages and dimensions are being considered for that issue or project.
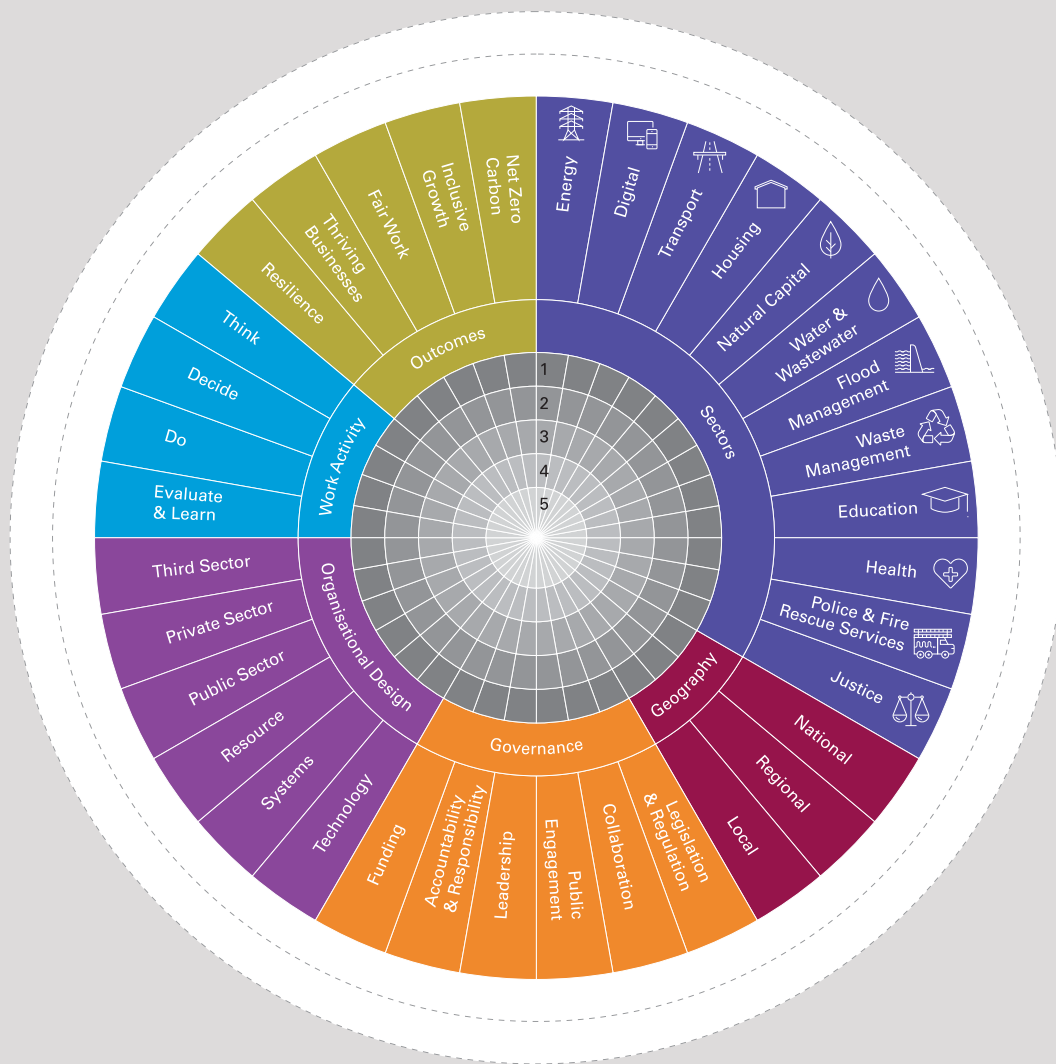
Dimensions

- Sectors
- Geography
- Governance
- Organisational Design
- Work Activity
- Outcomes

Lifecycle Stages 1-5

1. Stage 1 - Strategy & Prioritisation
2. Stage 2 - Planning & Structure
3. Stage 3 - Construction & Renewal
4. Stage 4 - Operational & Maintenance
5. Stage 5 - Decommissioning & Evaluation

Dimension Priority

- Level 3 - Very Important
- Level 2 - Important
- Level 1 - Less Important

Introduction (continued)

**Areas of focus
for Phase 2**

↓01

Prioritising an inclusive net zero carbon economy

The Commission recognised early in this second phase of activity that it would not be possible to address the delivery aspects of each stage of the infrastructure lifecycle across all the dimensions identified in the time available. Commissioners were also keen that the Phase 2 work was able to build on the Phase 1 findings to identify and address the challenges to the implementation of those findings.

In order to achieve that objective, three particular areas have been identified for further detailed investigation, namely:

1. **Prioritising an inclusive net zero carbon economy** and a long-term approach to infrastructure strategy,

2. How best to optimise the impact of infrastructure in **enabling sustainable places**; and

3. **Delivering a thriving construction sector** through enhancing the interaction between the public sector and industry.

In combination, these areas are essential to ensuring that the vision established during our Phase 1 work can be effectively implemented over the long term to meet the future infrastructure needs of Scotland (the "how"), and also help to inform considerations for the creation of a **Scottish National Infrastructure Company**, as set out in the remit (appendix D) for the Commission.

Many of the recommendations within the Phase 1 Report will, building on existing frameworks and tools, result in a range of methodologies and approaches to support more integrated system wide infrastructure prioritisation decision making; all aimed at achieving an inclusive net zero carbon economy. It is anticipated that implementation of the recommendations by the Scottish and UK Governments, the wider public sector and the private sector, will provide an analytical framework and a strategy which supports decision making, informs budgetary decision making, both supported by the development of independent long-term advice highlighted within our Phase 1 recommendation 23.

In order to inform the implementation of the Phase 1 recommendations, the Commission has undertaken work to further develop the Phase 1 recommendation to establish the provision of independent long-term advice as well as considering any additional changes that may be required to successfully implement the prioritisation recommendations from Phase 1 and how those could interface with the establishment of the independent long-term advice. A detailed examination of the issues and our conclusions and recommendations are contained in Section 1 of this report.

↓02

Enabling Sustainable Places

Throughout our Phase 1 engagement, stakeholders were universal in their desire to see good-practice place concepts used consistently when planning infrastructure, whether for developing new or existing places. There is, however, a recognition that we have not always got it right. Yet with the evolution of a place policy framework which includes guidance such as the Place Principle and tools such as the Place Standard, there is now a greater opportunity to achieve a consistent approach. There are however often barriers to enabling sustainable places. In addition, there are areas of opportunity we should be developing, such as the use of emerging digital technology, perhaps even more relevant in a post-Covid-19 world; or using existing assets and resources more effectively, a key theme in Phase 1.

Our engagement both in Phase 1 and 2 has emphasised that maximising the benefits of place is also about understanding which actions and interventions work best at national, regional and local/settlement levels; and how the different parts connect. Now more than ever, through our collective experience of Covid-19, we have seen an elevation in the role of our communities and have begun to consider the most effective role of our economic centres. While Place has been at the heart of policy developments to ensure infrastructure and related services meet communities' needs, we have a refreshed focus to ensure we provide a geography-specific approach aligned around inclusive economic growth and net zero carbon priorities. As noted in our Phase 1 report, this includes natural capital, which is integral to sustainable, liveable and healthy places.

Building on this evidence and the strong policy framework, further targeted engagement was undertaken over May and June 2020, allowing for greater clarity on the areas that need to be better aligned, in order to ensure developing sustainable places is central to our decision-making. Appendix C highlights the organisations we engaged with. A detailed examination of the issues and our conclusions and recommendations are contained in Section 2 of this report.

↓03

Delivering a Thriving Construction Sector

In its Phase 1 Report, the Commission set out its recommendations for an infrastructure strategy designed to support a sustainable, resilient and inclusive Scotland over the next 30 years. A major theme of the Phase 1 Report was the need to ensure the adoption of a whole system approach to infrastructure investment decisions. This recognised that the infrastructure we choose to invest in must contribute to wider outcomes that will benefit Scotland as a whole and not just a series of narrow or specific project outcomes; the Phase 1 recommendation that all infrastructure investment decisions should be based on their contribution to the delivery of an inclusive net zero carbon economy serves to illustrate the point.

However, this concept of a whole system approach is not limited to only the decision-making or planning aspects of our infrastructure requirements. It also relates to the "hard" delivery of projects, which can also be considered as the "market interface" between client and contractor, with outcomes dependent on a combination of many interrelated factors. These include, for example, the respective skills, capacity and competence of both client and contractor – are they right for the particular project; their relationship – is it collaborative or adversarial; and the procurement process chosen – is it appropriate for the particular project and is it being managed correctly. Getting these and other related issues, such as sustainable pricing, right will have a major impact on the successful delivery of a project. How the public sector engages with construction industry to secure the physical or "hard" delivery on the ground of new, refurbished or repurposed assets is the focus of this section, and a detailed examination of the issues and our conclusions and recommendations are contained in Section 3 of this report.

Introduction (continued)

↓04

Scottish National Infrastructure Company

Over the past few years, there has been a growing debate around the merits or otherwise of the private finance model for the funding of public infrastructure projects. There have been calls from organisations such as Common Weal, the STUC and a number of academics[iii] for a publicly owned construction company. The concept appears to be that such a company (commonly referred to as a SNIC) working in alongside the Scottish National Investment Bank (SNIB) would construct sustainably financed, locally procured infrastructure that would remain in public hands. Therefore, the Commission has taken this definition of a SNIC and its role and purpose as its starting point in addressing its remit.

From the outset of its Phase 2 work, the Commission has committed to undertake that assessment. However, in doing so it has not investigated any roles or activities on the basis that the creation of a SNIC is a pre-requisite. Instead it has adopted an evidence-based, whole system approach, aligned to the three areas of the infrastructure lifecycle that it has focused on during Phase 2, to determine if any of those areas would benefit from the creation of a SNIC. Throughout its work, the Commission has been consistent in its approach to meeting its remit by endeavouring to find the best and most effective solutions to the problems and issues it has identified, rather than starting with a pre-determined solution. A detailed examination of the issues and our conclusions and recommendations are contained in Section 4 of this report.

Stakeholder Engagement

During Phase 1 of our work we developed an engagement strategy and undertook extensive engagement with a broad range of stakeholders and the public that included:

> An Initial Call for Evidence (Appendix E: Initial Call for Evidence and Contributions; Appendix F: Initial Call for Evidence Submissions) that provided evidence from individuals, representative bodies, public bodies and organisations who use, plan, manage, maintain, finance and deliver infrastructure. We received over 140 responses.

> A series of five Regional Forums in Aberdeen, Edinburgh, Glasgow, Inverness and Moffat. The forums were designed to capture regional distinctions, through dialogue with representatives from the public, private and third sectors.

> The analysis of the Call for Evidence and the responses from the Regional Forums were used to identify key sectors, emerging themes and gaps in evidence which the Commission investigated in more depth via nine Thematic Round Tables attended by subject matter experts.

> A number of one-to-one and group meetings with representatives of specific sector interests.

> Finally, a programme of social research was undertaken by Ipsos Mori, to understand the views and opinions of the wider public, as both users of Scotland's infrastructure and often also contributors to its funding.

Whilst primarily aimed at the work undertaken during our Phase 1 activity, the evidence gathered also covered a number of the areas that have been addressed during our Phase 2 work, and we have drawn on that evidence where relevant, as well as desktop research completed during Phase 1.

We have also undertaken specific engagement during our Phase 2 work, although because of the Covid-19 pandemic, that engagement has been slightly reduced and different in nature than we had originally planned. Nevertheless, we completed over 40 "virtual" stakeholder engagement sessions during April, May and June 2020. These covered the breadth of the areas in our Phase 2 scope, involving a cross section of 60 representative bodies, public bodies, academia and organisations who use, plan, manage, maintain, finance and deliver infrastructure in Scotland. Beyond Scotland, engagement has also included sessions with organisations in the rest of the UK as well as New Zealand, Australia, Finland and the OECD. This evidence gathering has been augmented by desktop research to support all areas of our Phase 2 scope.
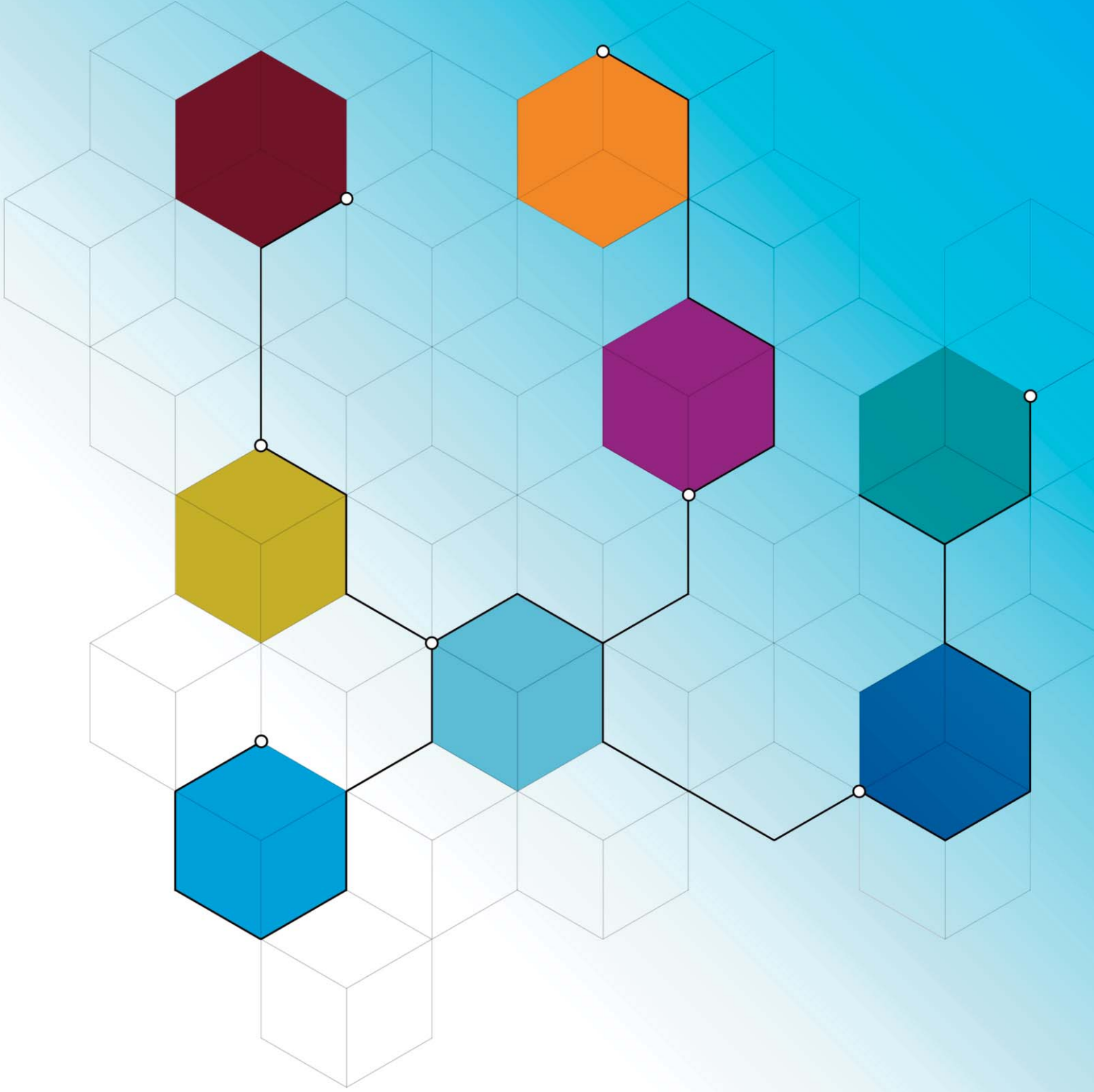
Section 1:
Prioritising an inclusive net zero carbon economy

PHASE 2: DELIVERY FINDINGS REPORT

Section **One**

Prioritising an inclusive net zero carbon economy

Introduction

Building on existing frameworks, the Commission's Phase 1 Report[iv] recommendations will support more integrated system wide infrastructure prioritisation, with decision making designed to achieve an inclusive net zero carbon economy. It is anticipated that implementation of the recommendations across the Scottish and UK Government, the wider public sector and the private sector will provide analytical and strategic capacities to inform government budgetary decision making. We concluded that this would be supported by the development of independent long-term advice highlighted in the Phase 1 recommendation 23.

During Phase 2, to inform the implementation of its Phase 1 recommendation the Commission has undertaken work to evaluate options for independent long-term advice provision. The Commission has also considered any additional Scottish Government changes that may be required to successfully implement the prioritisation recommendations from Phase 1 (recommendations 2 (Assessment Framework and Methodology), 3 (Needs Assessment), 4 (Infrastructure Investment Plan) and 5 (Place Based Housing and Industry Assessment), as well as enhancing the interface between Scottish Government and the independent long-term advice activity.

Both recommendation 23 and the additional Scottish Government actions for prioritisation should be supported by the implementation of recommendation 22, the need for comprehensive public engagement, from our Phase 1 Report. This should ensure that open dialogue and public opinion informs the work of both the long term independent advice body as well as Scottish Government activity.

Phase 1 Report: Outcome Based Approach Recommendations

Recommendation 2.

The Scottish Government should, by 2021, develop and publish a new infrastructure assessment framework and methodology that will enable system wide infrastructure investment decisions to be prioritised on the basis of their contribution to inclusive net zero carbon economy outcomes.

Recommendation 3.

The Scottish Government should publish by 2023 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.

Recommendation 4.

A fully updated Infrastructure Investment Plan should be developed by the Scottish Government for publication by 2025 using the new assessment framework and methodology and informed by the Infrastructure Needs Assessment.

Recommendation 5.

The Scottish Government should lead the development of a place based assessment of long term housing supply and demand across Scotland by 2021, supported by the development of a coherent strategy for the labour market and business opportunities arising from an inclusive net zero carbon economy.

Recommendation 22.

By 2022, the capacity and capability requirements for an informed approach to public engagement and participation need to be clearly established and implemented by the Scottish Government, to ensure that short and long term outcome trade offs are effectively debated, understood and taken into consideration.

Recommendation 23.

By 2021, a body should be given the responsibility by the Scottish Government to provide independent, long term, evidence -based advice to Scottish Ministers on investment decisions for the social, economic and natural infrastructure needs and priorities required to deliver an inclusive net zero carbon economy.

Prioritising an inclusive net zero carbon economy is part of the Strategy & Prioritisation stage of the infrastructure lifecycle. Whilst addressing all outcomes, our work has focused on delivering the key outcomes of inclusive economic growth and net zero carbon emissions across all sectors, and at all geographical levels, for public sector infrastructure decision making. It will require strong leadership and collaboration within and across the public sector to implement.
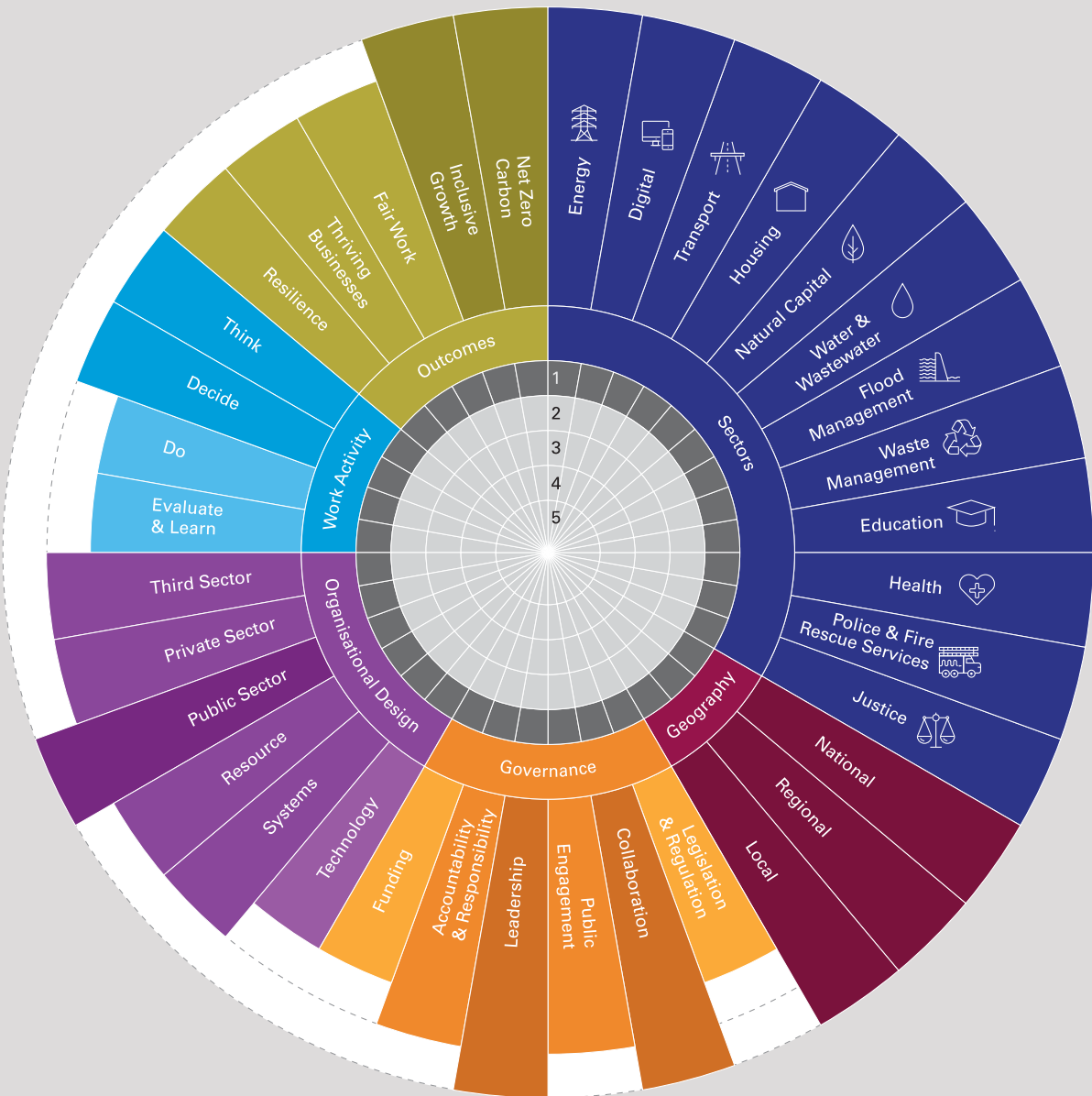
Dimensions
- ◼ Sectors
- ◼ Geography
- ◼ Governance
- ◼ Organisational Design
- ◼ Work Activity
- ◼ Outcomes

Lifecycle Stages 1-5
- **1** Stage 1 - Strategy & Prioritisation
- **2** Stage 2 - Planning & Structure
- **3** Stage 3 - Construction & Renewal
- **4** Stage 4 - Operational & Maintenance
- **5** Stage 5 - Decommissioning & Evaluation

◼ Key Focus   ◻ Lower/No Focus

Dimension Priority

- Level 3 - Very Important
- Level 2 - Important
- Level 1 - Less Important

Section **One**
Prioritising an inclusive net zero carbon economy (continued)

Independent Long-Term Advice

In order to inform the development of independent long-term advice the Commission has reviewed and identified a number of international organisations which work with government, but have independent advisory roles. The desk-based research (Appendix G: International Review of Long Term Infrastructure Strategy and Prioritisation) looked at the following organisations:

National

> UK – National Infrastructure Commission[v] (NIC)

> Australia – Infrastructure Australia[vi] (IA)

> New Zealand – New Zealand Infrastructure Commission, Te Waihanga[vii] (Infracom)

Federal

> Australia – Infrastructure Victoria[viii] (IV)

None of these organisations are involved in the delivery of infrastructure projects; nor do any hold project budgets and only the NIC provides advice within a national infrastructure spending envelope. They have all been created in response to challenges around the effective planning, prioritisation and infrastructure investment decisions within their respective countries. This section provides an overview and comparison of their approaches.

The national organisations were largely to build political consensus and to enhance the ability of governments to make long-term decisions on infrastructure needs. Infracom, for example, was created to better integrate central and local infrastructure decision making, and to shift towards an outcome focused approach, moving away from new infrastructure, as well as to enhance the visibility of a pipeline of infrastructure projects.

They each have a commitment and requirement to transparency, achieved by the publication of their research, reports, and recommendations. This is reinforced by the ability to undertake research and publish findings and recommendations on subjects of their choosing. All publications are made available to stakeholders, the public and all political parties which enables them to step outside of the political landscape and broker support across political divides, ensuring a continuation of the principles at any change of government.

All four organisations report to a nominated Minister with either an Infrastructure remit, or in the case of the NIC, for whom there is no single Infrastructure Minister, the Treasury. All of the organisations are independent statutory bodies, except the NIC, which is an executive

▶
New Hospital and Healthcare Facility, NHS Orkney.

agency. It is worth noting that the original intention was to create NIC as a Statutory Body, however, due to Brexit related Parliamentary business pressures, the legislation for this was suspended and NIC was created in its current form. Only the NIC works within a fiscal target, with their recommendations and advice needing to be consistent with an economic investment envelope of between 1.0% and 1.2% of GDP per annum.

They all develop a version of a national strategy, assessment or audit which are similarly focused, and all are refreshed every five years, or every parliamentary cycle. A key strength of these strategy documents for all of the organisations is that they are a pre-budget process and are therefore pre-allocation on a sector level, providing an opportunity

to advise governments on achieving key policy ambitions and outcomes.

For three of the organisations (IV, NIC and Infracom) there is a statutory obligation for a government response to their advice and recommendations within six to twelve months. Two organisations, NIC and Infracom, are both obligated to report on the progress that the respective governments have made against recommendations. However, in all cases, ultimately each government retains decision making and policy development responsibilities.

Although the scope of infrastructure covered by each of the organisations varies, and in part is determined by the principle aim of the organisation, all consider economic infrastructure. NIC and IA were established to consider only economic infrastructure, although IA has

recently been extended to include some social infrastructure. Infracom and IV each have a remit which includes social infrastructure. Infracom have also specified social wellbeing as part of the remit, reflective of the political environment within which the body has been established. New Zealand, as is Scotland, is a founding member of the Wellbeing Economy Governments[ix] part of the Wellbeing Economy Alliance[x]. None of the organisations have natural, blue and green, infrastructure as part of their remit, an area that was identified within the Commission's Phase 1 work as important to stakeholders and the public of Scotland.

In support of the long-term strategies the independent bodies provide advice on specific relevant topics. In the case of the NIC, IA and IV these can be mandated by the relevant Minister, but all have the scope to

"…infrastructure investment can and does play a vital role in the economy, the delivery of effective public services in Scotland and the wellbeing of its citizens… as an enabler that underpins all of our day to day lives and the world around us. The successful impact of this is a combination of how it is designed, how it is used, who uses it, where it is used and when. To ensure we achieve the outcomes that are important to us as effectively and efficiently as possible, we must focus our infrastructure resources - be that financial, natural or human - on the infrastructure system that is best able to achieve and support those outcomes."

pursue research they deem relevant. They also maintain various methods of infrastructure prioritisation, ranging from project prioritisation through to strategic needs assessment across the infrastructure system. IA and IV provide some level of specific project advice, whereas the NIC and Infracom have a strategic and coordination role, although both have the ability to review programmes and projects.

All four organisations conduct extensive stakeholder engagement, work closely with the government of the day, government departments and agencies, and run public consultation exercises. The engagement centres around their strategies', remitted infrastructure challenges or those challenges identified by the organisations. Infracom is the only one of these organisations which has an advisory role in public consultation for individual projects.

All of the organisations have independent Boards drawn predominantly from the private sector and academia, although some include individuals with government experience. It is worth noting that none of the Boards have trades union representation, an area within which Scotland has shown leadership.

The area of focus which is most clearly missing from all organisations is the evaluation of the effectiveness of the recommendations and policies advised by each of the bodies. This in itself may be a reflection of the size of the organisations and the length of time in existence for most. However, this appears to be a clear gap in the work of the bodies, or of Governments to evidence the outcomes.

When considering these comparators a number of additional factors need to be taken into consideration, including the overall decision

making landscape and political structures, be they at a national, regional (or federal) or local level, as well as the wider organisational arrangements that already exist within any given jurisdiction.

Conclusions and Recommendations

The Commission's Phase 1 Report set out recommendations to support a 30-year strategic approach to infrastructure planning and investment, and to enable government, regulators and industry to embrace independent long-term evidence-based advice. During Phase 2, the Commission has considered these Phase 1 Report recommendations, considered the evidence from its international research, as well as the systems and public organisations already in existence within Scotland. As a result, it has concluded that there are a number of examples elsewhere of successful independent advice bodies, which we anticipate would, likewise, have positive impacts if implemented for Scotland.

All of the organisations reviewed develop a national infrastructure strategy, which is refreshed every 5-years. In keeping with the remit and work of the Commission, we would expect this strategy to be applied over a 30-year timescale, incorporating a Scottish Infrastructure Needs Assessment, and supporting the existing Scottish Government-led activities.

Assessing how the Government is performing against the Commission's and the independent long-term advice body's recommendations and guidance is in keeping with the mandates for the NIC and Infracom. Going further and ensuring that an Annual Monitoring Report also evaluates the advice and recommendations provided by an independent body would evidence a commitment to a regime of monitoring and evaluation by both the Scottish Government and the Body.

The reviewed organisations conduct both autonomous and Minister-mandated research, which would be focused on achieving an inclusive net zero carbon economy within Scotland. The Commission's research highlighted that the scope to conduct independent research enables the body to evidence their independence across the political spectrum. Mandated research could be specified in an annual remit letter to ensure a clear set of responsibilities and clarity on the relationship with government.

All of the independent advisory bodies made significant use of public and stakeholder engagement to enhance and better inform strategic planning and infrastructure decision making, by understanding the trade-offs at a spatial and service level. The Commission has recognised throughout its work the invaluable input from both infrastructure experts and users and would endorse this commitment going forward for independent long-term advice.

In order to support the achievement of their work, the independent long term advice organisation would need to sit outside the political decision

Recommendation

making system to enable it to operate in an arms-length and transparent way which builds confidence for public and private sectors as well as civic society and the public. Considering the international research further, the Commission would envisage an organisation which:

> Has a remit for economic, social and natural infrastructure;

> Operates at arms-length from formal political decision making;

> Reports to a senior Government Minister but is an independent Body with an independent Board and appropriately experienced and resourced organisational structure and staff;

> Will operate on a 'no surprises' basis with Government/Parliament (for example, autonomous research will be publicised) to build strong working relationships;

> Have a statutory right to a government response to reports and recommendations within a defined timescale of publication; and

> Have a statutory right to be provided with research and data by government departments and agencies to successfully carry out their work.

On this basis it is recommended that:

1. By 2021, to enable prioritisation of an inclusive net zero carbon economy in infrastructure planning over a 30-year period an independent specialist body should be given the following responsibilities by the Scottish Government:

   > Develop a 30-year infrastructure needs assessment and strategy, refreshed every 5-years for all public and private infrastructure;

   > Undertake regular strategic public engagement to inform the long term strategy;

   > Provide strategic challenge to the Government of the day; and

   > Undertake one-off strategic reviews and research.

Cross-Government Infrastructure Decision Making

The Scottish Government is central to developing the detailed policies and plans to enable the long-term infrastructure vision to be delivered and maintained. Building on the Commission's Phase 1 Report research and findings and the specific Phase 1 recommendations, 2 (Assessment Framework and Methodology), 3 (Needs Assessment), 4 (Infrastructure Investment Plan) and 5 (Place Based Housing and Industry Assessment) it became evident that a system wide approach to analysis and decision making is critical, alongside consideration of interdependency between infrastructure sectors and portfolios.

This need for greater cross sector decision making was identified by the Scottish Government in 2017 within the Places, People and Planning: Consultation on the Future of the Scottish Planning System[xi]. They stated that 'There is a need for better coordination of infrastructure planning at a national and regional level. This will require a stronger commitment to delivering development from all infrastructure providers'. 'We need to have leadership, skills, resources, and partnerships to proactively and consistently support development, investment and quality of place across the country' was highlighted within the Ministerial Position Statement[xcix] in response the consultation findings.

Within the Scottish Government, as with most governments, budgets are allocated to sectors or departments based upon an assessment by those sectors of their needs over the coming year and/or parliamentary term. For the Scottish Government, these plans are set out within its Programme for Government[xii] (PfG). To support the PfG work, and to set out guiding principles internally and to inform the wider public sector, businesses, the third sector and the public, the Scottish Government has a number of strategies, frameworks and action plans. Examples, but by no means all, relating to infrastructure are detailed below:

> **National Infrastructure Mission**[xiii] – to increase Scotland's annual infrastructure investment by an additional £1.5bn by the end of the next parliament – a total of £7bn additional spend; on a baseline of £5.2 bn in 2019-20;

> **National Planning Framework**[xiv] – the spatial plan for Scotland that sets out where development and infrastructure is needed to support sustainable and inclusive growth;

> **Infrastructure Investment Plan**[xv] – setting out the Scottish Government's priorities for infrastructure and plans for specific infrastructure projects;

> **Medium Term Financial Strategy**[xvi] – setting out the key financial challenges and opportunities, providing the context for the Spending Review and the Scottish Budget;

> **National Transport Strategy 2**[xvii] – setting out the vision for a sustainable, inclusive, safe and accessible transport system;

> **Scotland's Economic Strategy**[xviii] – sets infrastructure at the heart of the strategy;

> **The Environment Strategy**[xcii] – setting the vision that by 2045 there will be net zero emissions in Scotland, placing the natural environment in Scotland as a national asset which is fundamental to health, quality of life and the economy;

> **Climate Change Action Plan**[xix] – providing a path to net zero emissions by 2045, including ambitious interim targets;

> **Realising Scotland's Full Potential in a Digital World**[xx] – noting that digital has the same importance as other utilities, focusing on building digital infrastructure resilience;

> **Local Development Plans**[xxi] – required for each council, allocating sites, either for new development or sites to be protected. The Plan also includes policies which guide decisions on planning applications;

> **Place Principle and Place Standard**[xxii] – focusing policy development on place making, promoting a more joined-up and collaborative approach to services, land and buildings within a place;

> **Economic Action Plan**[xxiii] – bringing together all actions the Scottish Government is taking to support and grow Scotland's economy, infrastructure is detailed within the investment section;

> **The Fair Work Action Plan**[xcx] – forms part of a suite of Labour Market Action Plans being developed by the Scottish Government to help focus policies and resources on progressing national indicators and delivering national outcomes and contains a specific section on the construction sector;

> **Energy Efficient Scotland**[xxiv] – improving the energy efficiency of homes, businesses and public buildings as well as working with Local Authorities to develop local heat and energy efficiency strategies ;

> **NHSScotland Infrastructure Investment Programme**[xxv] – sets the programme of capital investment for the NHS in Scotland; programmes follow the Scottish Capital Investment Manual and decisions made by the Capital Investment Group;

> **Land Use Strategy**[xciii] – providing policy guidance for the Principles for Sustainable Land Use and relating the principles to the objectives relating to the economy, environment and communities;

> **Learning Estate Investment Programme**[xcv] – the £1 billion investment programme which supports Scotland's Learning Estate Strategy[xcvi];

> **Housing to 2040 Strategy**[xcvii] – recognising the vital role of housing and setting out the vision of how homes and communities will look and feel in 2040, consultation commenced in December 2019 with the Strategy to follow in due course; and

> **Strategic Transport Projects Review 2**[xcviii] – will inform transport investment in Scotland for the next 20 years and will help to deliver the outcomes set out in the National Transport Strategy 2.

These strategies and policies evidence some of the cross-cutting programmes which are either aimed at supporting infrastructure, or place infrastructure clearly at the heart of the achievement of outcomes for Scotland. They show that joint working does occur and that cross pollination of ideas and information sharing is a regular occurrence. However, the issue becomes more challenging when expenditure is involved, with separate budgets allocated for the different portfolios or sectors. For example, evidence was provided within the Commission's Phase 1 stakeholder engagement that Health, Justice, Local Authorities and the Scottish Fire Service can all be working on projects in the same 'Place' but may not have the appropriate structures to enable suitable joint assessment and cross sector prioritisation.

Building on work already commenced within the Scottish Government, it is critical to embed an outcome based decision-making structure which operates at a cross-infrastructure level, incorporating both spatial and sector needs. It would be completed prior to budget allocations, to ensure infrastructure spending focuses on the overall outcomes that Scotland is aiming to achieve, an inclusive net zero carbon economy. This would support the implementation of the findings of the Commission Phase 1 Report that identified an increased need for system wide thinking, and a defined approach to cross sector trade-offs required to deliver an outcomes-based approach to decision making.

Figure 1 on the following page shows the Commission's proposed approach to support outcome-based decision making, how independent long-term advice and the Scottish Government would interact and complement each other to provide the strategic decision-making process necessary to achieve the outcome of an inclusive net zero carbon economy through infrastructure. It incorporates the current Scottish Government activities, the Commission's Phase 1 recommendations, and the Phase 2 recommendations, with Appendix H: System Wide Prioritisation, providing additional detail.

Conclusions and Recommendations

Ultimately, investment decision making is the responsibility of the Government, however, for the functions and governance arrangements of independent long-term advice as described above to work effectively, an infrastructure planning, prioritisation and investment decision making structure is needed within the Scottish Government, government agencies and local authorities. This would work on a system wide cross-government, portfolio and sector basis, focused principally on outcomes. It would enable the independent long-term advice and Scottish Government decision making to complement and mirror each other, supporting effective decision making, as shown in Figure 1.
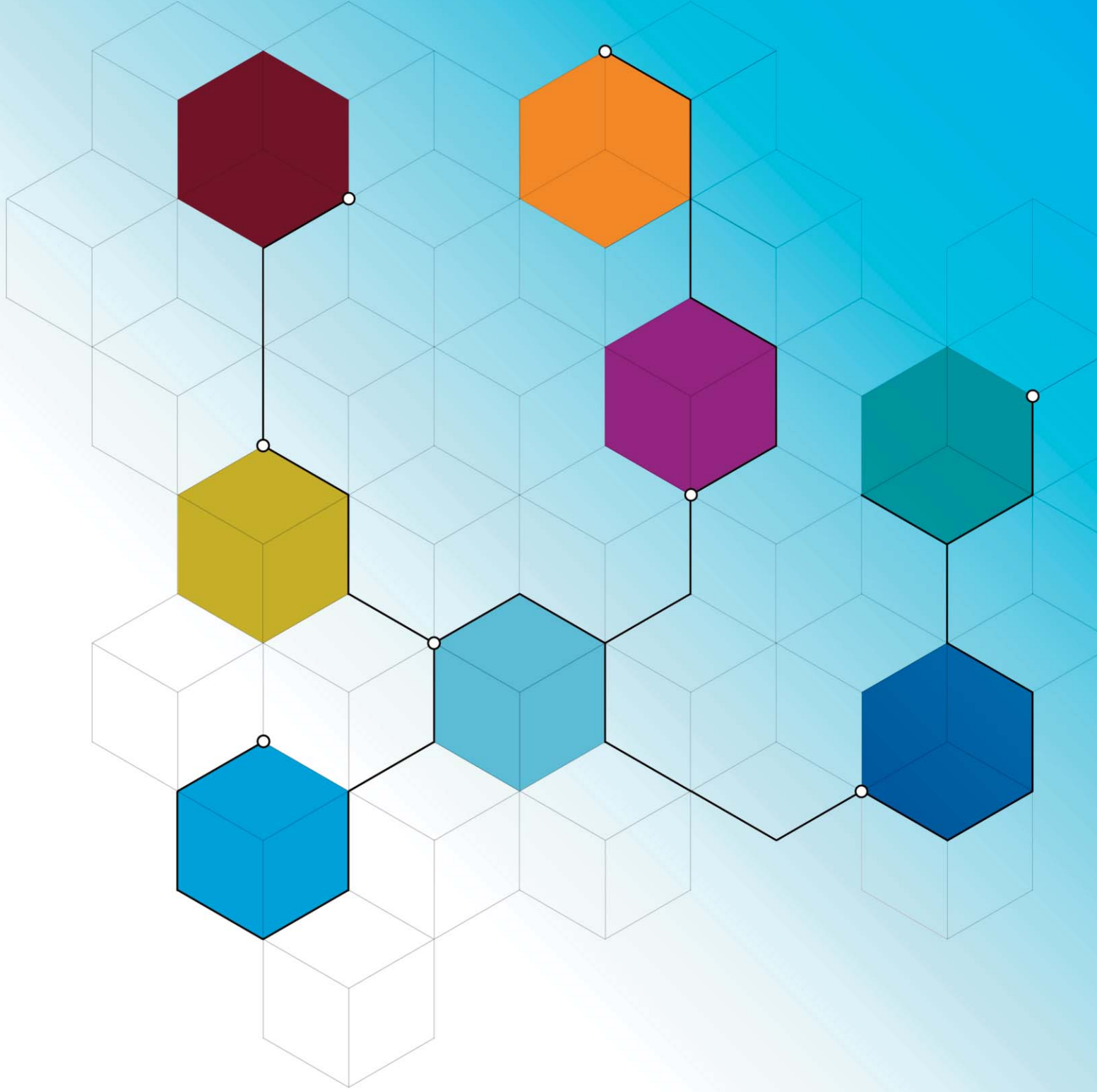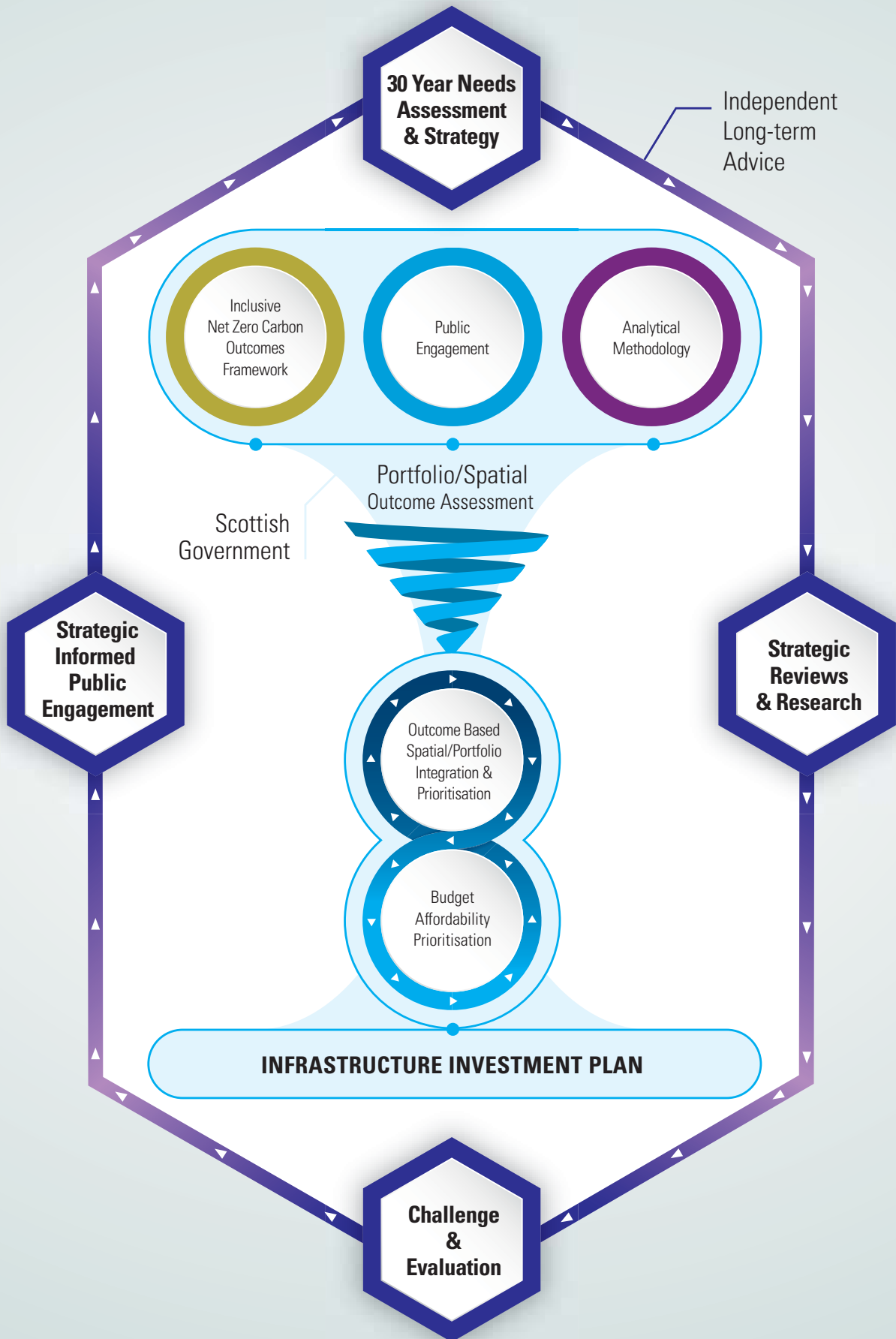

Recommendation

On this basis it is recommended:

2. To support infrastructure decision making that will prioritise an inclusive net zero carbon economy, the Scottish Government should:

   > Ensure, and where possible accelerate, implementation of our Phase 1 Report recommendations 2 (Assessment Framework and Methodology), 3 (Needs Assessment), 4 (Infrastructure Investment Plan) and 5 (Place Based Housing and Industry Assessment); and

   > By the end of 2021, introduce an outcome-led, integrated cross-infrastructure prioritisation approach that incorporates and balances spatial and sector needs; the output would inform affordability assessment and budget allocation of infrastructure funding.

Figure 1: Integrated prioritisation and strategy

30 Year Needs Assessment & Strategy

Independent Long-term Advice

Inclusive Net Zero Carbon Outcomes Framework

Public Engagement

Analytical Methodology

Portfolio/Spatial Outcome Assessment

Scottish Government

Strategic Informed Public Engagement

Strategic Reviews & Research

Outcome Based Spatial/Portfolio Integration & Prioritisation

Budget Affordability Prioritisation

INFRASTRUCTURE INVESTMENT PLAN

Challenge & Evaluation

Section 2:
Enabling Sustainable Places

PHASE 2: DELIVERY FINDINGS REPORT

Section **Two**

Enabling Sustainable Places

Introduction

Defining place highlights how individual our experience of places is. In the Place Principle[xxvi], Scottish Government has defined place as:

> *where people, location and resources combine to create a sense of identity and purpose, and is at the heart of addressing the needs and realising the full potential of communities. Places are shaped by the way resources, services and assets are directed and used by the people who live in and invest in them*

Places therefore could be considered locations with meaning, reflecting our interaction and relationship to them. Places can also be at any scale and are constantly changing, as the people, resources, assets and even neighbouring places change. As such, they are dynamic, as is our response and use of our places. Infrastructure has a role in enabling sustainable places, responding to their dynamic nature, whether that be their buildings, green and blue networks, or utilities. This is anticipated to be increasingly relevant post Covid-19 as we re-assess where we spend our time and whether those places provide everything we now want or need.

As the Scottish Government's definition indicates, each location is unique, with different assets, anchor organisations and priorities. Investments, including infrastructure, should emerge from a recognition of this baseline and a clear understanding of outcomes being sought. This aligns with a number of our recommendations in Phase 1 where the role of place was firmly acknowledged; for example, the need to establish an assessment framework that is guided by settlement (including housing), industrial and labour & skill strategies, based on achieving an inclusive net zero carbon economy (in recommendations 2, 3 and 5 from our Phase 1 Report). In this way, there is a coherent framework for developing our places. This definition also supports our recommendation (recommendations 7-10 from our Phase 1 Report) that we make better use of our existing assets; and we take a more comprehensive approach to community engagement (through recommendation 22 from our Phase 1 Report), thereby in the context of place ensuring we are investing in what is needed.

Places are therefore at the intersection between the ambition of an inclusive net zero carbon economy and the right infrastructure. The Place Standard Strategic Plan[xxvii] already emphasises the central role of our places to achieving an inclusive net zero carbon economy, therefore reflecting on places allows us to illustrate where improvements in infrastructure would be valuable, supporting communities to achieve their full potential.

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Sustainable Places.
Scottish National Heritage

As we will see in some of the highlighted case studies, to develop a place vision and deliver it, effective collaboration is essential; both with the community and with delivery stakeholders. To achieve full benefit, this goes beyond co-operation, which is concerned primarily with sharing information, and even co-ordination, where there is greater alignment of organisational investment, to collaboration where this alignment moves to shared outcomes and accountability.

While the role of place was universally supported through both Phase 1 and Phase 2 engagement, there was however, a recognition that we have not always got it right. Yet with the evolution of a place policy framework which includes guidance such as the Place Principle and tools such as the Place Standard, there is now a greater opportunity to achieve a consistent approach.

There are however often barriers to enabling sustainable places. This can be seen in new housing developments where infrastructure is poor and relies on personal car travel to access services, creating further

road congestion; or the out-of-town retail parks which have contributed to the demise of many, already frail, town centres. In the examples given, there is a recognised need for additional housing or new jobs which are often strong drivers when consenting for planning; and equally these sites may provide developers with the best financial return. However, the trade-offs illustrated are often insufficiently considered or addressed by these and other stakeholders.

Investment decisions also need to be fully embedded in the priorities of an inclusive net zero carbon economy, with the appraisal system to support it, as detailed in Phase 1. While there are clear areas for improvement within some of our existing systems and behaviours, there are also areas of opportunity, such as the use of emerging digital technology, perhaps even more relevant in a post-Covid-19 world; or using existing assets and resources more effectively, a key theme in Phase 1. This includes natural capital, which is integral to sustainable, liveable and healthy places. This section of our report will therefore discuss systems and behaviours, enabling digital technology and

resources, as key components of enabling sustainable places.

Finally, our engagement has emphasised that maximising the benefits of place is also about understanding which actions and interventions work best at national, regional and local/settlement levels; and how the different parts connect (Appendix I: Enabling Sustainable Places Engagement Report). In Phase 1 we recommended the National Planning Framework 4 (NPF4) should be developed through the lens of an Infrastructure First model, based on an outcomes-based approach to spatial planning, integrated across the national, regional and local. This would ensure that decisions are made from an understanding of the enabling infrastructure needed for places and how the cost of that is equitably spread amongst stakeholders, thereby supporting market transparency. While place has been increasingly at the heart of policy developments, to ensure infrastructure and related services meet communities' needs, this should include a geography-specific approach aligned around an inclusive net zero carbon economy. We consider this spatial component further in the below sub-sections.

Our work on enabling sustainable places has primarily focused on Stage 1 (Strategy & Prioritisation) and Stage 2 (Planning & Structuring) of the lifecycle stages, with later stages considered in the section on delivering a thriving construction market. The issues of place are multi-dimensional, which is reflected in the large cross sections of dimensions that we have considered, with a particular emphasis on governance, geography and organisational design. Our sector focus has principally been on enabling infrastructure such as utilities, housing, health and education.
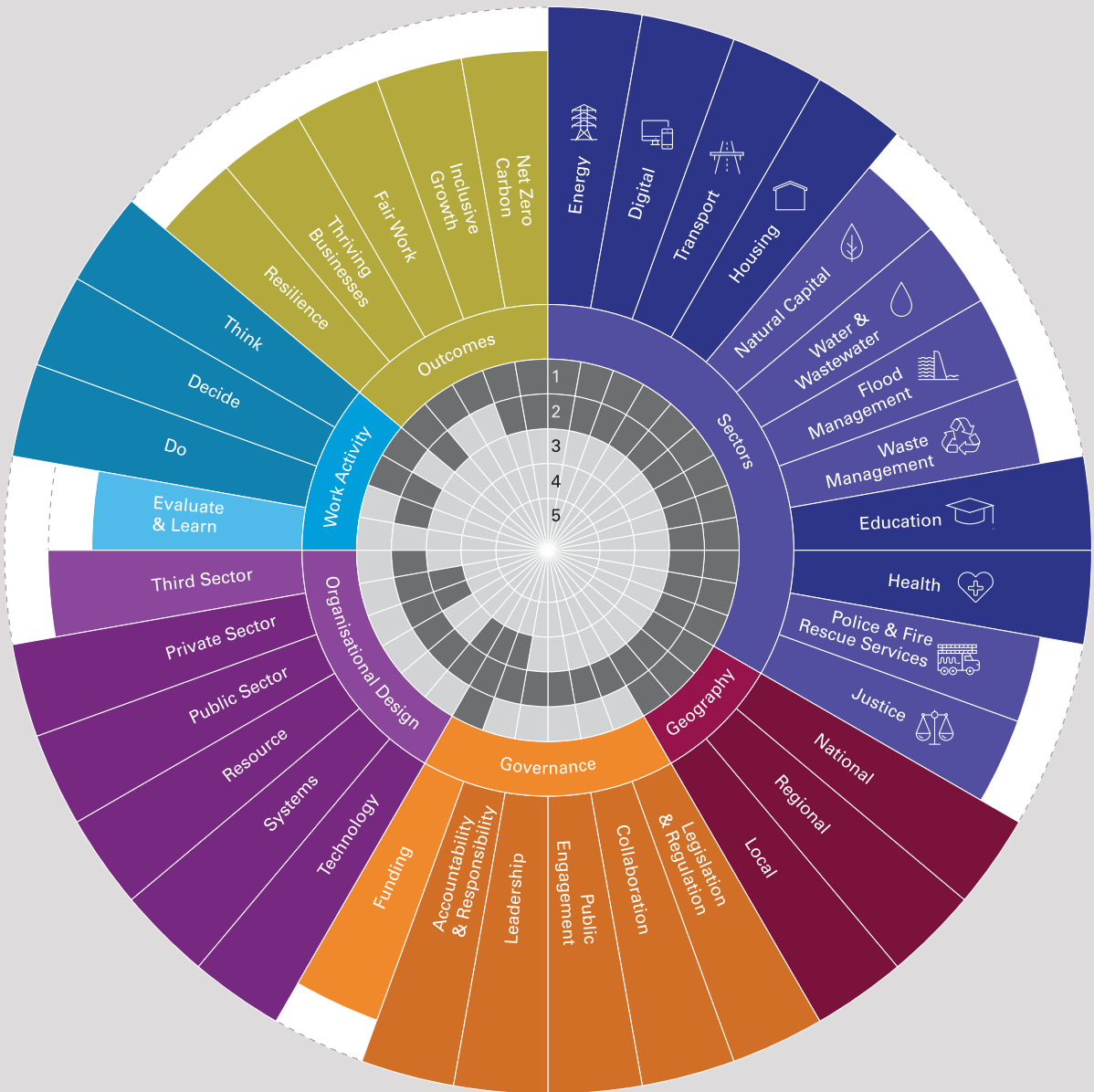
Dimensions

- Sectors
- Geography
- Governance
- Organisational Design
- Work Activity
- Outcomes

Lifecycle Stages 1-5

1. Stage 1 - Strategy & Prioritisation
2. Stage 2 - Planning & Structure
3. Stage 3 - Construction & Renewal
4. Stage 4 - Operational & Maintenance
5. Stage 5 - Decommissioning & Evaluation

Key Focus   Lower/No Focus

Dimension Priority

- Level 3 - Very Important
- Level 2 - Important
- Level 1 - Less Important

Systems & Behaviours

Scotland has a well-developed policy system, supported by legislation and regulation as appropriate. Within this broad system, place has been a focus for some time, however much of the application of this policy has been voluntary, supported by guidance, such as the Place Principle noted above and methodologies such as the Place Standard[xxviii]. Ironside Farrar in their research for Scottish Government on the effectiveness of Scottish planning policy[xxix] noted that practitioners were often unclear on policy and the level of obligation in taking a place approach. In addition, as previously noted, stakeholders seek to balance a number of priorities, often with constrained resources. In this context, keeping place as a key priority can be difficult within a voluntary framework; and yet taking a place-based approach can provide an opportunity to bring together different strategies and align outcomes, both across and within organisations. This is important both for efficiency and implementation, but also for market transparency, a central issue in supporting infrastructure development.

There are public sector systems which seek to develop places using a collaborative approach; either from the perspective of local services at the local authority area, as with Community Planning Partnerships (CPPs) or considering land use at different spatial levels, via the Planning Scotland Act 2019[xxx] and National Planning Framework 4 (NPF4). Each of these systems has a role in the creation of sustainable places, though stem from different legislation, and in the case of CPPs and NPF4 also have different supporting processes and accountability structures. Despite this, where there is an overlap of objectives, there can be a case for greater collaboration. Achieving effective collaboration is challenging however, and simply requiring collaboration is not, of itself, sufficient to ensure that outcomes are improved or efficiency is achieved, which is of course the goal. As Audit Scotland noted in 2018[xxxi], CPPs function within a crowded landscape, with challenges of accountability, undermining the potential of collaboration. This illustrates the difficulties in applying one public policy effectively, without seeking to align to another policy area; and yet the often siloed approach to our systems is seen to undermine best outcomes and potentially put unnecessary strain on resources. Instead, greater collaboration could see more efficient use of those resources, as well as accessing the resources of new partners. What Works Scotland, in reviewing how the 2011 Christie Commission[xxxii] on public sector reform could be implemented[xxxiii], also found that implementation of a collaborative approach is patchy. Often undermined by culture, both mindset and practice. As such collaboration is noted as the "most challenging dimension of public service reform"[xxxiv]

One such challenge is to avoid further crowding of the policy and practice landscape. For example, an area of potential overlap for CPPs and the planning system are Locality Plans,[xxxv] which are developed by CPPs for smaller settlements, and the Local Place Plans[xxxvi] included in the Planning Scotland Act (2019). As seen, these systems have emerged from different policy priorities, however where there are shared objectives within a place, there may be benefit to greater co-ordination of these plans, resulting in shaper focus on delivery.

An opportunity for enabling better places is NPF4. This is currently in development and is intended to create a more co-operative approach to spatial planning, where national, regional and local are in step with each other. This is anticipated to be facilitated through the co-design of NPF4, including the consideration of indicative regional spatial strategies prepared by regional authorities. NPF4 therefore appears to bring an improved vertical alignment of spatial planning, managing and reinforcing priorities across spatial levels. During our engagement stakeholders expressed support for such alignment, yet also had concerns that there was limited evidence of co-design of NPF4 at this stage, nor a clearly communicated strategy and resource commitment to achieve this co-design. As this is seen to be central to a more co-ordinated approach to spatial planning, this co-design is considered an

> As such collaboration is noted as the "most challenging dimension of public service reform"

Compute Scotland

Section **Two**
Enabling Sustainable Places (continued)

essential component of NPF4. More recently Scottish Government has worked with Heads of Planning Scotland to run a programme of virtual support including online seminars to share learning and ideas, as authorities develop their collective thinking on indicative regional spatial plans. Whilst the process for NPF4 is in its early stages, continuing to address these concerns is important, and if implemented effectively, NPF4 offers a clear opportunity to drive collaboration and co-design across Scotland.

An Infrastructure First Approach, discussed in our Phase 1 report, seeks to develop a more co-ordinated approach to places, including managing some of the risk allocation in delivering on enabling infrastructure. This includes how utility companies can undertake future investments in a cost-effective and co-ordinated fashion, an often-identified barrier to the development of new and existing sites. Scottish Government has been developing approaches to this challenge and, alongside others, has been working with the Infrastructure Delivery Group[xciv], which brings together a range of infrastructure providers.

Another area of risk management universally asserted by stakeholders, is the need for more market transparency and co-ordination in developer contributions. The Scottish Government notes a programme of work will be brought forward to capture developer contributions, with land value uplifts[xxxvii], as well as an infrastructure levy being included in the Planning Scotland Act 2019[xxxviii]. The need for a more cohesive and collaborative approach to developer contributions, which reflect different spatial infrastructure needs, is clear. The joint Land Commission & SFT Interim Report on Enabling Infrastructure[xxxix] identifies the need for clarity on obligations based on a spatial plan, which enables implementation of the existing localised Section 75[xl] system. Alongside this, the report recommended a new Land Value Capture system for wider strategic infrastructure, acknowledging that infrastructure does not always align with authority boundaries.

An example where a positive place outcome has been achieved through increased collaboration and the use of digital technology is the Metropolitan Glasgow Strategic Drainage Partnership[xli] (MGSDP). This is a significant project seeking to reduce flood risk and improve water quality across the region, while also supporting economic development, social outcomes and habitat improvement. The core partners include Glasgow City Council, South Lanarkshire Council, North Lanarkshire Council, East Dunbartonshire Council, Renfrewshire Council, SEPA, Clyde Gateway, Scottish Canals, Scottish Government, Clydeplan and Scottish Enterprise. The partnership has achieved a more integrated investment approach, as seen in the Glasgow Smart Canal scheme[xlii]. This saw the introduction of predictive weather technology and "smart" automation of the canal to create capacity for new development and prevent flooding by directing excess surface water run-off to capacity created in the canal, through dynamic management of the water level.

The Smart Canals project demonstrates a combining of organisational objectives and assets, to achieve a more efficient outcome for all parties, including unlocking development land in the north of the city.

Further examples where place is central to decision-making are the Granton Waterfront in Edinburgh[xliii], or the work of both the Comhairle nan Eilean Sar[xliv] and North Ayrshire Council[xlv], where a process of community wealth building has been used. Community wealth building is "a people-centred approach to local economic development"[xlvi] which includes a focus on community engagement and an understanding of both existing assets and opportunities for development. The approach encompasses many of the concepts of inclusive economic growth, with 5 principles, including: plural ownership of the economy; making financial power work for local places; fair work and just labour markets; progressive procurement of goods and services; and socially productive use of land and property. These place examples demonstrate a collaborative and community-focused approach, with inclusive economic growth a core priority. Collaboration was facilitated by either agreeing shared outcomes, or through giving sufficient space within the programme for organisational priorities to be recognised. Concepts of reciprocity are seen to be part of this approach to collaboration. As with the MGSDP, this requires an understanding of the interdependencies of assets, a conscious approach to outcomes, supported by consistent leadership, accountability and resourcing, both skills and funding. These have to be developed through conscious effort and commitment of all parties. Good collaboration happens; however, making such good practice normal practice requires system change. System change creates the conditions for culture change.
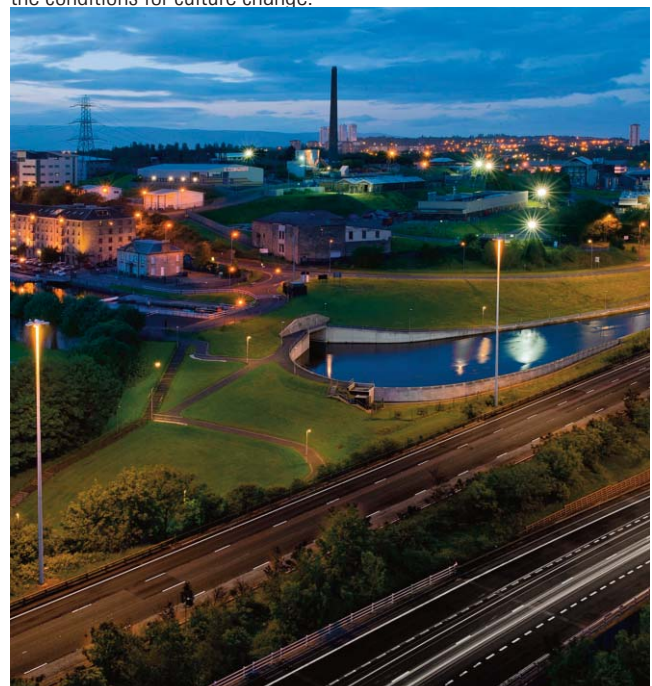
Enabling Sustainable Places:

Granton Waterfront Regeneration

Granton Waterfront is a new waterfront district of Edinburgh, being developed from former industrial land, sitting alongside Edinburgh's old and new towns.

Granton is being developed and delivered by the City of Edinburgh Council along with partners including the surrounding communities, Edinburgh College, Scottish Government, National Museums Scotland and the National Galleries of Scotland.

There were seen to be a number of existing assets and projects to frame the development and partnership, including significant public-sector-controlled land and assets; partners' involvement in local projects; available built heritage; and under-utilised blue and green infrastructure. The existing asset base and priorities is reflected in the vision for the area, which is to transform the area over the next 10-15 years, from a post-industrial site into a vibrant new coastal town where people live, visit, travel and grow the economy in an inclusive and considerate way. The programme includes creating a significant coastal park, with around 10,000 sqm of new commercial/retail space, a new school, healthcare facility and high-quality public realm, contributing to

- Scotland's response to the climate emergency, by building with nature and allowing flexibility to adapt and respond.

- Promoting inclusive economic growth by systematically addressing barriers to participation in the labour market and facilitating the creation of high-quality new jobs, affordable homes and work spaces.

- Creating sustainable places. The Council own over 120 acres of developable land which provides an opportunity to lead and establish the standard for a quality and sustainable place.

The development of the physical place has been supported by a number of service developments and strategies. This includes a learning strategy, which seeks to ensure Granton and surrounding communities can take advantage of the economic and social opportunities within the area. This recognises learning happens across communities, both in and outside of physical buildings; and both formally and informally.

▶

"Quite simply, better decisions, based on better data will lead to better outcomes for citizens. This is the essential promise of the information age."

Mark Enzer, Chief Technical Officer,
Mott MacDonald

Head of the National Digital Twin programme,
Centre for Digital Built Britain

▼

Scottish Enterprise among
supporters of new innovation
exhibition

Enabling Digital Technology

As noted in the above examples, a granular evidence base is essential
to inform decisions. The role of digital technologies to both support
development of an improved geospatial evidence-base as well as more
efficient processes was discussed in our Phase 1 report. This included
a recommendation on reviewing the integration and potential use of
digital data technology within publicly funded buildings, to make them
fit for the future and to give ready access to facility management data.
The opportunities for digital data to enable sustainable places are
extensive. This includes the capture and management of demographics
data by National Records of Scotland which has a role to understand
the current and projected settlement of Scotland's population, informing
infrastructure investment policy. Or in the development of innovative
tools such as Historic Environment Scotland's new digital survey tool[xlvii]
which provides the information for assessing and managing their assets
and therefore places, more efficiently than manual methods. Or as an
engagement tool, as seen by the extensive use of video-conferencing
during the Covid-19 lockdown.

Scottish Government has a number of programmes underway to support
the potential of digital infrastructure in Scotland, aligned to its 2017
digital strategy[xlviii]. This includes a focus on connectivity which again
the Commission stressed in its Phase 1 work; as well as the potential
for public sector reform, in support of the economy and improvement to
working practices. This work acknowledges the importance of data and
the need for open data[xlix] and the establishing of a Scottish Spatial Data
Infrastructure site[l] to enable people to find and use publicly available
spatial data. Some cross-organisational data collation is also already
in place. Since 2016 the Improvement Service has collated a number of
local authority and national parks spatial data on the Spatial Hub[li]. This
seeks to comply with the EU Inspire Directive, to inform environmental
policy making and includes common technical standards for publishing
spatial datasets[lii]. This collation in a single place is clearly an efficient
approach to data collection, although has required the Improvement
Service to standardise and quality review data.

Availability of appropriate and timely data needs to be a focus in
supporting places. For example, data is a key component of an
Infrastructure First approach, which as noted in Phase 1 is seen to
support market transparency, thereby unlocking development. It is also
essential to support the priorities of area-based local health and energy
efficiency strategies, as seen in the review of the 2018 Energy Efficiency
Scotland Programme[liii]. Yet, useful data at times has not been collected,
or if available is not open-source, can be costly, or isn't in a meaningful
or consistent format. While the potential of data is therefore
acknowledged, gathering and curating data is not always simple. There
is currently no co-ordination of many data sets out-with the public
sector, creating duplication of effort; and public sector data is not always
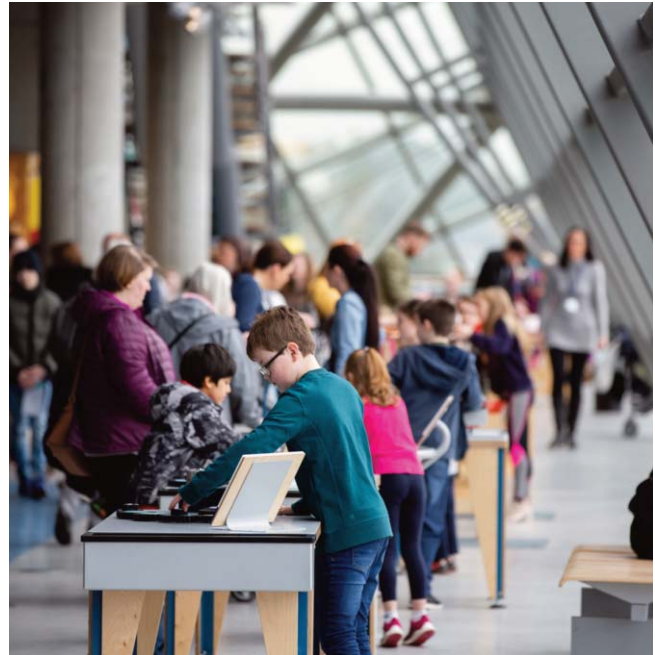
in an appropriate format or regularly updated. Concerns around data
privacy have also created barriers to the sharing of available data, even
where there is a clear public good argument. In addition, data is seen
increasingly to have a value, commercial or otherwise, which if charged
for can restrict access, yet who should benefit from this value which
extends to data on people and communities, is not consistently applied.

The Greater London Authority (GLA) have developed an Infrastructure
Mapping Application[liv] which, through building long-term relationships,
has brought together source data for utility and transport providers and
33 local authorities. It is understood that what may be considered
commercially sensitive data is not open-source, instead has only been
made available to GLA to support their decision-making and to co-
ordinate collaboration activities. This activity was directed by the Mayor
who secured commitment from the sector and is supported by legal
agreements with the utility providers, to manage the use of their data.
While not open-source, this example illustrates how a co-ordination of
data can support both better decision-making, as well as demonstrating
the role for strong leadership. Both of these are central to an
Infrastructure First approach. The GLA co-ordination role here was
significant, as there is currently no requirement for data sharing of this
kind, relying instead on relationship building. Another example of digital
mapping is in Helsinki. Helsinki 3D[lv] has seen a digital twin of the city
developed by the city administration, following international standards.
Helsinki began using digital mapping technologies in 1985, therefore
this resource has developed to support a number of policy areas, as
broad as smart traffic and transportation; education and research; and
carbon neutral ambitions.

Helsinki 3D+
Digital Twins

Since 1985 the City of Helsinki administration has been developing digital city mapping, to support policy and investment decision-making. The first whole city 3D model was completed in 2002.

Helsinki 3D runs two 3D processes – A Reality Mesh model and Semantic CityGML Model. The Semantic model reflects the current international standard, while the Reality Mesh is more current technology, with a number of quality advantages.

Amongst others, the application of data sources crosses analysis, visualisation, data integration, registers, statistics, big data, energy & emissions, alternative energy, visibility, shadows, measurement and tracking. Within this potential, Helsinki has demonstrated the value of the city models in the areas of:

- Carbon Neutral City
- Smart City
- Education and Research, with university collaboration, as well as student access to the models

- City Planning
- Communication and interaction
- Smart Traffic and Transportation
- Project Management

Benefits are seen in the area of efficiency, productivity, improved planning, better monitoring, transparency and management.

Helsinki 3D have identified the six challenges facing 3D data as: consistency between models; standardisation; data quality; data interoperability; data maintenance/governance; and moving from utopian pilots to real-world use cases.

What Works Scotland published a case study report on asset mapping in 2017[lvi] illustrating the Thriving Places series in Ruchill and Possilpark in Glasgow. Thriving Places is an initiative of the Glasgow Community Planning Partnership. The case study noted a number of issues including inadequacy of mapping; problems with clarity of use and overall value, often due to ineffective use of mapping tools; and lack of community ownership of data. Maps had however supported some level of organisational collaboration and were seen as a key component to create successful places. A number of recommendations in the report illustrate the data challenges, including identifying a focus on the why of mapping and that communities need to be involved to take ownership of their area data.

What is clear from our engagement is that there is no end to how data can be used and a recognition that future uses are as yet unknown. As with Systems & Behaviours however, it is important to both maximise opportunities and minimise unnecessary burdens on stakeholders where use is not yet clear. In the case of data, the scale and range of current data available and being gathered is not an efficient or valuable approach to inform place development. In addition, the resources required to develop data sharing for even small projects can be significant. Finally, addressing the lack of open source access and charging regimes are also key challenges.

Resources

Developing sustainable places is no simple task, requiring a range of resources in which the right skills cannot be underplayed. As we seek to drive an inclusive net zero carbon economy, these skills are increasingly multi-disciplinary. Indeed, places have complex and changing needs, covering not only the infrastructure, but the people, services and assets at their heart. The infrastructure component cannot sit in isolation from this wider picture, therefore the skills to support sustainable places also reflect this dynamic position.

However, as we anticipate the ongoing need for efficiencies in the public sector post-Covid, it cannot be assumed that additional resources will be readily available. While the examples above have shown that a collaborative approach to places works well, it requires an identification of shared outcomes, or as a minimum an understanding and recognition of each organisation's objectives and where reciprocity can be used to engender collaboration. Local authorities often play that public sector central role, yet their resources have been reduced through austerity as well as managing an expanding range of priorities. In addition, the construction sector workforce is ageing, with a decline in those still working after the age of 55[lvii], yet with challenges in replacing skills amongst a younger group, as will be further discussed in the next section of this report. The solution is not always to expand organisational resources, as it is also recognised that some skills are not needed on a regular basis. Instead, as the narrative of "one public sector" suggests, with increasingly shared outcomes and accountability, how skills can also be shared should be included in the approach.

The longer-term structures and systems that have emerged from the regional City and Growth Deals are an example where shared resources are increasingly being used for a common goal. These structures vary across the country, however they are generally groupings of Local Authorities which have come together to establish a collaborative approach to the development of their region. Within the Glasgow City Region Partnership[lviii] eight local authorities are collaborating to develop the region together. This has included work undertaken by Clydeplan[lix], the Strategic Development Planning Authority for the area, who in 2017 refreshed the area's Strategic Development Plan[lx]. Amongst other projects, Clydeplan are currently supporting the co-ordination of an Infrastructure and Assets portfolio, with the working group chaired by East Renfrewshire Council. Collaboration has taken the form of exchange of data and knowledge, not only amongst the authorities, but also utility providers and other private sector partners. This approach is developing a greater collective

understanding of the issues and challenges in making best use of assets. It is worth noting however that the skillset within any region or authority will vary, at times requiring to be procured to address gaps should finances allow. In addition, regional and growth deals focused on conventional short-term economic growth approaches, rather than wider inclusive net zero carbon objectives[lxi]. The evolved deal governance structures need to commit to collaboration which takes this wider view of development, beyond traditional growth models.

Another group of key stakeholders in infrastructure development is the private sector, who deliver infrastructure, with their commercial decisions often influencing the quality of our places. Equally, private sector skills are valued and there are increasing examples of public private partnerships which have unlocked development sites. Fusion Assets[lxii] for example is a Special Purpose Vehicle (SPV) in North Lanarkshire which enters into partnership with the private sector to develop brownfield sites for economic development and housing. The SPV manages risk through initial enabling investments, creating the conditions for collaboration with the private sector. This is suggested to be a good example of how moving beyond a simply commercial relationship often driven by lowest cost and instead to one of co-design and best value supports the objectives of infrastructure development and place. Some of these points will be picked up in the following section on Delivering a Thriving Construction Sector.

However, the skills to develop sustainable places don't only sit with the public or private sectors, but also with the communities with which they serve and interact. Community partnership and collaboration have been recognised as essential to improving Scotland's public services for some time. The 2011 Christie Commission[lxiii] noted the value of bringing together assets and skills to improve public service delivery; and the Community Empowerment (Scotland) Act 2015[lxiv] sought to embed some of these recommendations in practice, including CPPs as discussed earlier. We also recommended in Phase 1 that there should be much greater participation of the public in infrastructure decision-making. This should include an acknowledgment of the skills of communities and their ability to be full partners in the development of their places.

Conclusions & Recommendations

As noted in the introduction to this section, places are at the intersection between the ambition of an inclusive net zero carbon economy and the right infrastructure. Understanding and responding to the needs of places is therefore central to achieving the Commission's vision, as seen in Phase 1. While the language and objectives of place continues to be widely accepted, the good practice approaches are often in pockets and dependent on good-will to achieve appropriate collaboration. Yet this
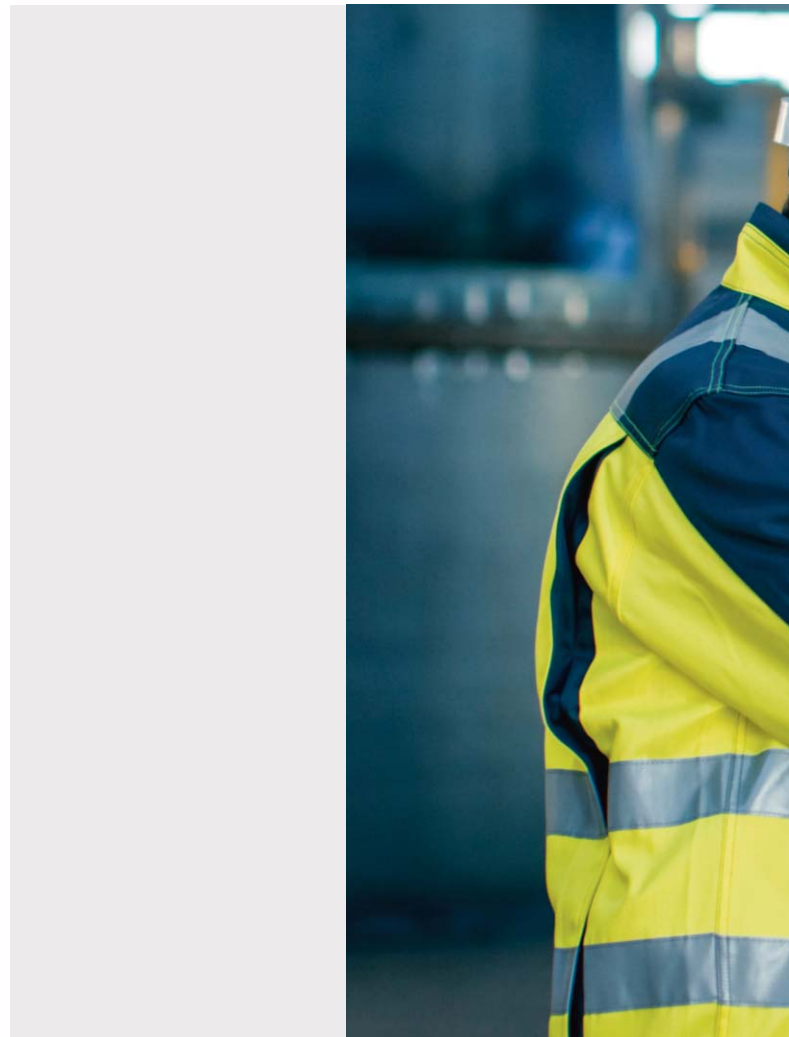
collaboration is essential to bring together the breadth of parties involved in enabling sustainable places, accessing their expertise and commitment. Effective collaboration requires strong leadership, with an understanding of objectives and the evidence-base to support decision-making. In creating places it is also likely to require changes in guidance, legislation or regulation to establish the framework for collaboration. It also requires skills and even where collaboration is more consistent, we have seen that those skills are not always available.

It has been recognised that the Place Principle provides an effective model to design places well, however, alongside methodologies such as the Place Standard tool, it needs to be more firmly embedded in practice, rather than remaining voluntary. Where there are barriers to collaboration, these need to be removed. Obstacles include issues such as the challenges of upfront investment by utility companies; and insufficient alignment of objectives within the public sector undermining a more cohesive "one public sector" approach; and barriers to the necessary culture of trust and reciprocity across all parts of the industry, whether public, private or community.

Spatial planning has a role to establish greater market transparency, which is essential to facilitate private sector development, giving the sector confidence on strategic direction. NPF4 is anticipated to help support this aim through increased co-design, facilitating transparency of objectives and opportunities. However as per our Phase 1

recommendations, NPF4 should be clearly based on evidence, with a settlement (including housing), industry and labour & skills assessment of need that reflects a co-ordinated spatial plan, from national to local. Data availability and quality is central to the evidence-base, with a number of opportunities seen which should be harnessed to maximise the efficiency of our place development activities, while addressing current duplication of effort.

NPF4 is however only one tool to improve collaboration and spatial planning. To ensure the planning system works for places also means addressing the use of planning obligations, with related first-mover barriers and sharing of risk.

Finally, the skills needed to build sustainable places are not always in one organisation. Collaboration has a role in supporting cross-organisational sharing of skills, however there are also times where none of the existing partners have the skills needed. A "one public sector" approach should have a role in addressing this challenge, as should looking beyond the public sector.

Collaboration has been emphasised throughout this section on enabling sustainable places. While many of the recommendations to follow are intended for the public sector, for places to function better there is a distinct and valuable role for the different parties: -

> The Public Sector needs to establish the framework to stimulate culture change, through guidance, legislation or regulation, making collaboration the norm. This includes embracing an inclusive net zero carbon economy whereby alongside a deprioritising of traditional economic measures, lowest cost is not the driving force. It also requires market transparency, where plans and strategies are vertically linked without ambiguity; and embracing a model of reciprocity, both public and private. Finally, it requires greater harnessing of the available skills in communities and communities of interest, including the private and third sectors.

> The Private Sector is a key part of this new method of collaboration, with skills to support the objectives of an inclusive net zero carbon economy. This includes recognising their priorities need to be considered alongside those of other stakeholders, if places are to be more effective. That may mean preferred sites, whether on the basis of technical or financial preference, are not always the best for places long-term and collaborating to identify the best sites for all stakeholders should be the new norm. It also means making their skills and resources available to better design and develop our places, reflecting partner priorities.

> Communities and their anchor institutions are at the heart of our places. A new social contract where communities are driving priorities also means a recognition of limited resources and competing objectives. As with all parts of the system, this requires reciprocity and a strategic understanding of locations, collaborating as an equal partner with equal accountability.

Section **Two**
Enabling Sustainable Places (continued)

Recommendation

On this basis it is recommended that:

SYSTEMS & BEHAVIOURS

3. Scottish Government should enshrine the use of the Place Principle within planning practice, by end of 2021, through guidance, legislation or regulation as appropriate.

4. Building on Phase 1 needs-based recommendations, in the development of National Planning Framework 4, Scottish Government should establish a cross-portfolio and robust evidence-based land use appraisal and prioritisation approach by end of 2021, which vertically aligns national, regional and local needs. This involves co-produced industrial, settlement (including housing) and labour & skill strategies for each spatial level, which manage the difficult trade-offs and maximise the potential of an inclusive net zero carbon Scotland. This systematic appraisal and prioritisation approach should:

   > Consider the fullest interpretation of an inclusive net zero carbon economy, including growth which reflects fair work, access to the labour market and equity, including spatial equity[lxv].

   > Support a working agreement on land use priorities, including vacant and derelict land sites; and

   > Facilitate market certainty to unlock significant sites, with coordination and clarity of the funding, financing and delivery of enabling infrastructure; including

   > A cohesive approach to planning obligations, to overcome issues of first-mover risk, transparency around enabling infrastructure and other disincentives to investment.

5. A "one public sector" outcome-based approach should be developed for our places by the end of 2021. This would build on changes within the Planning Scotland Act (2019), establishing a clear duty to co-produce and co-deliver existing and proposed spatial plans and includes the necessary shared accountability measures. How this effectively complements and learns from Community Planning Partnerships, Local Area Improvement Plans, Locality Plans and Local Place Plans should be reviewed, to make as efficient and streamlined as possible, while ensuring collaboration becomes a required practice.

6. Scottish Government should co-ordinate national upfront utility investment via changes to guidance, legislation or regulation, by end of 2021.

ENABLING DIGITAL TECHNOLOGY

7. Recognising the critical and increasing importance of high-quality data to infrastructure assets of all types, Scottish Government should establish a digital data co-ordination, standards and facilitation role, by the end of 2021, to support the efficient and innovative development and use of data for the infrastructure sector.

   > This should include a review of existing data development and management roles to ensure the competency is located and resourced in the most efficient way;

   > The function should support and drive the development of activities such as digital twins, where the sharing of asset data information facilitates better use of existing assets and informs future investments; and

   > Identify skill and training requirements and, with partners, establish an effective strategic response.

8. A centrally held data resource is developed by the end of 2021, to provide open-source data that will inform place need and demand, including effective asset development and use.

RESOURCES

9. Scottish Government in partnership with the private sector, third sector and communities, by the end of 2021, should further develop and harness the essential skills to develop and improve our places. This should include establishing and directly supporting an appropriately experienced and co-ordinated skill resource for the prioritisation, planning and delivery of infrastructure, which is available to all local authority stakeholders, across spatial levels.
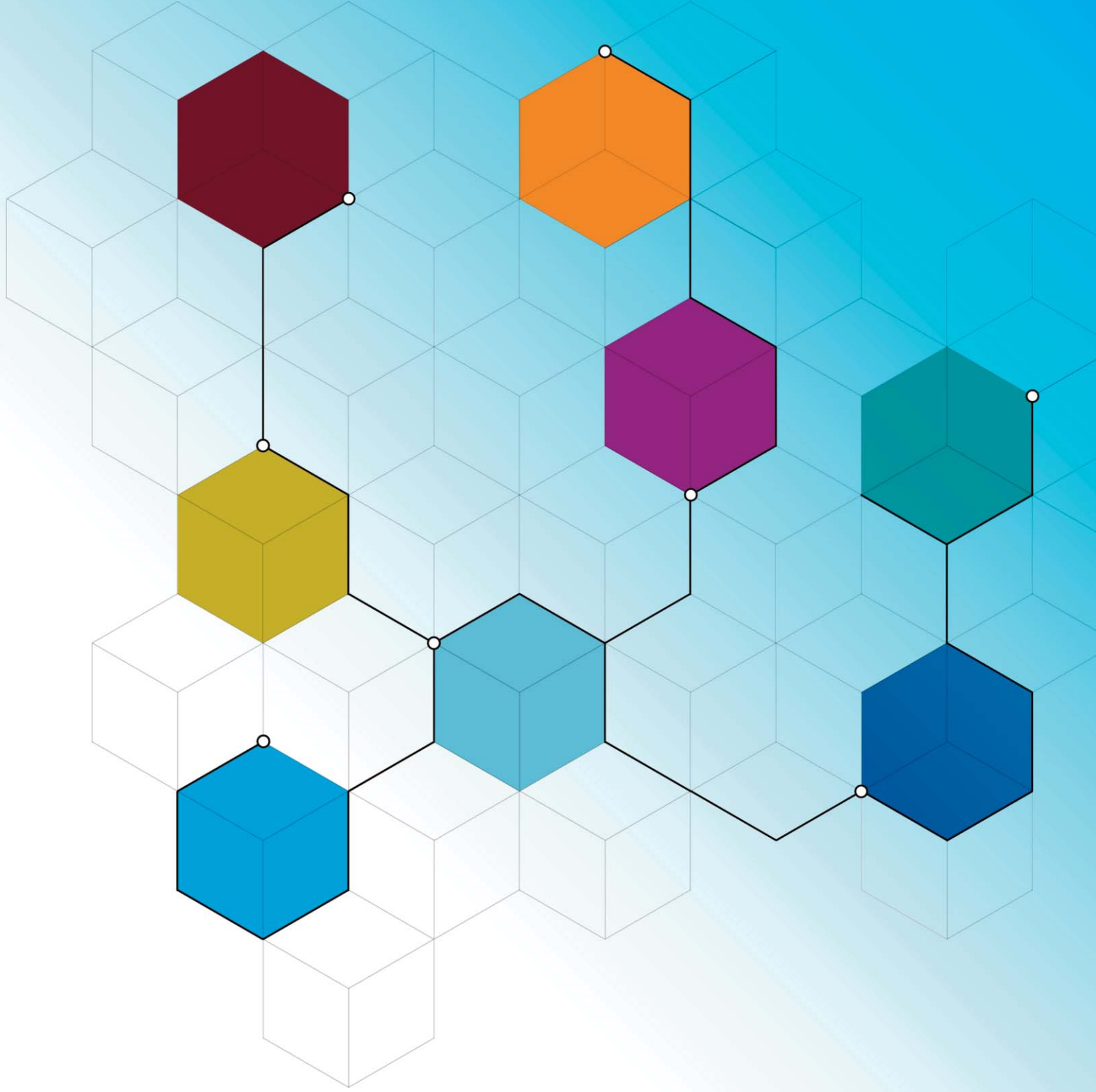
Section 3:
Delivering a Thriving Construction Sector

PHASE 2: DELIVERY FINDINGS REPORT

Section **Three**

# Delivering a Thriving Construction Sector

Introduction

A key element of our Phase 1 Report[lxvi] was the development of a whole system approach to underpin an infrastructure strategy designed to support a sustainable, resilient and inclusive Scotland over the next 30 years. This recognised that the infrastructure we choose to invest in, whether this is to refurbish or repurpose existing infrastructure or for new infrastructure, must contribute to delivering wider outcomes that will benefit Scotland as a whole and not just a series of narrow or specific project based outcomes. Our Key Recommendation 1[lxvii] that *"the Scottish Government should prioritise all new infrastructure investment decisions based on their contribution to the delivery of an inclusive net zero carbon economy"* serves to illustrate the point. Therefore, in the context of a whole system approach, our definition of the "delivery of infrastructure" includes all the stages and processes involved from the germ of an idea to its realisation and subsequent use. How all these stages and processes fit together will have a large influence on how well a project is delivered.

This section will focus on that part or stage of the overall process concerned with how the public sector engages with the construction industry to secure the physical or "hard" delivery of refurbished, repurposed or new assets that clients require. It assumes that the decision on what is required has already been taken earlier in the delivery process, with that decision prioritised on the basis of the project's contribution to inclusive net zero carbon outcomes. We have described it as the "market interface" between client and contractor, with hard delivery outcomes dependent on a combination of many interrelated factors. These include, for example, the respective skills, capacity and capability of both client and contractor – are they right for the particular project; their relationship – is it collaborative or adversarial; and the procurement route chosen – is it appropriate for the particular project and is it being managed correctly. Getting these and other related issues right in order to ensure a smooth, rather than jagged, interface will have a major impact on the successful delivery of a project.

In the context of the delivery lifecycle, the "hard" delivery of projects sits firmly within Stages 2 (Planning & Structuring) and 3 (Construction & Renewal). It is a process of turning the ideas, aspirations and plans for a project or programme of work into reality. In broad terms, the process is the same, irrespective of the nature of the project itself — the client appointing a contractor and supporting advisers/consultants to undertake the work required to refurbish or repurpose existing infrastructure or, where appropriate, construct new infrastructure. The process impacts all of the sectors, though the primary focus here

is on the public sector's engagement with the construction market. It is applicable across the whole of Scotland, with strong governance, particularly collaboration between clients and contractors and good leadership being key. In terms of organisational design, it will impact on most of the dimensions and is about "thinking", designing" and "doing". Finally, a successfully delivered project will have a major impact on achieving or realising the over-arching outcomes — conversely, a poorly delivered project can have a seriously adverse or negative impact.
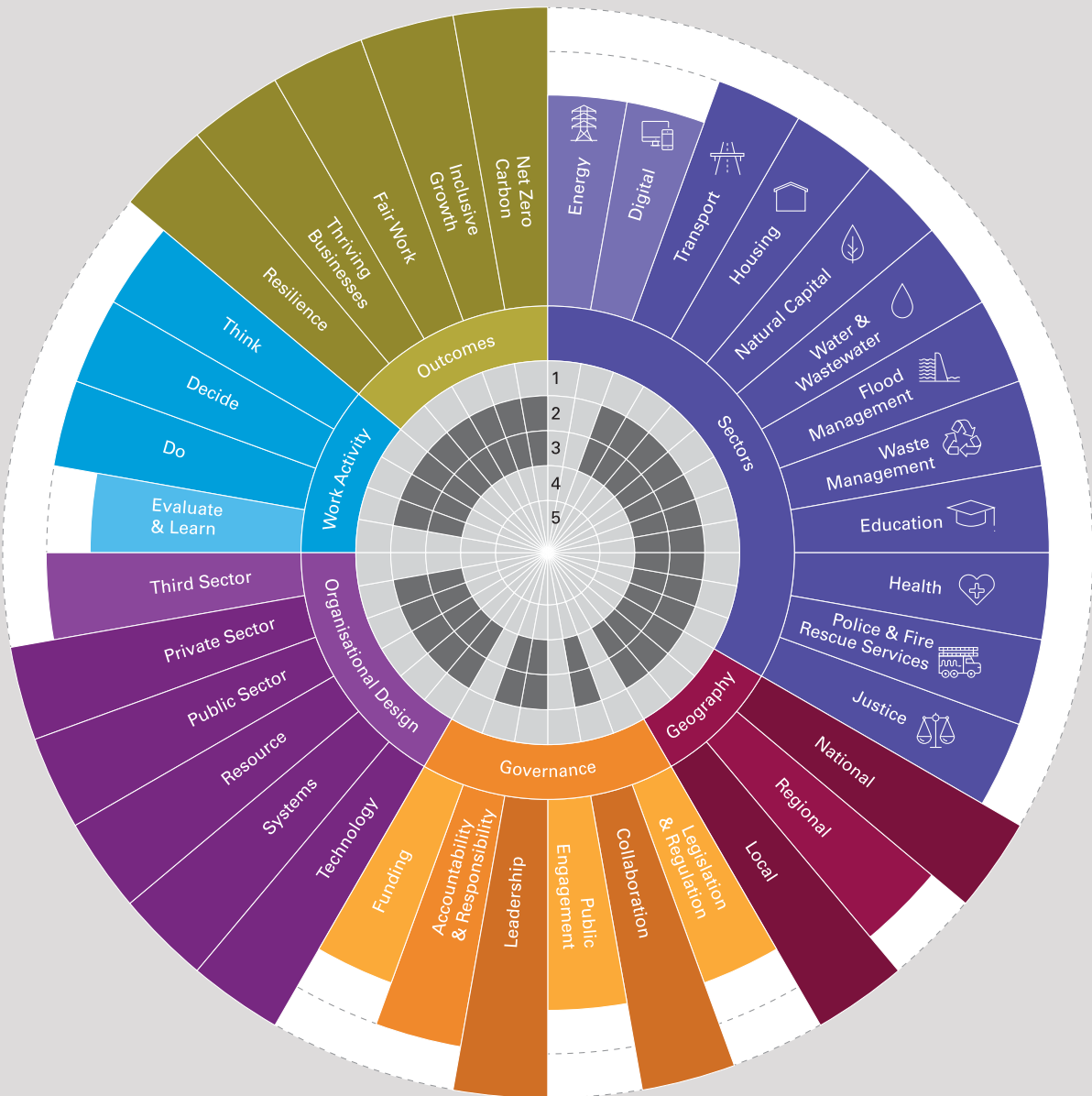
Dimensions

- Sectors
- Geography
- Governance
- Organisational Design
- Work Activity
- Outcomes

Lifecycle Stages 1-5

1. Stage 1 - Strategy & Prioritisation
2. Stage 2 - Planning & Structure
3. Stage 3 - Construction & Renewal
4. Stage 4 - Operational & Maintenance
5. Stage 5 - Decommissioning & Evaluation

Key Focus   Lower/No Focus

Dimension Priority

- Level 3 - Very Important
- Level 2 - Important
- Level 1 - Less Important

Background

Historically, the relationship between clients and contractors for construction and civil engineering works has been transactional – the client has an infrastructure "need" and employs a contractor to "build" what is required. This works, up to a point – projects are completed but can often be over budget, delivered late and sometimes of poor quality.

The Institution of Civil Engineers (ICE) is a strong advocate of change[lxviii] in this area and makes a compelling case that "the model we use to deliver and operate much of our infrastructure is broken. Too often it produces assets and networks that are expensive, perform poorly and fail to exploit the advances in technology that are transforming other industries. Too often the supply chain that delivers our infrastructure seems locked into a cycle of low margins, low investment and dysfunctional relationships". The ICE has recommended moving away from transactional, cost driven procurement of individual assets, through the creation of value driven, collaborative teams that can deliver investment programmes that secure the outcomes demanded by clients and the public. Indeed, the importance of greater collaboration between the various parties in the delivery of our infrastructure is not limited to just the construction stage; as noted in the previous section on Enabling Sustainable Places, stronger collaboration between the public and private sectors is expected to play a key part in supporting the objectives of an inclusive net-zero carbon economy.

It is clear from our discussions with stakeholders that many would agree with the ICE's broad analysis and conclusions. Indeed, these issues are not new and over the past few years there have been various initiatives to address many of them. For example, the Scottish Government's Review of Public Sector Procurement in Construction (Oct 2013)[lxix], Construction Scotland's Construction Industry Strategy 2019-2022 (Nov 2018)[lxx] and the creation of the Scottish Government/Construction Scotland Leadership Forum (Dec 2018)[lxxi].

As a consequence, work is progressing on a number of fronts to address some of these issues. These include, for example, improving the delivery and construction quality in the built environment, reforming of the underlying factors that encourage unsustainable pricing and developing suitable frameworks which not only allow clients to invite tenders for construction or civil engineering works on a call-off basis over a period of time, but are also designed to encourage Scottish business. While this to be welcomed, progress in implementing certain aspects can, at times, appear slow. However, the Scottish Government's National Infrastructure Mission, which has signalled a step change in the levels of investment in Scotland's infrastructure, coupled with the recommendations in our Phase 1 Report, on Scotland's infrastructure

requirements in order to tackle the dual challenges of a climate emergency and the desire to create an inclusive growth economy, provide an opportunity for the public and construction sectors to reset their relationship.

To help inform our conclusions and recommendations around the development of an effective construction market interface for Scotland, we have engaged with and received evidence from a wide range stakeholders. This is summarised at Appendix J.

Issues and Considerations

Importance of the construction sector to Scotland's economy

> **Scale and outlook**

In February 2020, immediately prior to the impact of the Covid-19 pandemic, Scottish Enterprise reported[lxxii] that the construction sector in Scotland comprised some 21,000 companies (12% of all companies in Scotland) employing around 150,000 people (6% of Scotland's total employment) and is worth in the region of £8bn GVA to Scotland's economy (about 6% of Scotland's total GVA). Scottish Enterprise also reported that of those construction companies it surveyed during the 6 month period from July to December 2019, 59% were reporting increased turnover and 26% improved profitability. Looking ahead to the first half of 2020, 39% were expecting to grow their workforces.

While this snap-shot of economic activity might suggest a reasonably healthy situation, the construction sector is nevertheless highly susceptible to market volatility. A report in 2019 by the Chartered Institute of Building (CIOB) on the value of construction in Scotland[lxxiii] noted that *"volatility in the wider economy is amplified in construction with damaging effects"* and called for measures to help moderate these effects. This included the creation of a schedule of prioritised longer-term projects supported by more flexible funding arrangements to help smooth out cyclic peaks and troughs. The CIOB contend this would not only benefit the wider Scottish economy, through the greater retention of jobs in the sector but *"support effectiveness, confidence and innovation in the construction sector"* thus creating more opportunities and enabling a more collaborative approach at the market interface.

However, the reasonably positive and buoyant outlook of just a few months ago has been rapidly overtaken as a consequence of the economic shock caused by the Covid-19 pandemic. In April 2020, the Fraser of Allander Institute estimated[lxxiv] a contraction of construction activity by as much as 40 -50% if the pandemic lockdown restrictions were to continue over a 3 month period. During this time, the

Government and the construction sector have been working closely to develop a post Covid-19 restart plan in response to this sharp and sudden decline in activity. This has been necessary in order to secure the immediate future of sector and may prove to be a catalyst for the development of a stronger and more collaborative working relationship between public sector clients and the construction sector going forward.

> **Skills and diversity**

As indicated in our Phase 1 Report, Scotland faces major infrastructure challenges in order to deliver or secure an inclusive net zero carbon economy by 2050. A key factor in meeting these ambitions will be our ability to ensure a Scottish construction sector with the capability and capacity to undertake the work that is going to be required over the next 30 years or so. However, it would appear that a potential skills gap is emerging in Scotland. The Construction Industry Training Board[lxxv] (CITB) reports a sharp fall in the number of college leavers entering the construction sector and its Construction Skills Report for Scotland 2019-

2023[lxxvi] indicates that the industry needs to recruit around 14,000 new workers by 2023, yet employment growth in the sector is just 0.3% compared to 2.6% in the rest of the United Kingdom.

It is also anticipated, going forward, that considerable upskilling will be required in order to prepare a workforce with the right skills for a modern construction sector. For example, our Phase 1 Report is clear that in order to address the challenges of delivering an inclusive net-zero carbon economy, we need to re-think what infrastructure we use and how we use it. However, this is not limited to strategic issues, but will impact on all who plan, build, invest in, own, operate, regulate and use Scotland's infrastructure. Our recommendations demonstrate that many significant changes will be required in the way we deliver our infrastructure. These include, the need for stronger long term planning, more intelligent capture and use of data, more collaborative working, greater use of digital technologies and innovation, delivering lower carbon levels and creating workable circular economies. To deliver these recommendations we need to upskill and create new skills training in response to the challenges to be faced. Moreover, it is also likely there will be opportunities to bring new people into the sector whose skills have not always been seen as necessary or applicable to the construction industry.

We also need greater levels of diversity – Equate Scotland[lxxvii] report that women make up just 15% of the UK construction sector's workforce, with just 2% of manual trade workers (see case study). Recruiting more women into the sector is seen by many employers as central to filling an emerging skills gap, but are unsure how best to do this. Equate Scotland's new "Inclusive Value Tool" is designed to provide the kind of help and guidance that might be needed.

However, we have heard concerns from some stakeholders that the organisation of training in construction skills in Scotland is too fragmented with many players involved (for example, the professional institutions, CITB, Skills Development Scotland, BSE Skills and the Scottish colleges and higher education institutions) and would benefit from a more coherent strategic approach and resultant funding streams in order to ensure a sharper focus on meeting the needs of the construction sector. We have also been informed that the registration of apprenticeships is not a requirement in all areas of the industry which makes it difficult to monitor numbers and competency accurately within the sector. It is argued that an appropriate form of registration for apprentices will raise the profile of construction careers as well as helping to promote and support the delivery of quality in the sector.

It is also clear that any "upskilling" required is not limited to only "on-site" skills – there is a need to improve capacity and capability on the client side. The delivery of construction works is a complex process with client expertise and experience being important factors in securing a successful outcome. While some of Scotland's larger public bodies may
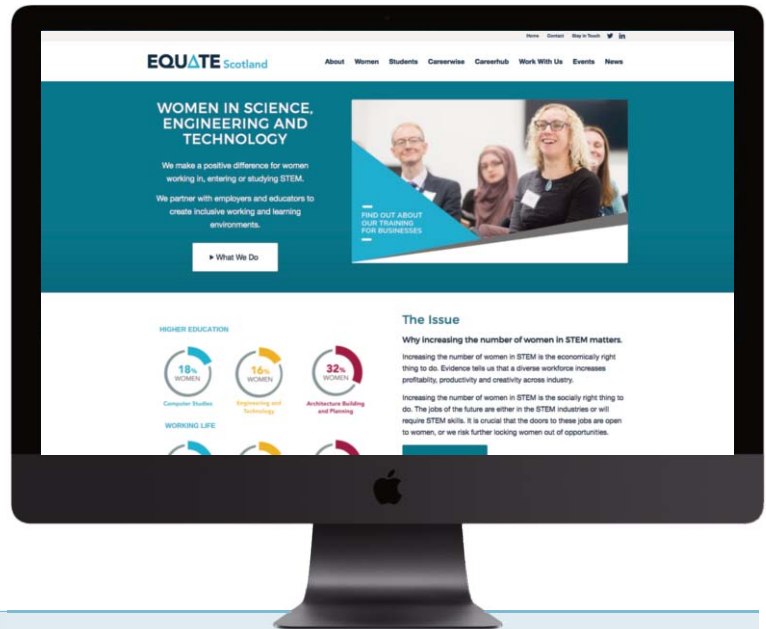
CASE STUDY:

Equate Scotland News Release October 2019

reproduced with permission from Equate Scotland

Established in 2006, Equate Scotland is the national expert in gender equality throughout the STEM sectors and is funded by the Scottish Government to deliver its work without charge to students and women.

"WORK WITH US TO TRANSFORM CONSTRUCTION"

Equate Scotland is working in partnership with City of Glasgow College, CSIC and Sir Robert McAlpine to deliver an online tool that will assist employers in the UK construction sector work towards creating a more inclusive and diverse workplace culture.

Currently women make up 15% of the UK construction sector and only 2% of manual trade workers despite making up 50% of the population. According to the trade union, GMB, it will take over 200 years to achieve gender equality in the construction sector. If we are to meet complex infrastructure challenges related to climate change, population growth and technological transformation, the sector needs to take steps towards recruiting, training and retaining a diverse workforce, particularly at a time when we are experiencing a growing skills gap, aging workforce and uncertainty around Brexit.

Construction employers tell us time and time again that recruiting and retaining women in the sector is central to addressing the growing skill shortage but they are unsure of what actions to take to address the gender imbalance. The Inclusive Value tool is designed to provide employers and training providers with guidance on what changes they can make to create a more inclusive, diverse and ultimately happier workplace, based upon feedback from their employees.

The tool works by asking an employer representative, such as a senior manager or HR professional, a set of questions relating to *Policy and Working Practices*, *Talent Attraction and Retention, Pay and Reward* and *Workplace Culture*. Once answered by the employer a series of similar questions will be generated for employees to answer. The tool will compare and contrast the answers and provide feedback based upon the information collected.

The Fair Work Convention has been in place since April 2015 and acts as an independent advisory body to Scottish Ministers. The Convention's vision is that, by 2025, people in Scotland will have a world-leading working life where fair work drives success, wellbeing and prosperity for individuals, businesses, organisations and society.

have appropriate levels of capacity and capability, not all organisations are as well resourced. Many public bodies in Scotland are small and only procure construction works on an occasional basis. However, the adoption of joint working practices or an aggregated approach across a number of public bodies might enable capacity and capability to be achieved through the sharing of resources. The issue of joint working practices is an area where significant evidence was also gathered in our work related to Enabling Sustainable Places.

> **Fair Work**

In its Economic Action Plan[lxxviii], the Scottish Government indicates it is committed to promoting "Fair Work" which it sees is an important contributor to the delivery of strong, more sustainable and inclusive growth. Scotland's Fair Work Convention sets out a vision[lxxix] that by 2025, people in Scotland will have a world leading working life where Fair Work drives success, wellbeing and prosperity for individuals, businesses, organisations and for society. The Convention is currently undertaking an inquiry into the construction sector and its findings should be helpful in supporting the sector in achieving its Fair Work objectives.

The Commission notes that the Scottish Government indicates in its Fair Work Action Plan that it will work with Scottish Futures Trust and industry partners to develop a Fair Work Charter for the construction sector aligned with the dimensions of the Convention's Fair Work Framework which builds on progress already achieved in this area by contractors and sub-contractors. However, we note this work is still at a preliminary stage and would hope that it can be progressed in conjunction with industry and concluded at the earliest opportunity, through building on action already being taken by contractors and sub-contractors.

The wider implications of how a project is delivered

In advocating a whole system approach to the delivery of Scotland's infrastructure, our Phase 1 Report made clear that investment decisions need to be prioritised by the contribution projects make to achieving wider national outcomes. As the "hard" delivery of a project is an element of the whole system, these principles should also apply at that stage. However, that is not always the case with the focus predominantly on managing project delivery to secure completion on time, to specification and to budget. While this is of fundamental importance from a project management perspective and is a significant measure of success, it is not the only measure. A recent report for the New Zealand Infrastructure Commission[lxxx] makes the compelling case that how a project is delivered can have "substantial implications on the local community, workforce wellbeing, our construction sector, the environment and many other facets of New Zealand life". The report goes on to contend that a failure to consider properly these wider outcomes could have a significant adverse impact on the construction sector and New Zealand society as a whole through restricting the country's ability to ensure the effective delivery of its future pipeline of projects. It concludes that a shift in thinking that focusses on how project costs and benefits can be assessed at a cross government rather than simply at a project level will help to secure the advancement of government priorities and objectives as well as enhancing the capability of New Zealand's construction sector.

One way in which this can be supported is through clients signalling a greater level of certainty going forward by developing more useful and transparent pipelines of investment. This is not simply a listing and timeline of expected projects but a dynamic pipeline that offers longevity and certainty and allows for the lessons learned and skills acquired during the delivery of previous projects to be utilised to enhance the delivery of subsequent projects.

There are already some examples of good practice that have been developed during the delivery of a number of recent national scale programmes. These include Scotland's Hub Programme[lxxxi], which has delivered or is delivering a portfolio of infrastructure projects for its Scottish public sector partners valued at nearly £3.8bn, supporting some 3,700 jobs with 80% of hub contracts awarded to Scottish SMEs; and Scottish Water's Capital Investment Programme[lxxxii] which has a rolling 6 year delivery programme working towards a 25 year horizon. This approach has enabled Scottish Water to establish strong relationships with its strategic delivery partners which is supported by a wider supply chain that has improved capacity and capability to deliver its capital programme while at the same time helping to strengthen the economy by working with local businesses.

Modern methods of construction

Our Phase 1 Report identified that a key challenge is how Scotland can meet its future housing needs. For example, in 2019 Homes for Scotland estimated that 25,000 new homes will be needed each year to keep up with predicted demand[lxxxiii]. In parallel, New Civil Engineer (NCE) reported[lxxxiv] that *"a modular home revolution is on its way"* though noted that a significant change in attitude will be required if this revolution is to succeed. NCE argues there are clear and extensive benefits in such an approach, which can deliver cheaper, high performing homes with consistent quality and embedded smart technology. Moreover, houses can be built up to 50% faster and more safely due to their prefabrication in a controlled factory environment.

However, some commentators believe the UK construction sector has been slow to respond to the market opportunities this presents and is failing to adapt to new technologies or move away from traditional construction methods[lxxxv]. Progress in the area of modular building has been faster and more extensive in Europe, with skills and expertise maturing quickly, whereas modular building in Scotland is still in its early stages of development.

In spite of this there have been some encouraging developments; in order to inform future policy in this area, the Scottish Government, Scottish Enterprise and the Construction Scotland Innovation Centre (CSIC) commissioned research into increasing offsite housing construction in Scotland. The report of this research was published in January 2020[lxxxvi] and confirmed many of the benefits described above. However, it also identified a number of barriers, including:

> A preference for agencies in the housing supply chain to use traditional construction methods;

> The costs of modern methods of construction and the tendency for offsite manufacture and assembly systems are dependent on economies of scale; and

> A different, more technically enhanced and digitally enabled set of skills is needed in order for all stakeholder involved in the supply chain to be competent in managing the manufacture and assembly of affordable modular housing.

To help develop a new business model to support offsite construction in affordable housing, the City of Edinburgh Council is working with a number of partners on a collaborative project – the Edinburgh Home Demonstrator – established to test the effectiveness of the approach on an initial tranche of 1000 homes. These will be designed and constructed, as far as is feasible, to meet net-zero carbon standards. A key objective of the project is to unlock opportunities for innovation in housing construction and will focus, in particular, on the development and application of the new business model, the collaboration and

relationships between the project partners and the benefits of standardisation. It is expected that construction will commence in mid-2021 with the first homes ready for occupation in early 2022, subject to any consequences of the Covid-19 pandemic.

A more collaborative approach

As noted above, the ICE is a strong advocate of moving away from the traditional transactional relationship between client and contractor for the delivery of infrastructure projects, to one where delivery is underpinned by a collaborative shared enterprise between the parties. The disadvantages with the transactional approach have been well documented and widely understood and although some progress has been made in certain areas, it is not universal. For example, many public sector clients still seem focussed on awarding tenders based on cost alone rather than securing best value. However, such an approach may be counterproductive as it can lead contractors to price at unrealistically low levels. Construction of new infrastructure (along with the refurbishment and reprioritising of existing infrastructure) is an inherently high risk process which can be difficult, if not impossible, to manage effectively if operating margins are too low. In 2019, The Institute of Chartered Accountants in England & Wales (ICAEW) warned[lxxxvii] that lowest price tendering drives contractors to price their work at unrealistic and unsustainable levels which, in the longer term, may have an adverse effect on the construction industry. The ICAEW predict that this practice could not only result in many construction companies failing but will also have a knock-on effect on supply chains and subcontractors. Again, similar issues were raised in our work around Enabling Sustainable Places.

This is not a new issue - for example, the Scottish Government is clear that procurement for construction works should be conducted on the basis of value for money and not lowest price alone; indeed, this is a legal requirement for all procurement above a certain threshold[lxxxviii]. However, the construction industry contends[lxxxix] that a perception continues to exist in the Scottish public sector that accepting the lowest price in a construction procurement competition represents best value for the economy.

However, the Commission recognises that these are complex issues to resolve and there is no single, easy answer. In 2018, the Scottish Government and Construction Scotland established a Leadership Group with the overarching purpose of developing a shared action plan between the Scottish Government and the construction sector which enables the government to deliver on its economic, procurement and quality aims; and, helps the construction sector to achieve its aims as set out in the Construction Scotland Industry Strategy for 2019/2022. The Group's initial focus has been on issues around the quality of construction, eliminating

Refurbished Marr
College, Troon

unsustainable pricing and the development of Scottish procurement frameworks. While a number of other frameworks already exist, the potential benefit of bespoke Scottish Frameworks was that they could be established to support the Government's policy aim of securing sustainable and inclusive economic growth. Additionally, there was a shared sense that Scottish frameworks would provide the opportunity to implement and demonstrate the collective work of both government and the construction sector in relation to quality, sustainable pricing and the evolving net zero carbon priorities.

These are helpful steps in the right direction — but could more be achieved? And, how can we view infrastructure as not only an enabler of economic growth, but as a catalyst for delivering social, economic, and environmental benefits? It is also important to recognise that given Scotland's diverse geography, different areas of the country have differing needs and requirements. For example, the infrastructure needs for the central belt and the way they are delivered are very different from what is required on the Scottish Islands — there is no one size fits all solution.

The approach being adopted by New Zealand in response to similar issues is both interesting and informative. As a country it shares many of the challenges we face in Scotland - it needs more affordable housing, safer and greener buildings and new and upgraded infrastructure. It has a long-term infrastructure plan, but its construction sector is facing significant challenges that could compromise New Zealand's ability to deliver the intended outcomes. These include a skills and labour shortage, poor risk management, unclear regulations and construction pipeline and fragmented, uncoordinated leadership. In response, the New Zealand Government has developed an Accord with the construction sector to help drive through the transformational change required[XC]. The Accord requires both government and the construction sector to work together to create and support a more productive, innovative and safer industry.

In the autumn of 2018, the New Zealand Government and industry recognised that a new approach in their relationship was required in order to ensure a thriving construction sector able to contribute to the county's social and economic wellbeing. Both sides moved with pace to develop and agree the "The Construction Sector Accord" which was launched in April 2019 by the Prime Minister, 7 Accord Ministers representing a broad range of portfolios and 13 sector leaders from across industry and government.

Its implementation is overseen by a Leadership Group, chaired jointly by a government Minister and the CEO of one of New Zealand's leading construction companies, underpinned by a dedicated specialist support team. The Accord has created a platform for industry and government to work together to meet some of the key challenges facing the sector including skills and labour shortages, unclear regulations, a lack of coordinated leadership, an uncertain pipeline of work and a culture of shifting risk. At the heart of this approach is a shared recognition that the construction sector is an ecosystem that depends on the high performance of all its many parts. The Accord is designed to bring everyone together to support the collective cause.

In January 2020, government and industry leaders in New Zealand launched the Construction Sector Transformation Plan containing 22 programmes within six workstreams to be implemented over three years.

It is suggested that something similar might be appropriate for Scotland. Our Phase 1 Report recognised that significant investment will be required in Scotland's infrastructure - whether new, refurbished or repurposed — over the next 30 years to secure the delivery of an inclusive net-zero carbon economy. A more collaborative and less adversarial approach between client and contractor to secure this delivery, which has been designed for the mutual benefit of all parties and applied consistently across all of Scotland could lead to a more efficient and effective use of public resources, a more sustainable and local supply chain, a better quality product and the development of a highly skilled "local" workforces, all of which can contribute towards the delivery of an inclusive net-zero carbon economy for Scotland.
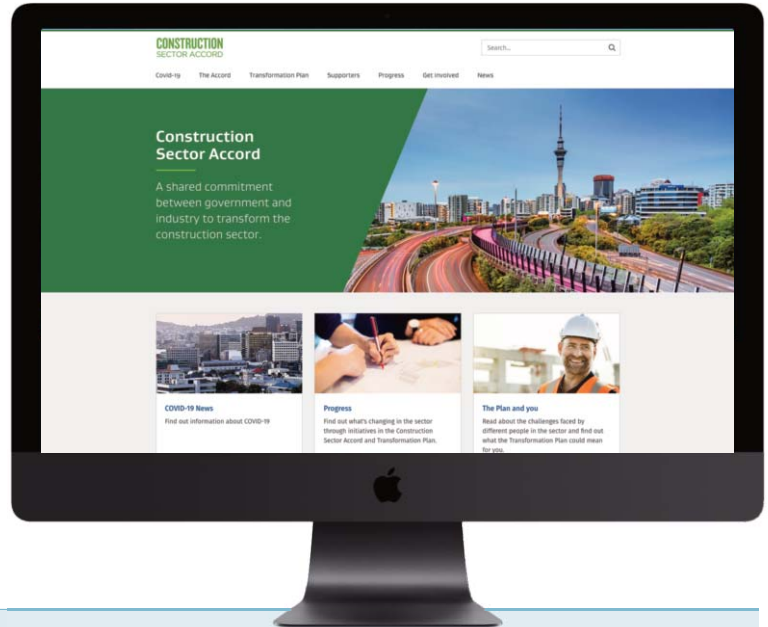
CASE STUDY:

NZ Construction Sector Accord - April 2019

A shared commitment between government
and industry to transform the construction sector

VISION:

A high performing construction
sector for a better NZ built around
4 shared goals:

> Increased Productivity;

> Raising Capability;

> Increased Resilience;

> Restoring confidence,
  pride & reputation

OUTCOMES FOR NZ:

Safe, healthy and durable homes, buildings and infrastructure

That support the wellbeing of our communities.

Workforce

Safe, secure, rewarding careers.

Industry customers

Functioning competitive market.

Industry

Sustainable, resilient, successful businesses.

Government

A construction sector that supports the wellbeing of all New Zealanders.

Guiding principles

Build trusting relationships. Be bold. Value our people. Act with collective responsibility.

PRIORITY WORK AREAS:

Industry-led

Enhanced industry leadership, collaboration and organisation; Better business performance: Improved culture and reputation.

Shared

Grow workforce capability and capacity: Better risk management and fairer risk allocation; Improved health and safety at work; More houses and better durability.

Government-led

Better procurement practices and improved pipeline management; Improved building regulatory systems and consenting processes.

▼

Raining's Stairs Social Housing
Development, Inverness

Conclusions and recommendations

Our Phase 1 Report made a number of recommendations relating to Scotland's infrastructure requirements over the next 30 years in order to deliver an inclusive net-zero carbon economy. To achieve this, significant investment in our infrastructure will be required and major programmes of work developed and delivered. If this is to be delivered successfully, we need to ensure we have an effective, modern and fair market interface process in place that works for the mutual benefit of both client and contractor.

There is, of course, work already underway to develop a market interface process to drive positive outcomes that will increase productivity, raise capability, improve resilience, restore public and political confidence in public sector construction procurement and increase the reputation of the construction sector. This includes, for example, wider implementation of framework contracts, ensuring less focus on lowest cost bids by eliminating unsustainable pricing, developing and implementing more collaborative approaches between client and contractor and encouraging the use of local workforces, subcontractors and suppliers. While this provides a strong foundation to build on going forward, we have concluded that further work is required and there is a window of opportunity for the public and construction sectors to reset and strengthen their future relationship in order to prepare for the delivery challenges we face over the next 30 years, including the successful delivery of the National Infrastructure Mission.

Therefore, from the work undertaken for both Phases of our remit, we have concluded the following:

> There is a need to ensure that investment and delivery decisions about specific projects are not focused only on narrow project outcomes but on the delivery of wider national outcomes, notably delivering an inclusive net-zero carbon economy;

> At key decision-making stages of the delivery process, it is important to ensure the focus is not just on what is to be delivered but on how it is delivered. For example, how projects are delivered has an impact on the local community, economy, workforce, construction sector and the environment;

> There is a widening skills gap at all levels which needs to be considered. There is also a need to increase diversity in the workforce and to consider future skills requirements;

> In response to the challenges of a widening skills gap and increasing diversity in the workforce, there is a need to develop a more coherent and less fragmented approach to skills development and training in Scotland which is more sharply focussed on the needs of the construction sector – both in the immediate and longer terms.

> By building on good practice established during the delivery of a number of recent national scale programmes, we need to develop more "useful" and transparent forecast pipelines of investment. These should not be a simple listing and timeline of expected projects, but a dynamic pipeline that demonstrates longevity and reasonable degree of certainty and also allows for lessons learned and skills acquired and developed during previous projects to be utilised to enhance the delivery of subsequent projects;

Section **Three**
Delivering a Thriving Construction Sector (continued)

> Ensure the market interface is used to drive positive outcomes that will increase productivity, raise capability, improve resilience, restore public and political confidence in public sector construction procurement and increase the reputation of the construction sector. For example, through the wide implementation of framework contracts, less focus on awarding to lowest cost bids by eliminating unsustainable pricing, developing and implementing more collaborative procurement approaches between client and contractor and encouraging the greater use of subcontractors and suppliers;

> To underpin the above, there is a need to develop and implement a robust, transparent, workable and inclusive "Construction Accord" between the public and construction sectors built around the principles above to improve the overall health and performance of the construction industry and enable an improvement in the delivery of better quality buildings and places.
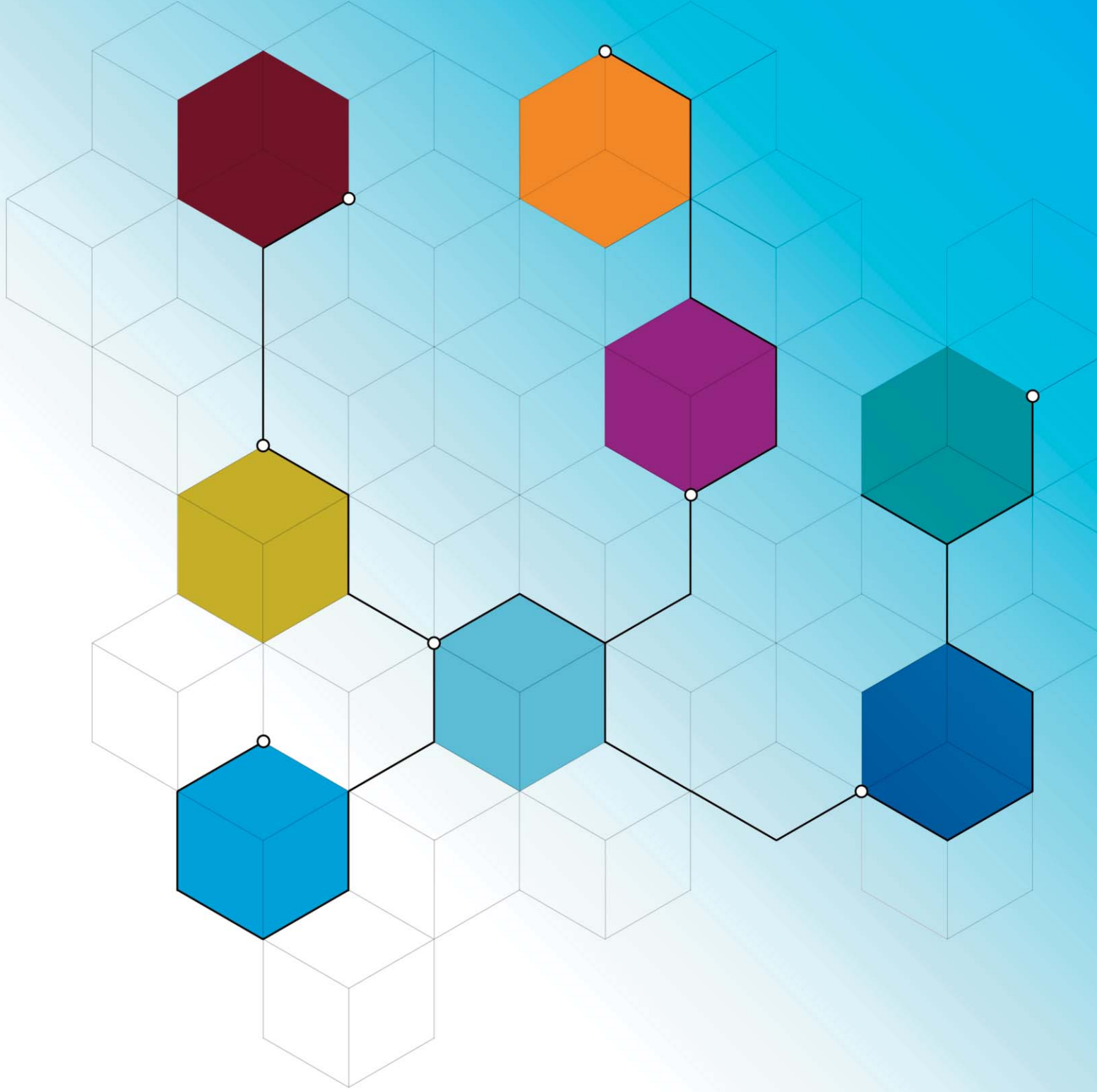

Recommendation

On this basis, it is recommended that:

10. By building on its work to date, the Scottish Government and Construction Scotland Leadership Group should, by Quarter 1 2021, jointly lead, develop, resource and implement a "Construction Accord" between all Scottish public bodies and the whole of the construction sector. Its purpose is to set out an inclusive, shared vision for and commitment to create the market interface conditions to support a high performing construction sector for the benefit of all Scotland, that contributes to the achievement of an inclusive net-zero carbon economy and underpins the delivery of the National Infrastructure Mission.

11. This should include measures:

    > To improve the capacity, capability and diversity of the workforce (at all levels) for both client & contractor, including the development of skills relevant to modern methods of construction and the application of new technologies;

    > To develop a more coherent and less fragmented approach to skills development and training in Scotland which is more sharply focussed on the needs of the construction sector – both in the immediate and longer terms;

    > To monitor numbers and competency within the industry, consideration should be given to the development of an appropriate registration scheme for all apprenticeships in Scotland which will also raise the profile of construction careers as well as helping to promote and support the delivery of quality in the sector;

    > To ensure those working in the construction sector are employed under the principles and conditions of Fair Work in order that they enjoy safe, secure and rewarding careers;

    > To enable the development of improved programme pipeline forecasting and management that demonstrate longevity and a reasonable degree of certainty and that allow the experience gained on previous projects to be utilised to enhance the delivery of subsequent projects;

    > That will enable a move away from transactional, cost driven procurement of individual assets, through the development and introduction of value driven, collaborative procurement methods (appropriate for Scottish needs) that can deliver investment programmes designed to secure national outcomes.

Section 4:
Scottish National Infrastructure Company

PHASE 2: DELIVERY FINDINGS REPORT

Section **Four**

Scottish National Infrastructure Company

Introduction

The Commission's remit, to provide advice to Ministers on the delivery of infrastructure, is to include consideration of the possible creation of a Scottish National Infrastructure Company ("SNIC").

Over the past few years, there has been a growing debate around the merits or otherwise of the private finance model for the funding of public infrastructure projects. There have been calls from organisations such as Common Weal, the STUC and a number of academics[xci] for a publicly owned construction company. The concept appears to be that such a company (commonly referred to as a SNIC) working in alongside the Scottish National Investment Bank (SNIB) would construct sustainably financed, locally procured infrastructure that would remain in public hands. Therefore, the Commission has taken this definition of a SNIC and its role and purpose as its starting point in addressing its remit.

It is, however, worth noting that the recent report of the Scottish Parliament's Economy, Energy and Fair Work Committee's inquiry into construction sector ("Under construction – Building the future of the sector in Scotland (July 2019)) makes no reference to the concept of a SNIC in its 39 conclusions and recommendations. The Committee notes *"it has taken a whole-sector approach, [in looking at] at how these challenges could be addressed for the sector to realise its potential contribution to a productive and inclusive economy"*.

Throughout our work, we have been consistent in our approach to meeting our remit by endeavouring to find the best and most effective solutions to the problems and issues we have identified, rather than starting with a pre-determined solution. We have, therefore, adopted this approach in fulfilling that part of our remit to consider the possible creation of a SNIC. In applying an evidence based and whole system approach, aligned to the three areas of the infrastructure lifecycle that have formed the focus of our work during Phase 2, we have not sought to investigate any roles or activities on the basis that the creation of a SNIC is a pre-requisite.

Assessment of a SNIC

The benefits of developing a SNIC could be considered in two broad ways:

> To implement new delivery activity for which the required governance structure does not currently exist

> To establish a new single governance structure that would enable existing activities to be organised and delivered in a different way

In assessing a SNIC, it is important to note that the Commission has not assessed all aspects of the Infrastructure lifecycle as described in the Introduction of this document, and therefore any recommendations made in relation to a SNIC need to be considered in that context.

The Commission has, however, considered whether the implementation of any of the recommendations across the three areas of focus in Phase 2 could be significantly improved through the creation of a SNIC. The Commission has concluded that its recommendations from the three areas of focus can be implemented without the necessity to create a SNIC.

Taking each area in turn:

In terms of the **Prioritising an inclusive net zero carbon economy** workstream, the recommendations most relevant to a SNIC is the establishment of long-term independent advice. The core function proposed for the provision of independent long-term advice is considered by the Commission to be an entirely new activity. There are also additional governance considerations relating to the organisational requirements for the delivery of this advice. Firstly, that it be an organisation established independently and at arm's length from government, and secondly that it has a broad base of political support; achieving both of these would enable the advice provided to remain both long-term focused, and to hold the administration of the day to account. From a governance perspective, there are existing organisations that fit broadly with these requirements, although the option remains to establish a new entity. In the event that a new entity was created to such advice, there is a possibility that it could be called a SNIC (as a "Scottish National Infrastructure Commission"), however, it would not be of the scale or nature of that previously suggested for a SNIC. A body of this nature could be similar to those in other countries referred to earlier in the Report.

The **Enabling Sustainable Places** workstream also covered a wide-ranging series of activities with a place focus across multiple infrastructure sectors, multiple public bodies, a broad range of the construction and utilities sectors as well as operating at national, regional and local geographies. The focus of the evidence gathered and the recommendations that have emerged are principally aimed at particular elements of the overall system of developing and planning

for infrastructure at a place level, the role that data and technology can play in implementing those systems, and the need for enhanced resources to support that planning, development and implementation. A number of the recommendations are not considered to be new activities, and are more aimed at streamlining, reforming and enhancing existing activities. Some of the recommendations have highlighted the need for new activities, however in the scope of its work, the commission has not seen evidence that the re-organisation of the public sector into a newly created SNIC is a requirement for the actions identified to be implemented successfully. The recommendations do however demonstrate the need for better co-ordination and alignment of outcomes and delivery across existing organisations as well as the potential benefit of enhancing access to appropriate skills and resources across organisations and spatial geography.

The **Delivering a Thriving Construction Sector** workstream covers a significant range of activities across multiple infrastructure sectors, multiple public bodies, the broad range of the civils, building and housing construction industry as well as operating at national, regional and local geographies. The focus of the evidence gathered and the recommendations that have emerged are principally aimed at improvements to the relationship between the public sector and the construction industry, and how best to develop that relationship through a series of definitive actions. These recommendations are not considered to be new activities per se, and are more aimed at streamlining, reforming and enhancing existing activities. Within the scope of the work that it considered, the Commission did not see evidence to indicate that the re-organisation of the public or private sector into a newly created SNIC would significantly enhance the successful implementation of its recommendations.

Conclusion

As noted above, the Commission's overarching approach has been to ensure its conclusions and recommendations have been developed in response to the emerging problems and issues it has identified or evidence that has been provided to us. In addition, its recommendations are based on an aspiration that the delivery of Scotland's infrastructure is achieved through a coordinated, whole system approach designed to ensure that the public and construction sectors work together in a strong collaborative partnership that can contribute to an inclusive, net-zero carbon economy. The Commission has been consistent in this regard throughout all of its work, including its consideration of the possible creation of a SNIC. Its starting point has been to consider, from the evidence it has received, whether the concept of a SNIC, as envisaged by other parties, would enhance or add value to the outcomes expected by the successful implementation of all the recommendations contained in its Phase 1 and Phase 2 reports.

After careful consideration, the Commission has concluded from its work that none of the outcomes of its recommendations would be enhanced by creation of a Scottish National Infrastructure Company. However, it also recognises that going forward, the situations and the problems we need to respond to are not constant and can change very quickly – the Covid-19 pandemic and its implications on society and the economy serve to illustrate that point. Any future consideration of Scottish National Infrastructure Company will need to draw on the evidence of how successfully the Commission's recommendations have been implemented and their impact, as well as the context prevailing at the time.

Next Steps

With the publication of this Phase 2 Report and submission of further advice to Scottish Ministers, the Infrastructure Commission for Scotland has concluded its work, and we thank the many hundreds of organisations and individuals who have engaged with us, to help inform and guide our work.

We are clear in our view that infrastructure has and will continue to have a crucial role if we are to realise the significant social, economic and environmental benefits of an inclusive net zero carbon economy.

We are also clear that the implementation of all of the recommendations made in both our Phase 1 and Phase 2 Reports - some of which we acknowledge will necessitate a fundamentally different way to prioritise, plan and deliver infrastructure investment - will make a significant contribution to the successful delivery of that inclusive net zero carbon economy. We call on Scottish Minsters to act on and engage widely to address these challenges and opportunities.

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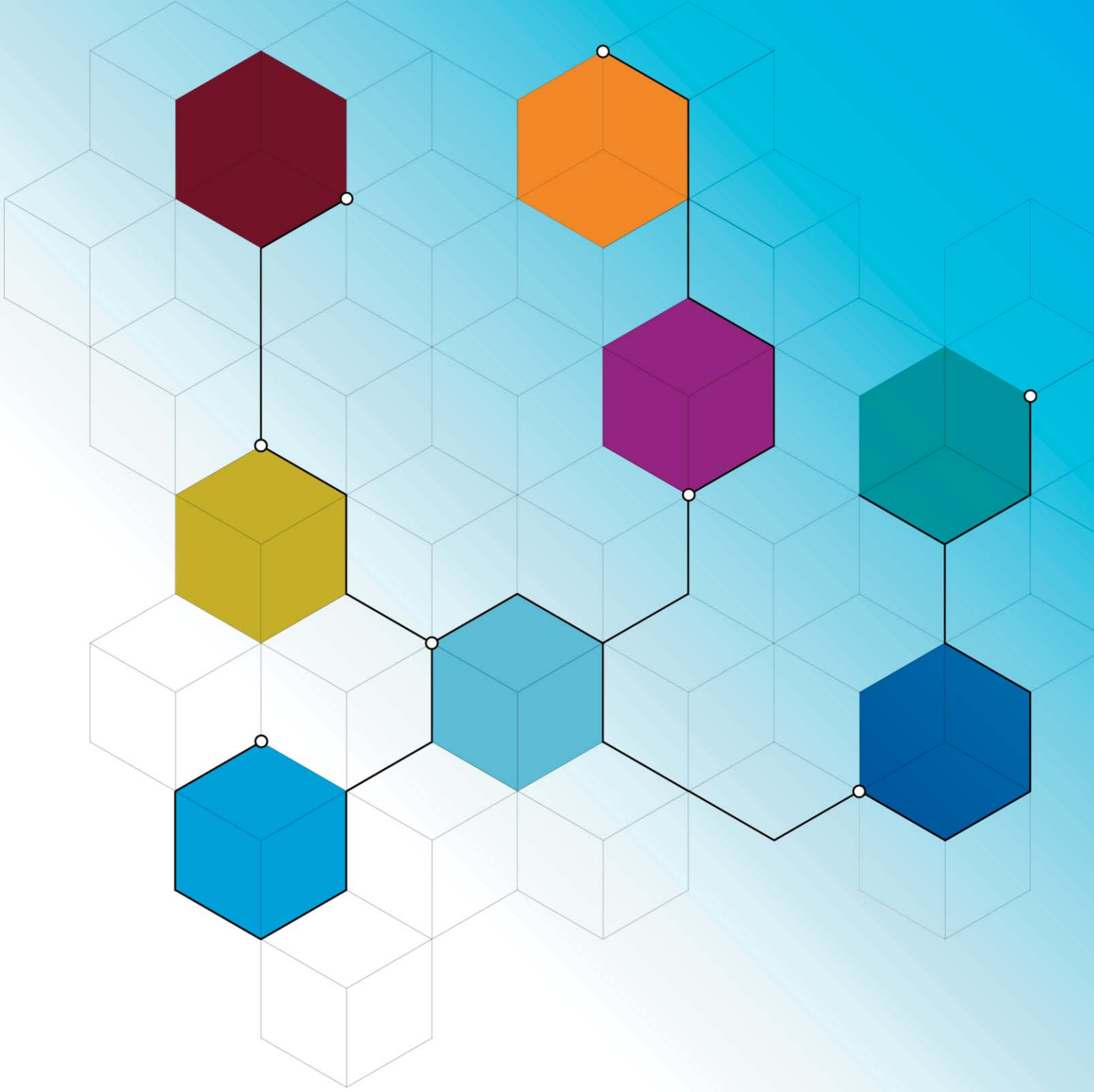
Appendices

Appendix A
Summary of Phase 1 Recommendations

The Infrastructure Commission for Scotland (the Commission) published its Phase 1 Report in January 2020, with an inclusive net zero carbon economy at the core of our 30-year vision for the infrastructure of Scotland. Within the report we made 23 recommendations over 8 key areas of infrastructure:

> Leadership
> Place
> Making the most of existing assets
> Heat and transport
> Regulation
> Digital and technology
> The role of the public
> Independent long-term advice

A summary of the Phase 1 Report recommendations can be accessed below.

Summary of Phase 1 Recommendations

(PDF Document)

Appendix B
Stakeholder Engagement Strategy

The Infrastructure Commission for Scotland (the Commission) recognised from the outset the importance of stakeholder engagement and ensuring that an appropriate strategy was employed to work with each stakeholder group. This ensured that the Commission worked within its remit in a way which was:

> Engaging and widely consultative across all of Scotland and civic society
> Credible, objective and evidence-based
> Outward looking, forward thinking and innovative

The Stakeholder Engagement Strategy was developed to achieve these aims and identified the key stakeholder groups as:

> Representative Bodies
> Public Sector
> Service Users
> Private Sector
> Third Sector
> Political
> Academics.

Following the methodology set down in the strategy the Commission gathered evidence; provided throughout the report and appendices, which enabled a holistic understanding of Scotland's infrastructure needs. This evidence formed the basis for the Commission recommendations within both the Phase 1 and Phase 2 Reports.

The Covid-19 crisis created a unique set of challenges to engagement for the Commission's second phase of work. The Commission are clear that harnessing the knowledge and expertise that stakeholders have is vital to the success of the Commission's work. We therefore conducted engagement by video conferencing in response to these challenges, holding a larger number of smaller engagement sessions to garner a wide spectrum of stakeholder opinions and evidence while following the principles laid out in our Stakeholder Engagement Strategy.

The full Infrastructure Commission for Scotland: Stakeholder Engagement Strategy can be accessed below.

Infrastructure Commission for Scotland: Stakeholder Engagement Strategy
(PDF Document)

Appendix C
List of Stakeholders

From its inception in February 2019 the Infrastructure Commission for Scotland (the Commission) has recognised the importance of wide stakeholder engagement across all of Scotland, in doing so the Commission identified nine key stakeholder groups:

> Users or representative groups
> Businesses or trade organisations
> Private sector providers
> Public sector providers
> Public policy makers
> Legislators/regulators
> Third sector/civic society
> Geography i.e. regional groupings.
> Delivering Infrastructure

To ensure that all groups were appropriately represented the Commission deployed strategies including regional forums, thematic round table events and the initial call for evidence within its Phase 1 work. Beyond these largescale events there was recognition for more detailed one-to-one sessions. These were held to gain a greater understanding of specific sector or industry challenges and to engage with representative from across the political spectrum as an independent commission.

As a result of the Covid-19 crisis the Commission's Phase 2 engagement approach was reviewed, moving stakeholder engagement to video or tele-conferencing and focusing on infrastructure experts with background and understanding of the core strands of the Phase 2 work, building upon the evidence already gathered for the Phase 1 Report. As with the Phase 1 work, Commissioners have engaged across the political spectrum.

Stakeholder organisations are listed, individuals are only named where they have provided a response to our initial call for evidence in their own right.

The list of stakeholders can be accessed in the link below.

List of Stakeholders
(PDF Document)

Appendix C
List of Stakeholders

Appendix D
Infrastructure Commission for Scotland Remit

The Scottish Government charged the Commission with a broad remit, with an infrastructure definition that encompasses "the physical and technical facilities, and fundamental systems necessary for the economy to function and to enable, sustain or enhance societal living conditions." This approach is unique in the inclusion of not only those sectors traditionally considered to support the economy, but also wider social infrastructure, such as hospitals. While this definition was broadly welcomed by all stakeholders, it was also suggested that natural, blue and green, infrastructure should be explicitly included, as assets which support the broadest priorities of economic, social and environmental policies.

Infrastructure Commission for Scotland Remit

(PDF Document)
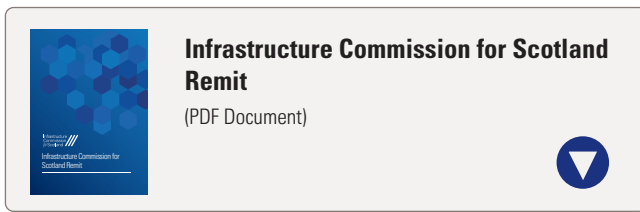
Appendix E
Initial Call for Evidence and Contributions

As part of Infrastructure Commission for Scotland's (the Commission) commitment to broad engagement the initial call for evidence was issued in March 2019. The Commission sought to gather evidence on Scotland's future infrastructure priorities and recognised that a number of organisations and individuals' from across industry, business, the public sector, academia, civic society and the wider public would have already considered many of the issues and challenges within the scope of the Commission's work.

Initial Call for Evidence and Contributions
(PDF Document)

Appendix F
Initial Call for Evidence Submissions

As part of Infrastructure Commission for Scotland's (the Commission) commitment to broad engagement the initial call for evidence was issued in March 2019. The Commission sought to gather evidence on Scotland's future infrastructure priorities and recognised that a number of organisations and individuals' from across industry, business, the public sector, academia, civic society and the wider public would have already considered many of the issues and challenges within the scope of the Commission's work.

The 'Call for Evidence' ran until the end of May 2019 and received over 140 responses from a wide range of organisations. The Commission re-examined the responses to the initial call for evidence for the second phase of its work, ensuring the broad viewpoints were captured within the Phase 2 Report.

The list of respondents is below, and where authorisation was received a copy of the organisation or individuals' response is attached.

Initial Call for Evidence Submissions
(PDF Document)

Appendix G
International Review of Long Term Infrastructure Strategy and Prioritisation

In order to inform the implementation of the Infrastructure Commission for Scotland's (the Commission) Phase 1 Report recommendations, the Commission has undertaken work to further develop recommendation 23, to establish the provision of Independent Long Term Advice (LTIA). The Phase 2 work also considers any changes that may be required to successfully implement the leadership recommendations from Phase 1 and how they could interface with the establishment of the LTIA.

To develop a greater understanding of the type and scope of LTIA , the Commission identified and reviewed a number of international organisations which work with, but sit independent or outside of, government. The desk-based research looked at the following organisations:

> UK – National Infrastructure Commission (NIC)
> Australia
>> Infrastructure Australia (IA)
>> Infrastructure Victoria (IV)
> New Zealand – New Zealand Infrastructure Commission (Infracom)
> France – Commission Nationale du debat public (CNDP)
> Canada
>> Quebec - Bureau d'audiences publiques sur l'environment (BAPE)
>> Montreal - Office de consultation publique de Montreal (OCPM)
> Singapore – Urban Redevelopment Authority (URB)

The Commission also recognised that the majority of countries infrastructure strategy development and prioritisation are maintained within government structures. We have therefore provided a brief overview of some countries who have been successful, without independent advice, on achieving a balance for infrastructure prioritisation and investment.

The full International Review of Long Term Infrastructure Strategy and Prioritisation Report can be accessed below.

International Review of Long Term Infrastructure Strategy and Prioritisation
(PDF Document)

Appendix H
System Wide Prioritisation

The Infrastructure Commission for Scotland (the Commission) recognised in its Phase 1 Report the need for a system wide approach to infrastructure, and a defined approach to cross sector trade-offs are required to deliver an outcomes-based approach to public sector decision making. It is critical to embed an outcome based decision-making structure which operates at a cross-infrastructure level, incorporating both spatial and sector needs, completed prior to budget allocations to ensure infrastructure spending focuses on the overall outcomes that Scotland is aiming to achieve, an inclusive net zero carbon economy.

This appendix provides detail of the various functional activities that may be required to enable the process of analysis and decision making that was set out in the Commission's Phase 1 Report to be completed and can be accessed below.

System Wide Prioritisation
(PDF Document)

Appendix I
Enabling Sustainable Places Engagement Report

Throughout the Infrastructure Commission for Scotland's (the Commission) Phase 1 engagement, stakeholders were universal in their desire to see good-practice place concepts used consistently when planning infrastructure, whether for developing new or existing places. Our places are seen to be at the intersection between the ambition of an inclusive net zero carbon economy and the right infrastructure, therefore understanding and responding to the needs of places is central to achieving the Commission's vision, as seen in Phase 1.

Building on the Phase 1 evidence and the strong policy framework, further targeted engagement was undertaken over April to June 2020, allowing for greater clarity on the areas that need to be better aligned, to ensure sustainable places are central to our decision-making. This engagement involved over 20 video-conference interview sessions of around 90-minute duration, engaging almost 50 participants from over 30 organisations. Appendix I provides a report of this engagement and can be accessed from the link below.

Enabling Sustainable Places Engagement Report

(PDF Document)

Appendix J
Delivering a Thriving Construction Sector Engagement Report

A major theme of the Infrastructure Commission for Scotland's (the Commission) Phase I report was the need to ensure the adoption of a whole system approach to infrastructure investment decisions. This recognised that the infrastructure we choose to invest in must contribute to wider outcomes that will benefit Scotland as a whole and not just a series of narrow or specific project outcomes; the Phase I recommendation that all new infrastructure investment decisions should be based on their contribution to the delivery of an inclusive net zero carbon economy serves to illustrate the point.

However, this concept of a whole system approach is not limited to only the decision-making or planning aspects of our infrastructure requirements. It also relates to the "hard" delivery of projects – whether this is for refurbished, reprioritised or new infrastructure - which can also be considered as the "market interface" between client and contractor, with outcomes dependent on a combination of many interrelated factors. These include, for example, the respective skills, capacity and competence of both client and contractor – are they right for the particular project; their relationship – is it collaborative or adversarial; and the procurement process chosen – is it appropriate for the particular project and is it being managed correctly. Getting these and other related issues right will have a major impact on the successful delivery of a project. Therefore, the delivery of a thriving construction sector will require the design and implementation of a number of individual process elements that in turn fit together to create a whole system.

To help inform the Commission's conclusions and recommendations which relate to the delivery of a thriving construction sector in Scotland, we have sought views and evidence from a range of stakeholders. Appendix J provides a report of this engagement and can be accessed from the link below.

Delivering a Thriving Construction Sector Engagement Report
(PDF Document)

Appendix K
Bibliography

As part of the Infrastructure Commission for Scotland (the Commission) evidence reviews, a number of published reports, data and documents have been considered. This information has assisted the Commission to gain a clearer understanding of the wide-ranging infrastructure issues and to help inform the Commission's engagement strategy. The Commission does not hold the rights to these publications and inclusion in the bibliography should not be seen as an endorsement of content nor acceptance of any recommendations included.

Bibliography
(PDF Document)