
Advance Our Nations, Fair

World-Class Infrastructure for Thriving Nations





ACKNOWLEDGEMENT OF COUNTRY

We acknowledge the Traditional Custodians of the lands on which we carry out our work, acknowledge their deep connection to land, water and culture, and pay our respects to their elders past, present and emerging.


RESPECT FOR TE AO MAORI

We respect the tangata whenua of Aotearoa and are committed to upholding the principles of Te Tiriti o Waitangi and to safeguarding te reo and other taonga.

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Thriving Nations Foreword

From the moment we wake to the moment we go to sleep, what we do and how we do it, is enabled by our infrastructure.

It is crystal clear, this century is one of change – for our lifestyles, our communities, our economies and our environment. Whether it is climate change, addressing inequality or riding the wave of the technology disruption, we will no longer be able to take our way of life for granted or ask the planet and people to bear the cost of doing things the same way that we always have. Delivery of a positive future for people, planet and the economy will not happen by accident. It is only possible through proactive, coordinated and collaborative action by people, for people.

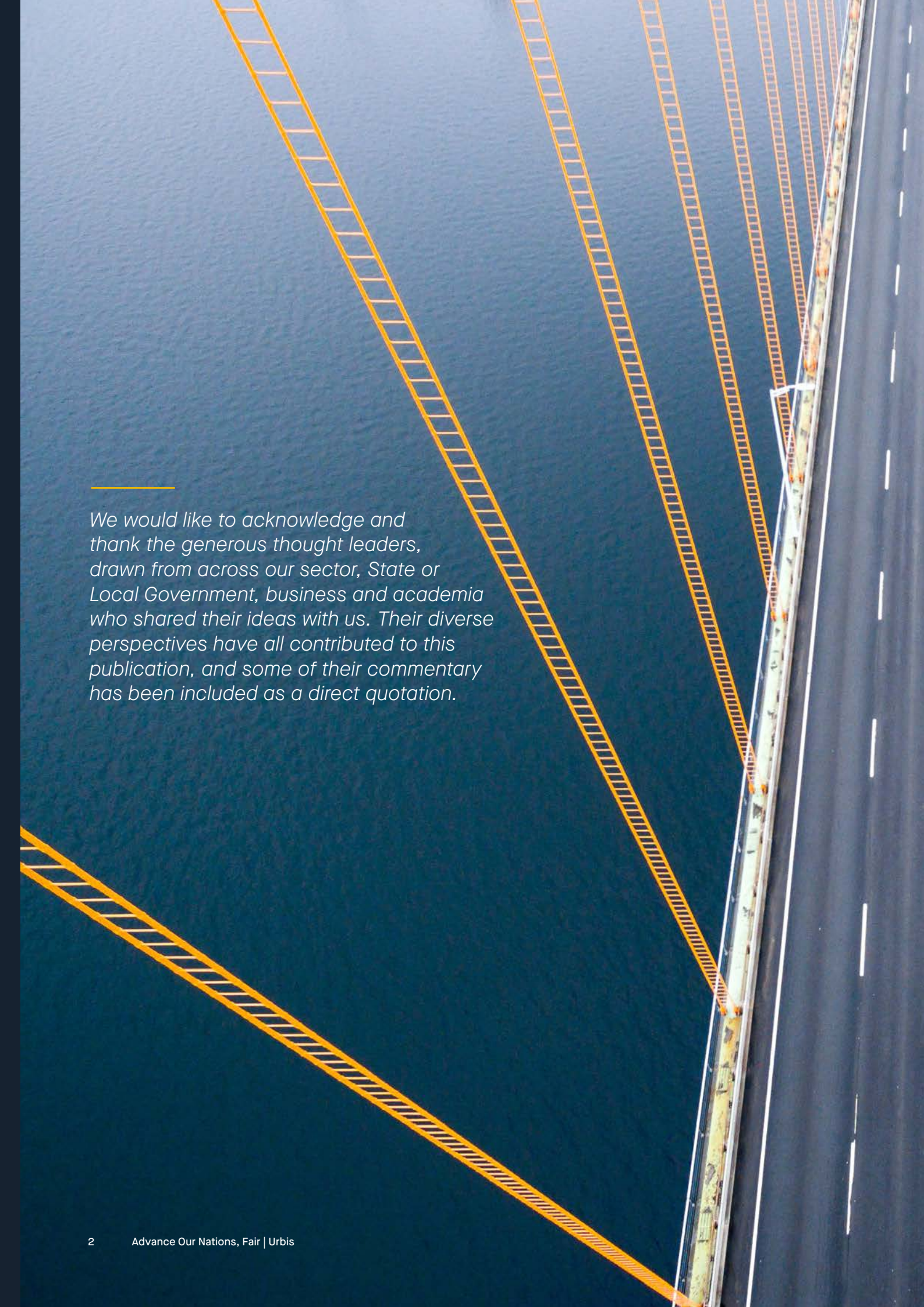
Infrastructure is going to be instrumental in building resilience and helping us drive and reinforce positive change. The infrastructure we plan, build and operate today will be the difference between surviving and thriving; now and for generations to come. This challenge needs to be seen, and seized by a world-class infrastructure sector.

We have crossed the chasm, and sustainability is no longer peripheral and localised; now it is becoming democratised and globalised. It is becoming competitive advantage, core business, and unlocking new markets. Sustainability, ESG, is yet to fully unleash as a catalyst for market transformation. As this happens, our sector will find its purpose; enabling people, places and planet to thrive. How? By delivering infrastructure for people, by people.

Together with our partners Urbis, we've explored the relationship between world class infrastructure and thriving nations, and mapped new opportunities that deliver investment returns for all beneficiaries, ecosystems, communities and economies. It will take foresight and increased interconnection; and a sectoral culture that is underpinned by action that is resourceful, resilient and responsible.

Together let's create a legacy our people are proud of.

Ainsley Simpson CEO
Infrastructure Sustainability Council

An aerial photograph of a road with multiple lanes, marked with orange dashed lines. The road curves from the bottom left towards the top right. The background is a deep blue, textured surface, possibly water or a sky. The text is positioned on the left side of the image, above the road.

We would like to acknowledge and thank the generous thought leaders, drawn from across our sector, State or Local Government, business and academia who shared their ideas with us. Their diverse perspectives have all contributed to this publication, and some of their commentary has been included as a direct quotation.

This is the start of a new era

Thriving nations are built by people, for people. They are the progressive, purposeful, egalitarian, entrepreneurial countries in which the life opportunities of all citizens are enabled and the natural systems are respected. They are the countries whose present day communities are making the conscious choice to be 'good ancestors' for future generations.

This paper explores the relationship between Thriving Nations and world-class infrastructure. It considers how we can maximise the long-term benefits enabled by infrastructure investment, and establishes what might hold us back. It is not an academic research paper, although it draws on a literature review, and neither is it the report of an industry engagement activity – albeit powerful industry voices participated. It is intended to inspire the infrastructure sectors to self-disrupt and work collaboratively towards a common purpose; that of delivering high performance, future-leaning infrastructure that supports national resilience and enables communities to thrive.

A series of stimuli have been considered in framing this provocateur, drawing on industry, government and academic sources as well as practical examples from real-world experience. Its starting point, the United Nations Sustainable Development Goals (SDGs) together with the global commitments enshrined in the Paris Agreement and more recently COP 26. Together, these provide the bookends that help us to understand what it will take to support transition to a resilient and equitable society – a Thriving Nation.

The heroic questions:

- » What will it mean to be a Thriving Nation, and how will we know whether we are succeeding?
- » What characterises world-class infrastructure and how does it support a Thriving Nation?
- » What will accelerate success and how can we chart a course for our sector to play to its transformational potential?

What is a Thriving Nation?

A Thriving Nation is fair – spatially and intergenerationally. It enables hopeful solutions to challenges, local and global, and ensures inclusive access to opportunity.

A Thriving Nation is for people, and is one in which everyone has the same opportunity to realise their best life; to meet their needs and achieve their dreams. It is a nation with a clear and collective purpose, where spatial and social inequalities are consciously addressed to ensure that everyone has an equal opportunity to participate.

It's a nation committed to net zero, prioritising the health and resilience of its people, places, landscapes and resources. It is progressive, sustainable, equitable, productive, creative, innovative, respectful and happy; a nation with a uniformly high quality of life. When a nation is thriving trust, social licence to operate, common purpose and accountability are high.

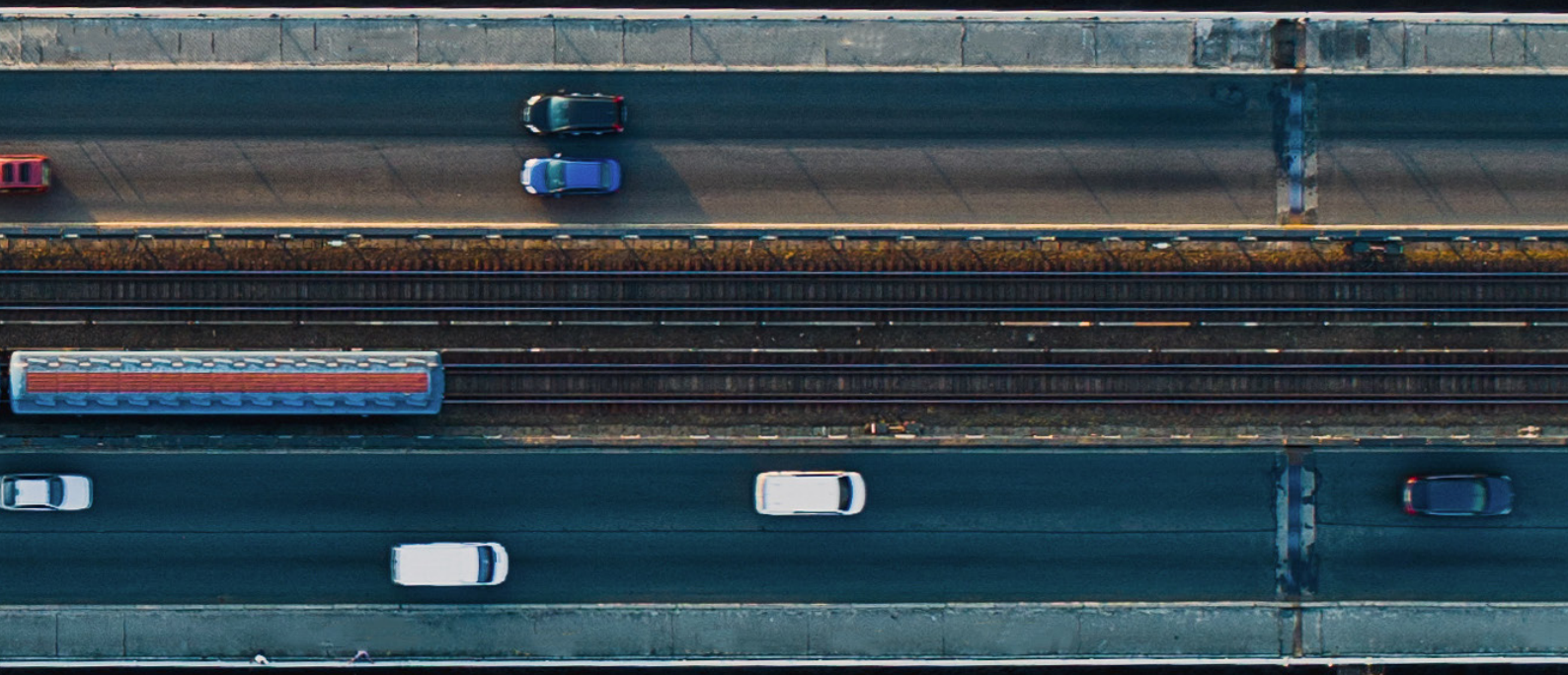


A Thriving Nation will foster inclusive growth by ensuring that now and in the future our whole community can live in dignity and is enabled by:

- » Fresh water that does not deplete resources
- » Green-blue infrastructure that is restorative
- » Reliable energy that does not degrade
- » Waste management that is responsible
- » Safe, secure, affordable and appropriate homes
- » Greater connectivity between and within settlements for people and goods
- » Roads and tunnels, ports and airports that transcend functionality
- » Digital platforms that adequately serve needs.

"A thriving nation has a common unifying purpose, everyone has a part to play and benefits to reap."

“We are the
contemporary
custodians of
these nations and
we work hard to
make them better
for each other and
for ourselves.”



The Thriving Nation pyramid

The United Nation's Sustainable Development Goals explore the fundamental building blocks for eradicating poverty and driving equitable social, economic and environmental progress globally.

The Thriving Nation Pyramid proposed in this paper builds on the foundations of the SDGs and complements them with the attributes that underpin thriving nations. It proposes a hierarchical framework for determining the extent to which a nation is continuing to make progress and recognises that not all nations will succeed equally against each dimension or attribute – at the same rate.

It is a pathway for understanding the progress that a nation is making holistically against the foundational dimensions of resilience or responsibility, and the emerging attributes of resourcefulness.

"A thriving nation cares about today's community but equally, it sets up future generations for success."



Resourceful

INNOVATIVE & IMAGINATIVE: Creativity (innovation and imagination) drives new ideas and transformative structures which disrupts the status quo, leading to better environmental, economic or social outcomes for citizens, and ultimately to an improved global leadership position.

WEALTHY: A thriving nation is wealthy, prioritising economic growth and job creation to combat the increased risk of national poverty associated with rapid urbanisation, aging populations and widening wealth disparities.

CONNECTED: A Thriving Nation is locally and globally connected, adopting the latest technology to meet and remain at the forefront of adapting city structures and individual lifestyles around the globe.

PLACE CAPITAL: A Thriving Nation is an attractive place to live, work, invest or visit with place capital that encourages a distinctive identity and enviable way of life.

EDUCATED: Learning for life with agile and integrated pathways that address the development of a resilient labour force and build future-orientated skills across areas that limit under-utilisation and enhance output capacity. Able to transmit knowledge and adopt new ideas rapidly to address future challenges and exploit opportunities.

Resilient

SUSTAINABLE AND RESOURCEFUL: A thriving nation is sustainable and resourceful. It prioritises restoration measures to mitigate the impacts of extreme weather events, providing durable means for its citizens to access water and food sources. Its developing cities meet the needs of current generations without compromising future generations.

ENVIRONMENTALLY CONSCIOUS: A Thriving Nation is environmentally conscious, acting to eliminate risks to human health, social systems, infrastructure development and ecosystems posed by climate change. It takes advantage of opportunities to develop new innovations within these areas.

INVOLVED: Many communities are engaged and actively participate in dialogue, decision making. There is a shared community life.

RESPECTFUL: Deeply acknowledging the culture and practices of all communities, ancient & modern, who contribute to our contemporary identity unifying knowledge systems.

Responsible

EQUITABLE: A Thriving Nation has equitable income, health, and education services that eradicate the risk of poverty for all and encourage sustainable social and economic progress.

HEALTHY AND HAPPY: A Thriving Nation prioritises the health and happiness of its citizens, acting to reduce reliance on healthcare systems and promotes the benefits of living and relocating to the country. It empowers individuals to achieve better social, work and innovation outcomes.

SAFE AND PEACEFUL: A Thriving Nation is safe and peaceful, allowing its citizens to live and flourish without a fear of violence or extremism.

HEALTHY GOVERNMENT: A Thriving Nation has healthy government structures that foster inclusive societies, empower individuals with freedom of choice and engage in an open economic environment. It has a strong social licence to operate.

Using the attributes of the Thriving Nation pyramid to compare success, we can see that every nation is on its own journey and experiencing success in different ways.

PLACE CAPITAL



Canada: #1 Most Popular Destination to Move Aboard in 2020 (according to the World Peace Index) – includes number of countries which Canada featured as the top overseas destination to move to

ENVIRONMENTALLY CONSCIOUS



United Kingdom: #4 on the 2021 Climate Change Performance Index – includes GHG emissions, GHG per capita, GHG 2030 Targets, current GHG trends

WEALTHY



United States: #1 Current biggest economy in the world

CONNECTED AND COMPETITIVE



United States: #1 on the IMD World Digital Competitiveness Ranking 2021 – includes an adoption of new technologies, business agility, ability to adopt innovative tech processes, prominence of tech talent

HEALTHY AND HAPPY



Spain: #1 on the 2020 Bloomberg Global Health Index – includes access to healthcare and quality drinking water, low pollution and risk of lifestyle disease

WEALTHY



India: #1 Fastest growing economy in the world

HEALTHY GOVERNMENT



Norway: #2 on the 2021 Legatum Prosperity Index – Includes personal freedom, freedom of governance, safety of governance

EQUITABLE



Sweden: #1 on the 2017 Development Finance International Inequality Index – includes taxation, social spending on healthcare, education and labour rights

HEALTHY AND HAPPY



Finland: #1 on the 2019 WHO World Happiness Index – includes satisfaction and joy in terms of health, government, income

RESPONSIBLE



Uganda: #1 2021 UN ranked most progressive refugee policy and accommodation

Namibia & Rwanda: #6 & #7 on the Global Gender Gap Index – includes economic opportunities, education, health and political leadership

INNOVATIVE AND IMAGINATIVE



South Korea: #1 on the 2021 Bloomberg Innovation Index – includes research and development capability, manufacturing capability, concentration of high-tech public companies

SUSTAINABLE AND RESOURCEFUL



Japan: #4 on the 2021 Environmental Performance Index – includes environmental health and ecosystem vitality

INNOVATIVE AND IMAGINATIVE



Singapore: #2 on the 2021 Best Countries Most Forward-Looking Index – includes five attributes; bureaucratic, dynamic, entrepreneurial, innovative and technological expertise

EDUCATED



Australia: #2 on the 2021 Best Countries Agility Index – ability to adapt and respond to challenges, movements and global events and adopt modern solutions

Australia: #2 on the 2021 OECD Better Life Education Index – includes secondary education levels, gender equality in achieving an education, reading literacy maths and science literacy

SAFE AND PEACEFUL



New Zealand: #2 on the 2021 Global Peace Index – includes absence of war, fear of violence, ongoing conflict, militarisation

Thriving is a journey

	Australia		New Zealand		Singapore	
	2013	2021	2013	2021	2013	2021
 Healthy and Happy	10	11	13 	9	30 	32
 Equitable	N/A	16	N/A	8	N/A	107
 Wealthy	3.29% 	4.54%	2.70% 	4.9%	4.84% 	7.2
 Safe and Peaceful	22 	16	3	2	16 	11
 Healthy Government	7 	16	5 	8	18 	14
 Sustainable and Resourceful	48 	13	14 	19	52 	39
 Environmentally Conscious	45 	55	41 	28	53 	<60
 Innovative and Imaginative	19 	25	17 	26	8	8
 Connected	16 	14	25 	20	4	5

Sources:

- » WHO Happiness Index
- » Development Finance International Inequality Index
- » GDP growth YoY
- » Global Peace Index
- » Legatum Prosperity Index
- » Environmental Performance Index
- » Climate Change Performance Index
- » Global Innovation Index
- » IMD World Digital Competitiveness Ranking

A Thriving Nation is not an end point, it is a journey which each nation is undertaking based on a different pathway aligned to its context, strength and vision.

No one nation gets everything right and unexpected shocks or disruptions to business as usual can rapidly derail or advance progress. In the following table we look at how Australia, New Zealand and Singapore compare with a range of global comparators against key indicators reveals that we are making great progress in some respects, but have more work to do.

Canada		USA		Estonia		India	
2013	2021	2013	2021	2013	2021	2013	2021
6	↓ 14	17	↓ 19	72	↑ 40	111	↓ 139
N/A	6	N/A	26	N/A	31	N/A	129
2.33%	↑ 5.69%	2.2%	↑ 2.27%	1.4%	↑ 9.6%	5.5%	↑ 9.5%
8	↓ 10	N/A	↑ 122	38	↑ 30	143	↑ 135
3	↓ 15	12	↑ 18	36	↑ 17	106	↑ 101
37	↑ 20	49	↓ 24	54	↑ 30	N/A	↓ 168
58	58	49	↓ 52	45	↑ 38	20	↑ 7
11	↓ 16	5	3	25	↑ 21	64	↑ 46
7	↓ 14	2	1	36	↑ 25	40	↓ 44

"Understanding how we are tracking, maintaining our progress and reporting back, not to our Boards but to our people, is critical to maintaining a positive direction of travel. We have to be held accountable to a higher purpose."

A Thriving Nation takes collective commitment

The story of Estonia

Estonia is one of the newest countries in the world; despite being an independent nation for only 31 years, it exhibits many 'thriving' characteristics and is underpinned by a singular national purpose which engages and unifies its population.

Tiigrihüpe (e-Estonia) is the digital strategy initiated in 1996 to enhance the country's global standing and national welfare. The Strategy was developed to catalyse the transition of Estonia from a former Soviet State to a liberal democracy with a high performance modern economy and has led to Estonia being the most advanced digital society in the world today.

Objectively, this success can be understood through changes in key data points between 1991-2021:

- » GDP per capita growth by 644%,
- » High school completion rates rising to 90%
- » Life expectancy rising by ten years
- » CO2 emissions per capita more than halving

Instead of mimicking other countries' policies as a way of 'catching-up' to established western capitalism, Estonia decided to take a leapfrog approach creating its own path towards a unique definition of national success.

Under its overarching National Development Strategy, Estonia invested heavily in digital infrastructure with the ascendant aim of eliminating social inequality, improving the wellbeing of Estonian citizens and creating competitive advantage amongst global counterparts.

Economic reform and strong sustained investment in people have built human capital and encouraged foreign direct investment. Key directions included creating digital infrastructure that enabled digital identities, education and training, facilitated increased interaction with government. It positioned new economic sectors and drove innovation

Despite critical education gaps experienced in the country throughout the early 2000's, Estonia reported the highest level of education throughout Europe in 2018, as well as the third highest in the world (OECD, 2019). This has led to the proliferation of knowledge and information service growth including global excellence in e-commerce and cyber security.

Moreover, streamlining public services has meant that Estonia's healthcare spend per person has been reduced to below half of other European countries despite average life expectancy increasing by 8 years over the same time frame.

Estonia's progress highlights that those that thrive do not necessarily need massive wealth, resource or development advantage, just a collective and inclusive purpose to live by and strive towards every day.

"This is an example not of catching up, but of leap frogging."

“Estonia is an example of a Thriving Nation – they have been very purposeful about what they wanted and where they wanted to get to: a future digital economy. Everything that they do now sums towards this. They have very young leaders who are less afraid and act with deep intention in everything that they do.”

The trends that challenge our ability to thrive

Mega trends are macro economic environmental and social forces that transcend geography: they operate collectively, profoundly shaping the future of nations, cities and communities.

These mega trends disrupt our established understanding of products, processes, services and experiences; whilst creating system-wide challenges, they are equally drivers of innovation and positive change. Individually and collectively these mega trends exert an influence on the resilience of human, economic and natural systems, compromising the effectiveness of infrastructure to support a thriving nation.



Urbanisation

By 2050, 68% of the world's population will live in urban areas; in both Australia & New Zealand more than 86% of the population already does. Supporting quality of life and productivity in metropolitan areas to ensure 'good growth' is an imperative that requires a collective growth management approach.



Technological Advancement

Technological change is exponential, disrupting business, social behaviours, service models, transforming industries and reframing how urban environments and natural resources are managed. Levels of localised digital disadvantage compromise macro -gains made in participation or innovation.



Demographic Change

By 2050, 1 in 6 people will be over the age of 65, globally. In Australia, New Zealand and Singapore, we have already reached this threshold and the super-aged (85+) is the fastest growing cohort. By 2050 our workforces will be shrinking, and our ageing population will need new infrastructure and services to support their needs.



Economic Transition

The rise of knowledge and experience-based economic activity is calling for new economic models and emphasising the importance of human capital. Digital platforms enabling work from anywhere have been accelerated by COVID-19 challenging the traditional corporate and workplace paradigms.



Climate + Carbon

Global warming and extreme weather events demand the reduction of carbon and a more systemic approach to resilience. The additional cost of maintaining a 1.5°C trajectory is estimated at USD9.2 Trillion a year to 2030. This scale of response demands collective action.



Health + Social Equity

COVID-19 amplified the challenge of unequal wealth distribution and elevated the significance of social and spatial equity. It reinforced the significance of strong social determinants of health. Allied to this is the fragmentation of social and institutional trust and the rise of grassroots action for change.

COVID-19 as a catalyst for transformation

COVID-19 has revealed the spatial and social inequalities that arise from the uneven distribution of infrastructure, insufficient or incomplete networks. A lightning rod, the pandemic has shown us how much, and how fast, we can change if we want to.

This is the point of conscious transition acknowledging the imperative of a more intelligent, place based approach to infrastructure development that is coherent and consistent between sectors and levels of government.

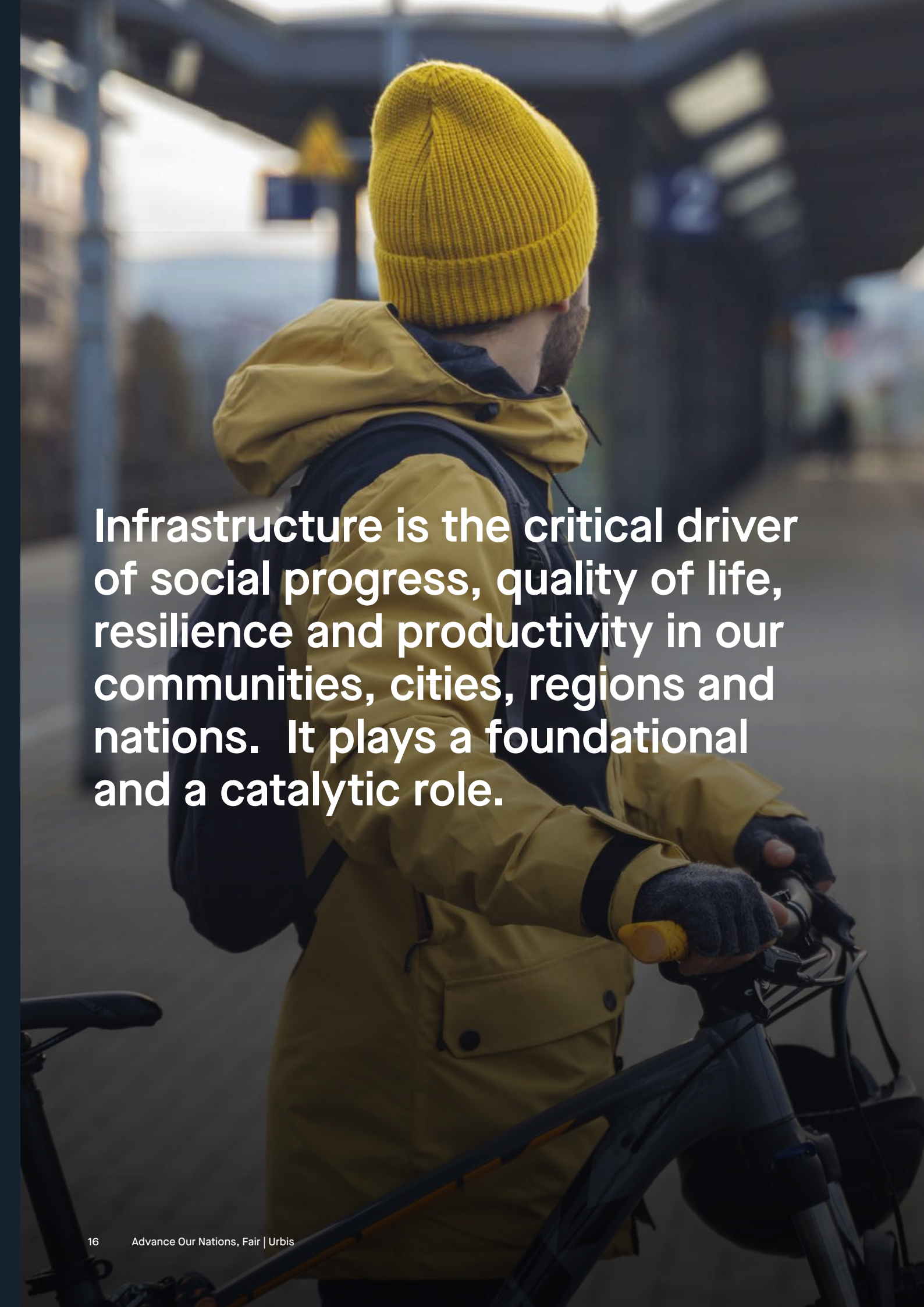
Far-sighted and purposeful recovery investment in infrastructure will create intergenerational value and drive transformational change as well as short-term stimulus, improving a nation's resiliency against all measures. It is therefore the time to consider our purpose and create an integrated and intergenerational infrastructure platform that drives a net zero nation that

is inclusive and equitable, productive and resilient with a uniformly high quality of life.


Delivering the transformation of our sector from 'just enough, just in time' to 'world-class' is going to take a firm commitment to collective action. Knowledge sharing and leadership is critical from across the value chain - policy, funding, procurement, construction, asset owners, shareholders (users), operational managers and regulators. Without this action, however, the infrastructure that we take for granted, will act as a handbrake on progress; those nations that hesitate or defer will fall behind those making more enlightened investments.

Further, as a sector we will lose our licence to operate if our infrastructure spend does not demonstrably make life better – for people or the planet.

"We are currently in an operating environment that has been destabilised by 'a tidal wave of shocks, stresses and black swan events' – now more than ever we need to understand short-term success and long-term transformation as to what infrastructure must enable for us."

A person wearing a bright yellow knit beanie and a matching yellow rain jacket is riding a bicycle. The person is seen from the side, looking forward. The background is a blurred urban street scene with buildings and a blue sky. The text is overlaid on the left side of the image.

Infrastructure is the critical driver of social progress, quality of life, resilience and productivity in our communities, cities, regions and nations. It plays a foundational and a catalytic role.



"Surely the kind of infrastructure we prioritise ought to reflect what kind of nation we want to be."

Infrastructure enables people to thrive

Thriving Nations are about people. So while conventional wisdom recognises the significance of infrastructure to the productivity and progress of nations, their cities and regions – a more enlightened approach places the wellbeing and resilience of people and natural habitats at the centre of decision-making.

Infrastructure plays both a foundational and a catalytic role, it supports people's lives and livelihoods, connecting them to the people and places they love physically and digitally. It is instrumental in efficient production, transport and trade which in turn address equity of opportunity and social determinants of health – reducing poverty at an individual and a societal level.

In this way infrastructure is a public good, which goes to the heart of why it is important to understand the sum total of all potential gains, accounting for every impact and ascribing it a value.

Infrastructure projects are complex, with long range timeframes and involve serious capital commitments as well as co-operation within the value chain to derive maximum benefit. The impact of infrastructure investment is simultaneously immediate and long term, direct and indirect- helping communities to catch up and forge ahead.

Forms of infrastructure are intersecting and mutually supportive, despite this the sector is not homogenous and can best be represented through a series of verticals. Yet systems of infrastructure need to be integrated to create a networked approach whereby investment in one system creates amplified value in all or at least some of the others.

More enlightened infrastructure can do more

Collectively, infrastructure systems support resiliency, productivity, quality of life and liveability.

Sub-optimal performance in any system compromises the integrity of the network, resulting in the failure of some, or all, communities to thrive.

As our nations grow and their infrastructure needs become more complex there is a systemic need to create more and different value from relatively less investment. This is the moment for bold thinking and decisive action, driving our sector towards a new era of world-class infrastructure.

Connective Systems



Transport

Fixed components of the transport system – road, rail and cycle networks, ports, harbours and airports.



Communications

Digital and communications networks and structures that supports the transmission of voice and data.

Supportive Systems



Utilities

The plant and pipes associated with water and sewage, power and waste disposal assets.

Natural Systems



Blue Infrastructure

Beaches, waterways and the infrastructure that supports their use.



Green Infrastructure

Natural and man-made landscape assets and vegetation.



Social Infrastructure + Built Environment

The homes, workplaces, education, health, sports and cultural institutions that safeguard quality of life and support productivity.

World-class infrastructure creates powerful future legacies

World-class infrastructure has foresight and impact. It is the infrastructure of resilience, and it drives measurable intergenerational value for everyone.

In the new infrastructure paradigm, being fit for purpose is a hygiene factor. Elegantly designed and creatively delivered, world-class infrastructure enriches daily life and contributes to the greater good: it decarbonises, democratises, digitises, decentralises and defines.

Interconnected and human centred, world-class infrastructure consciously addresses negative outcomes and capturing the widest benefits possible for the greatest amount of people over time. These outcomes only happen when cohesive policy intersects with data driven decision making and cross sectoral collaboration. In its planning, procurement, funding, operations, asset management and even decommissioning or repurposing – world-class infrastructure is intrinsically value adding and not value engineered.

The well-established minimum performance threshold for world-class infrastructure is that it meets our needs today without compromising our ability to meet future needs – but is this setting our expectations too low?? In seeking to be good ancestors, should we demand that the infrastructure we invest in today, creates a better world with stronger living systems tomorrow?



World-class infrastructure is a powerful change agent delivering intergenerational return on investment:

- » Creating long-dated assets
- » Addressing challenges
- » Facilitating equity and creating opportunity
- » Increasing resilience and sustainability
- » Driving productivity and competitiveness
- » Supporting real social mobility and progress
- » Enriching quality of life and enhancing lifestyle
- » Promoting identity
- » Inspiring hope for the future

"Is it really enough to meet the needs of today's community without compromising our ability to meet future needs? Is this not the moment to commit to decision-making that creates a better, stronger legacy for tomorrow."

“Infrastructure that does not solve problems or bring forward opportunities does not bring hope.”

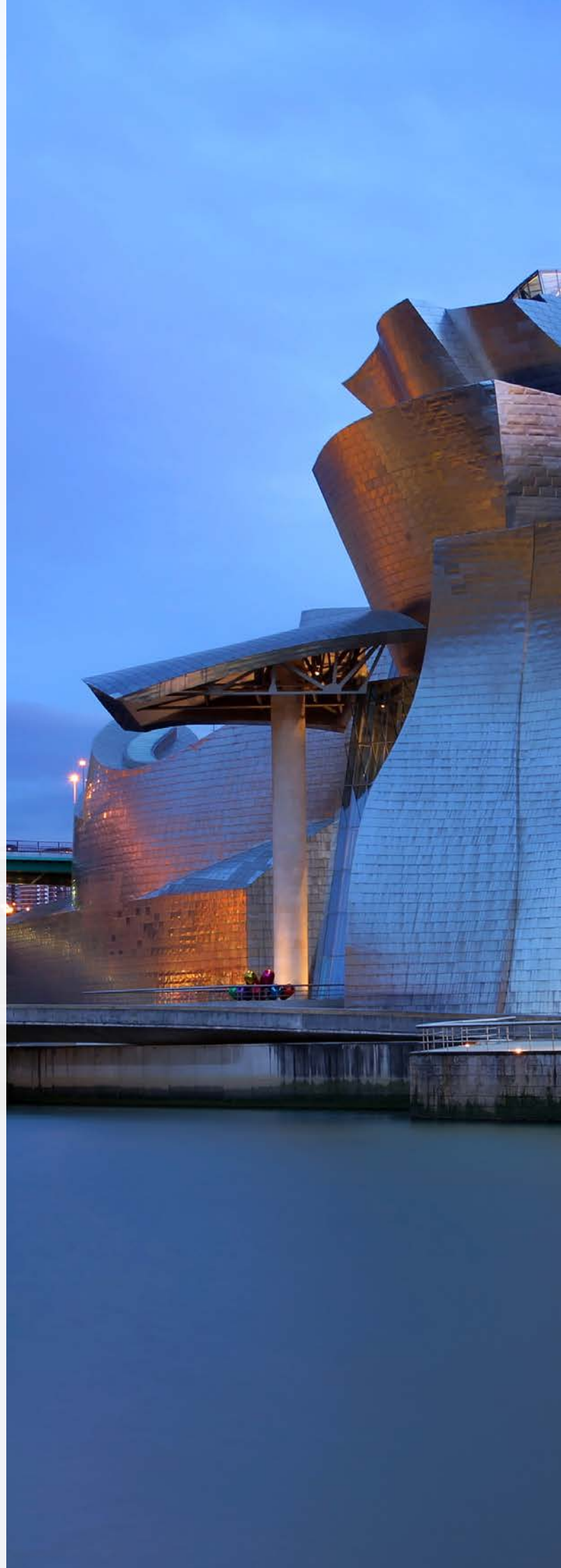


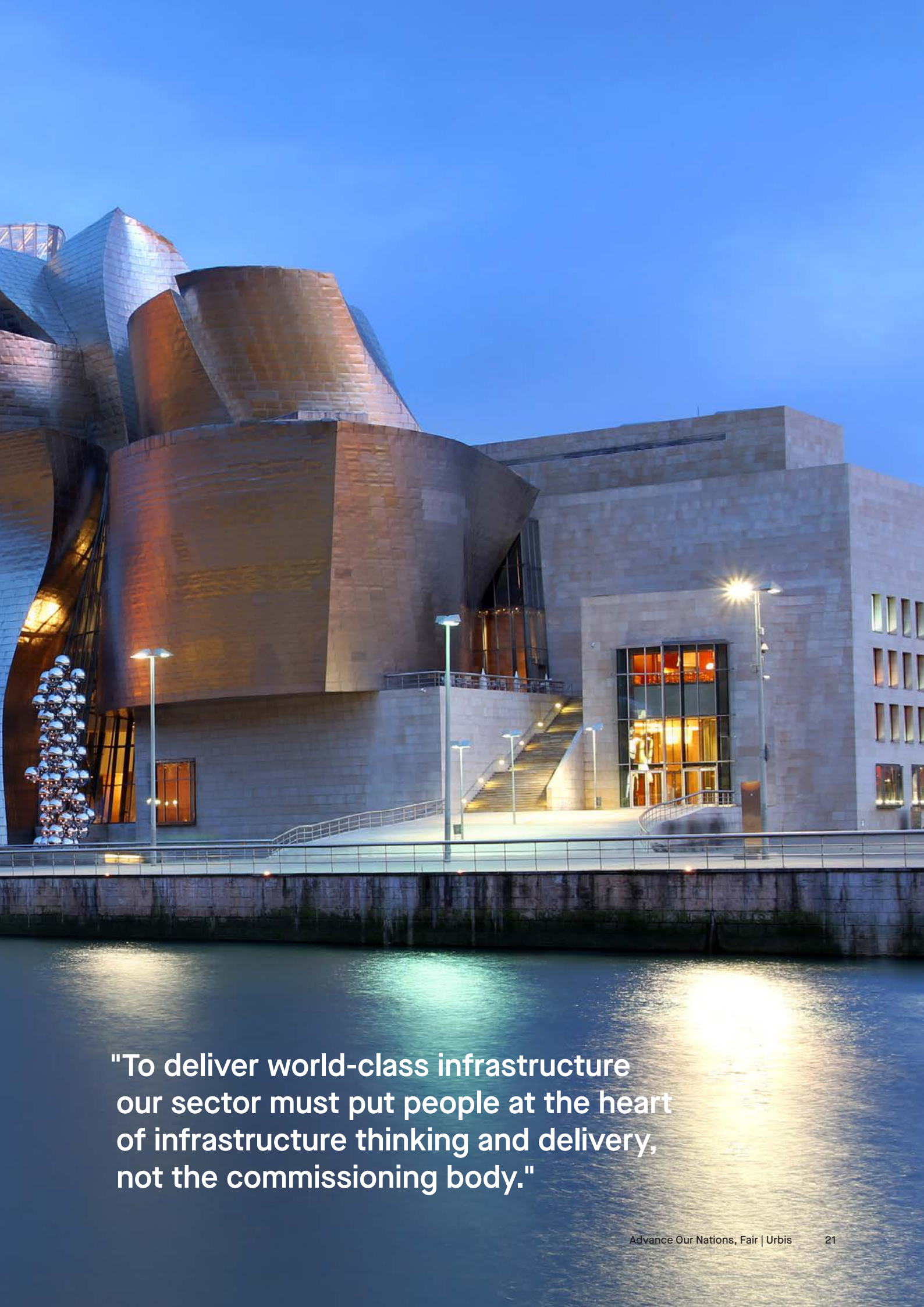
World-class infrastructure meets the 'Bilbao Test'

The Guggenheim in Bilbao is an exceptional piece of infrastructure; it has delivered broad enduring value at a regional as well as a national scale.

It challenges the norm and continues to add value in so many ways that are unexpected and unintended - so much so that we should call this the Bilbao test.

As we conceive and commission future infrastructure we should apply the 'Bilbao Test' to ensure that we maximise the inter-generational return on our investment.





**"To deliver world-class infrastructure
our sector must put people at the heart
of infrastructure thinking and delivery,
not the commissioning body."**

The Great Reset

The United Nations confirms that infrastructure is responsible for 70% of all greenhouse gas emissions and 88% of all adaption costs. In this context we have a real and present role to play in addressing the imperatives of climate change - today's infrastructure choices will determine tomorrow's carbon performance.

Within our region, we have experienced the impacts of climate change and the catastrophic aftermath of extreme weather events at an accelerating rate over the last decade; and we are already vulnerable to the negative impacts of poorly managed urban growth and declining productivity.

So, with half of the infrastructure portfolio needed to meet global needs in 2050 already planned, under construction or commissioned –surely it is time to stop ‘kicking the can down the road’ and make some bold moves to ensure a resilient, climate positive future? We cannot expect to rely on outdated infrastructure models and ‘business as usual’ solutions across our sector to deliver the transformational changes that will support Thriving Nations now and into the future.



The OECD suggests that in the countdown to 2030, an additional UDS\$1,000 per year for every person on the planet will be needed to meet sustainable development goals and climate targets: this is in addition to the planned infrastructure expenditure needed globally to sustain current levels of population growth.

Infrastructure for Climate Action, UNOPS 2021

Figure 2: Infrastructure sector contribution to total GHG emissions.

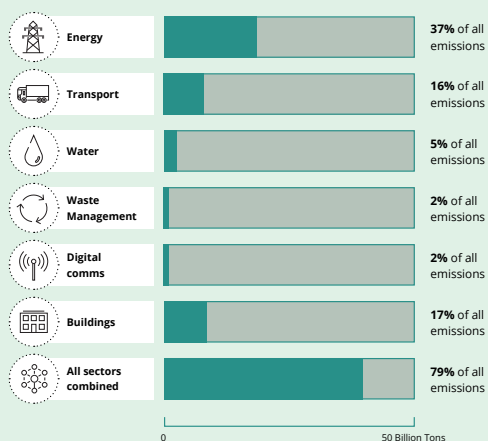
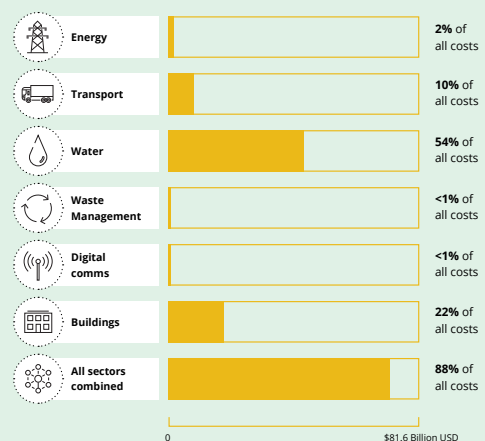


Figure 3: Infrastructure sector share of global climate adaptation costs (2010-50 estimates).



Credit Suisse has reported that the world's richest 1% of people own 50.1% of the global household wealth; while 1 in 6 children are living in extreme poverty according to UNICEF. Addressing equity and enabling communities to level up demands intentional leadership and a collective approach.

The UK Government has published its Levelling Up White Paper (2022), setting out the moral, social and economic agenda for transforming the UK and spreading opportunity and prosperity to all parts of the nation.

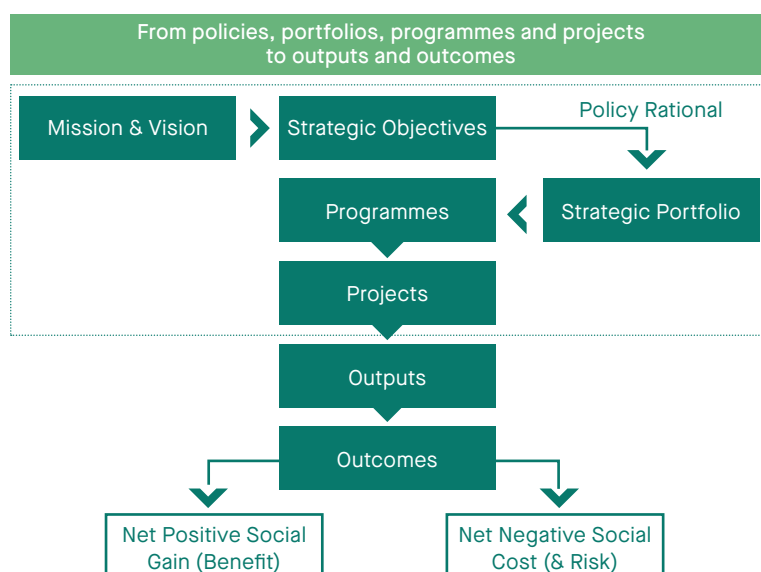
Their proposed approach is already supported by the recently reframed approach to setting policy, planning, designing and procuring infrastructure – set out in the Green Book; this adopts a levelling up approach, consciously addressing spatial and social inequality.

HM Treasury Green Book presents guidance on how to appraise and evaluate policies, projects, and programmes. This publication also provides guidance about the design, evaluation and monitoring of projects – before, during and after implementation.

The Green Book is not a mechanical or deterministic decision-making device. It provides approved thinking models and methods to support the provision of advice to clarify the social – or public – welfare costs, benefits, and trade-offs of alternative implementation options for the delivery of policy objectives. The recent White Paper extends this approach and sets out a 'complete systems change that establishes how Government will work differently to implement this levelling up agenda. It mandates that all central Government departments align to the levelling up agenda and introduces public metrics to track progress.



The Green Book: Appraisal And Evaluation In Central Government, 2020



The need for independent, transparent evidence

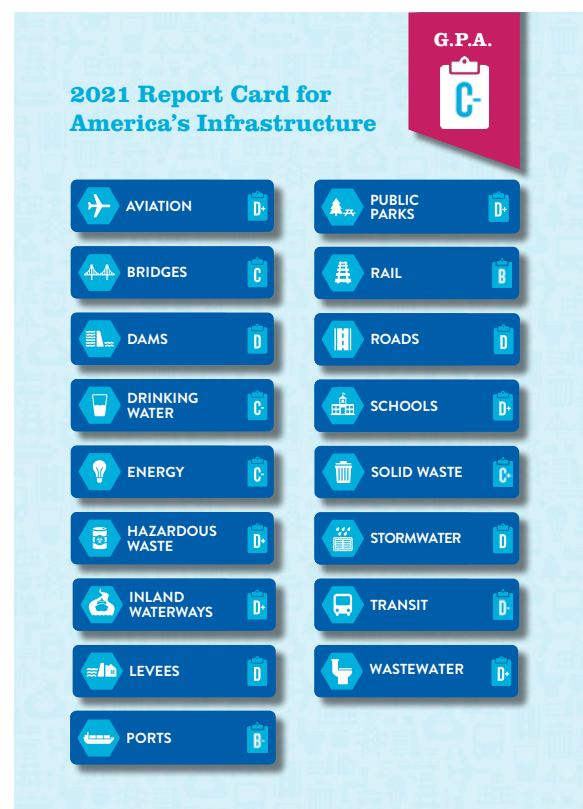
The American Society of Civil Engineers Infrastructure Report Card

An independent review of America's infrastructure scored C-; but the report demonstrated significant in addressing lagging performance.

The American Society of Civil Engineers has been comprehensively exploring the performance of US infrastructure in 17 categories for more than two decades. The Society transparently tracks progress and decline nationally through its state and metropolitan area score cards, undertaken at four yearly intervals. Despite the mediocrity of the overarching score, which reflects chronic and systemic underinvestment, there is room for hope – this is the first time that the overall performance of the nation's infrastructure has risen above D range.

The methodology of the Report Card has been rigorously assessed resulting in broad, cross-party political and public support. It aggregates information relating to capacity, condition, funding, future need, operation and maintenance, public safety, resilience and innovation.

The 2021 Score Card has been acknowledged as a key advocacy platform contributing to the bipartisan approval of President Biden's USD1.2 Infrastructure Act. The capital injection of infrastructure spending seeks to address lags as well as providing the foundations for a leadership position.



National IRC 2021 Report (Visualised by Urbis)

We have a strong, principled approach to build on

The 2021 Australian Infrastructure Plan is an ambitious people-centred plan for reform, calling for a pathway to the challenges and opportunities identified in the 2019 Infrastructure Audit. Sustainability and resilience are valued as strategic priorities.

The Infrastructure Australia Plan emphasises the importance of national harmonisation, sectoral and system-level policy and principles.

The Plan intends to reflect industry consensus about the way forward and provide a national standard for best practice infrastructure developments. It considers the spatial and temporal implications of projects and evaluating them against criteria of strategic fit, social economic or environmental value, and deliverability.

It provides a national approach for better practice infrastructure development and explains our requirements and process for assessing proposals. Recognising that systems of infrastructure are integrated and create a network whereby investment in some systems creates amplified value in (at least some) others. Its scope focusses around major construction projects, although its principles provide useful guidance to infrastructure projects that fall outside of its remit.

The Assessment Framework is divided into an overview and four main volumes, reflecting four stages of project development and submission.



STAGE 1

Defining the problems and opportunities



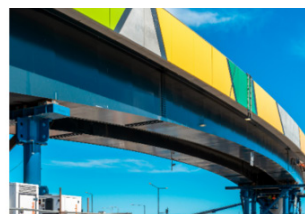
STAGE 2

Identifying and analysing options



STAGE 3

Developing a business case



STAGE 4

Post completion review

What are the barriers to world-class infrastructure performance?

1

Fragmentation

The lack of a consistent national framework is a significant inhibitor. The lack of integration between infrastructure sectors and sub sectors is further complicated by geographic and policy fragmentation.

Policy drivers, contexts and delivery models are not aligned between jurisdictions and yet there are significant inter-dependencies with local priorities relying on State and Federal funding.

The communities we serve are not cohesive and are increasingly cynical about process, decision-making and delivery.

The need for infrastructure sectors to discover a shared purpose and 'join-up' its thinking and action is urgent.

2

Systemic Subjectivity

Whilst aspiring to be evidence-based we have an overlay of systemic subjectivity which is perceived as politicised decision making. Clarity and consistency will sustain improved performance.

Budget and political cycles lead to project allocation and cancellation – hampering strategic sustained investment programmes and reducing the efficient deployment of private sector capital. Traditional metrics fail to account for all positive externalities leaving benefits and costs under-counted.

Funding certainty and security that transcends short-term cycles is a critical success factor.

Infrastructure represents sectors of profound significance to our progress, yet it is characterised by silos, cycles and cynicism. We are using yesterday's approach to drive tomorrow's solutions.

The community is central to infrastructure service design yet we have infrastructure systems that are struggling to meet growth in demand and changes in end-user needs and expectations across many geographies and sectors. We've identified four key factors that impede infrastructure productivity and slow the delivery of a world-class infrastructure system capable of supporting a thriving nation.

3

Speed of Innovation

Necessary risk aversion leads to safe outcomes but delays performance innovation – which is sporadic (sector or place based) and not embedded in our planning and delivery culture.

Whilst there are examples of global excellence, sharing and scaling is too slow. IP is either protected as a competitive advantage or lacks mechanism for sharing.

Powerful mechanisms for collaboration and sharing IP will enhance performance and build comparative advantage.

4

Sectoral Capacity

Building advanced sectoral skills is too slow and we do not have 'the best minds' working on 'the most complex challenges'. There is an urgent need to build the profile of infrastructure as a meaningful and progressive career choice – focusing on attraction and retention of talent as well as its development.

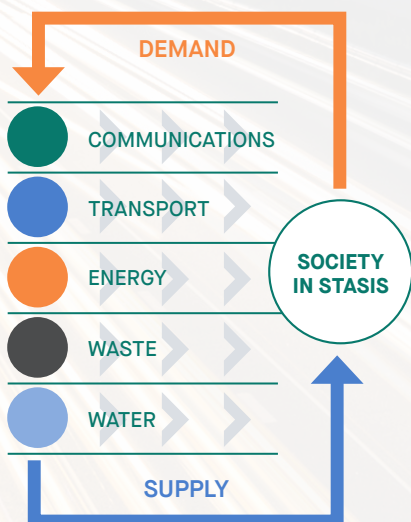
Risk aversion and inertia offset good leadership; new energy and cultural change are essential to drive transformational infrastructure outcomes.

We need to reignite hope and aspiration, addressing our licence to operate.

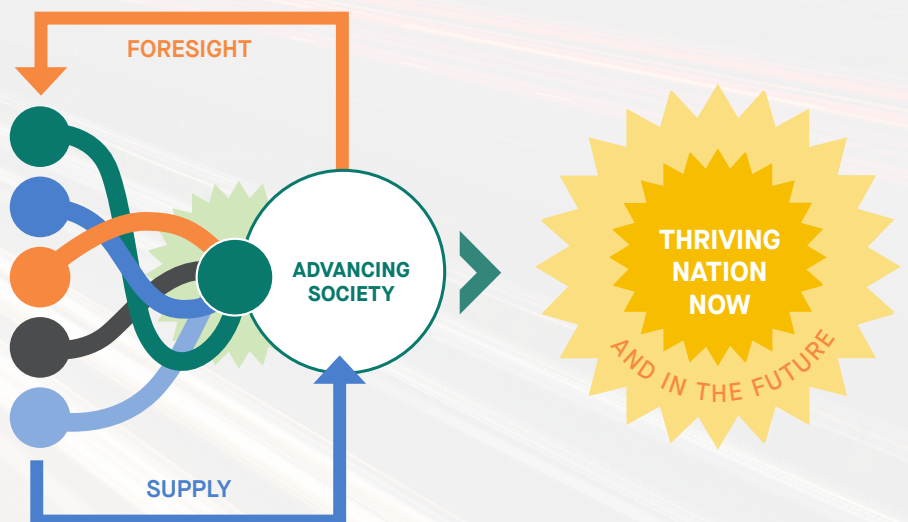
If not now, when?

The need for boldness is immutable if we want to leapfrog from a low hope to a high-performance paradigm, in which a fully integrated world-class infrastructure network supports a thriving nation. Key to this is creating a picture of a future nation worth aspiring to, because once we have worked out the shared vision of ultimate success - we can solve for the infrastructure solution that will support it.

**BUSINESS AS USUAL
SURVIVAL MODEL**



**TRANSFORMATIONAL
THRIVING NATION MODEL**



Thriving Nations have a world-class infrastructure sector, with a collaborative infrastructure team that has stepped up and created the bold solution needed together operating in a high trust, high co-ordination, high investment and high-return environment.

Where should we focus our effort?

CHAMPION

AN INDUSTRY UNITED BY ITS DECLARED PURPOSE

Driving change from within underpinned by a cultural shift from monopolistic to a common-good approach.

TRUST, KNOWLEDGE AND CAPACITY BUILDING

Accelerate the sharing of new ideas to build trust within and between sectors, enhance skills and drive service level innovation.

CODIFYING EXCELLENCE

Setting out the standards of world-class infrastructure to clarify expectations; ensuring alignment with relevant international rating systems.

A ROBUST DATA PLATFORM

Combining the longitudinal and real-time information required to drive evidence-based decision-making. Underpinning transparent prioritisation and business case development.

A FULLY INTEGRATED INFRASTRUCTURE LATTICE

With coherent implementation pathways that recognise interdependence and create convergence opportunities across the network.

PLACE-BASED, CREATING INTERGENERATIONAL VALUE

Clearly solving for a defined problem and generating new opportunity through more enlightened delivery models grounded in conversations with the end user.

PROCUREMENT BASED ON MULTI-DIMENSIONAL VALUE

Capturing all positive externalities and addressing negative impacts. Embedding resilience and demonstrating the highest and best use of funds.

FUNDING SECURITY

Depoliticising funding and increasing certainty, connecting funding to outcomes overtime. Leveraging new forms of finance instrument to meet the burgeoning cost of transformational infrastructure.

ADVOCATE

"We need to recognise that the competitive forces are not our market colleagues, they are the ticking clocks of climate change and social equity."



What can we learn from the boldness of others?

The following represent just a few examples of boldness in action at a national scale; they reveal to us some important characteristics of a world class approach to infrastructure as a change agent.

Purpose

The purpose of the infrastructure intervention is clear and has been well-defined by a critical social or environmental problem, rather than a generic or nation-building economic driver.

Progress

It makes the impossible happen and can transform laggards to leaders within a generation.

People

Infrastructure is serving the needs of communities, it is a means (enabling and serving) but not in and of itself, an end.

Partnership

It relies on multiple partners working collaboration within a high trust equilibrium to succeed.

Transport Infrastructure

From no public transport to the best system in the world

With twice the population density of New York, Seoul is one of the most densely populated cities in the world (Rahmat, 2017). As such, during the late 20th century, Seoul's government made the conscious decision to create an entirely new transport network that would reduce immediate congestion as well as accommodate its growing population over the century to come.

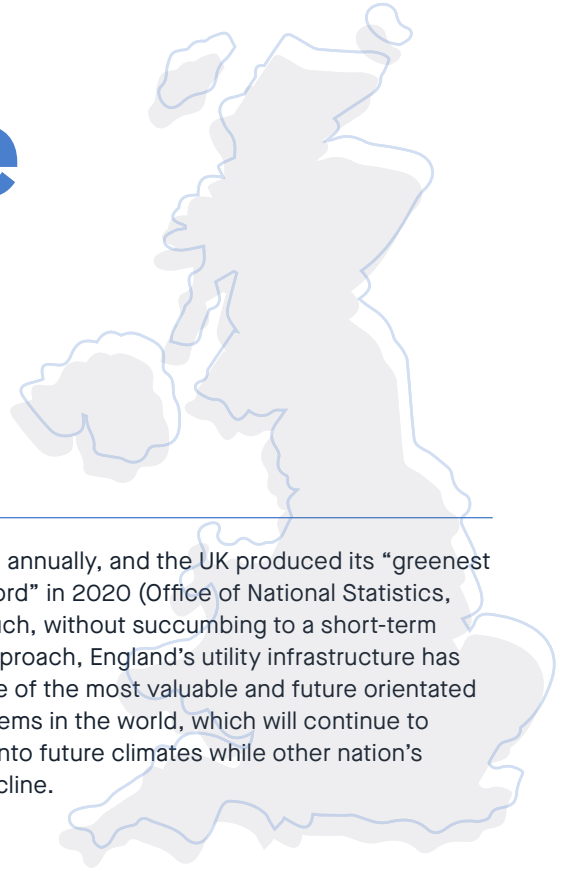
'Transport Transfer Centres' which streamline multiple forms of public transport were integrated, as well as world-first digital infrastructure (named TOPIS) which calculates subway overcrowding before it happens and subsequently adjusts the frequency of trains in real time (Seoul Metropolitan Government, 2021).

Through a future-investment made 60 years ago, Seoul today now owns the most valuable transport system in the world despite growing to become the world's third busiest metro throughout the same timeframe.



Transport Transfer Centre, Seoul, South Korea

Utility Infrastructure



Infrastructure which produces the “greenest year on record”.

The United Kingdom illustrates how infrastructure can be implemented to mitigate longer-term threats associated with the global climate emergency.

From the beginning of 2008, various forms of tidal and wind energy were installed across England to reduce fossil fuel consumption.

As a result of the decade-old investment, today coal accounts for only 2% of electricity generation (down from 40% in 2012), clean energy generates nearly

GBP6 billion annually, and the UK produced its “greenest year on record” in 2020 (Office of National Statistics, 2021). As such, without succumbing to a short-term band-aid approach, England’s utility infrastructure has become one of the most valuable and future orientated energy systems in the world, which will continue to accelerate into future climates while other nation’s systems decline.

From 'Garbage Island' to recycling capital of the world

Once nicknamed 'Garbage Island', Taiwan collected and incinerated just 70% of its rubbish (and recycled none) until the beginning of the 21st century (CEPO, 2021). Today, it is home to the second most efficient recycling system in the world because of infrastructure investment made two decades ago.

Through the establishment of industry clusters which were created around the central principle of sustainability, industries are physically clustered together to reuse waste products, excess materials, information and resources that other companies do not need in their own production process.

Technology has also been implemented to identify areas of improvement and further industry integration.

The outcome has meant Taiwan has reduced the amount of waste entering landfills to less than 2% and government has converted former landfill sites into parks and community areas. In this way, innovative infrastructure design has been employed to mitigate short-term strain while also adding long-term productivity increase (CEPO, 2021).

Waste Infrastructure

Germany: Tomorrow's innovations backsolving contemporary challenges

From the 1980s onwards Germany had faced challenges of exponential growth in waste production, compounded by limited land for its disposal and mounting concerns about the environmental consequences of both landfill and incineration solutions.

In 2008, it became the pioneer of the European Union's Waste Framework Directive, driving systems change to reduce, re-use, recycle and recover. It did so by prohibiting the use of landfill for municipal solid waste (MSW) and deploying a future-oriented infrastructure strategy which redeveloped recycling plants to increase efficiency and introduce 'energy-recovery' systems.

Today, Germany's landfill gas has been reduced to almost zero, equivalent to the reduction of more than 30 million tonnes of carbon dioxide per year – making it one of the only nations in the world that completely avoids MSW landfill.

Germany's 'energy-recovery' infrastructure was one of the first such systems globally – transforming 98% of MSW into fuel for power generation.



Blue Infrastructure

Prepared for disaster

With California reporting the most extreme year of drought in more than a century last year, the ability to create and maintain blue infrastructure is not only necessary but vital for the health of its inhabitants.

To meet the water demand, the state has avoided implementing singular reactive infrastructure, instead opting to build a progressive 'water-grid' that captures water months in advance and diversifies its collection rate.

Introduction of the Carlsbad Desalination Plant (the largest plant in the western hemisphere) produces 50 million gallons of desalinated water a day (Carlsbad, 2021). A multi-purpose water storage system extends across two-thirds of California to collect excess water from canals, pipelines, and reservoirs, and water monitoring technology is fitted in every house to minimise water leaks (Department of Water Resources, 2021).

In this way, long-term infrastructure planning completed more than five years ago did not only add value to the state but ensured vital health and safety standards were maintained in future times of disaster.

The benefits of infrastructure are global

Infrastructure is increasingly becoming a major political tool amongst nations. The Blue Dot Network run by the US, Japan and Australia is an example of this.

Recognising that individual countries are only as strong as their counterparts, the Blue Dot Network aims to bridge the development gap experienced across the

globe through a USD40+ trillion investment in blue infrastructure such as ports, bridges and 5G networks worldwide (The White House, 2021).

Such a calculated move demonstrates that the power of infrastructure stretches far beyond its physical use and immediate return and should instead be considered for its long-term value creation and a tool to expand and grow global productivity, power and resilience.



Kinetic Infrastructure

Infrastructure reimagined beyond rudimentary need

Tourouvre-au-Perche is home to the world's first solar panel road system.

Roads in the town consist of solar panels covered with a layer of protective silicon which replicate a traditional road structure while simultaneously collecting solar energy. The infrastructure is so efficient that 20 square meters of road can provide enough energy run an entire household daily.

Such innovation is an example of how infrastructure can consciously be reimagined at any scale to create additional layers of value beyond addressing its core purpose.



Digital Infrastructure

Singapore: Supporting value in every sector

Singapore has treated its infrastructure investment as a national quest to become the most technologically advanced country in the world, and as such, has employed digital infrastructure to accelerate innovation and value creation in a multitude of diverse activities.

Through its 'Smart Nation' projects, it has created a 'Smart Nation Sensor Platform' to monitor the efficiency of utilities across the nation, and a 'CODEX platform' to share urban data between the private sector and government. It is also currently constructing an entirely new digital city fitted with the most innovative technology for daily living and working (Smart Nation Singapore, 2021).

Digital infrastructure has therefore not been treated as a tool to meet one specific need, but a foundation to thrive in every area of society.





The Infrastructure Sustainability Council is a member-based, purpose-led peak body working in Australia and Aotearoa New Zealand to enable sustainability outcomes in infrastructure.

Our purpose is to ensure all infrastructure delivers environment, economic, social and cultural benefits, delivering a positive future for people, planet and the economy.

We proud custodians of the IS Rating Scheme (IS), Australia and New Zealand's only comprehensive rating system for evaluating economic, social and environmental performance of infrastructure across the planning, design, construction and operational phases of infrastructure assets.

For future information please contact:

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Infrastructure is the critical driver of social progress, quality of life, resilience and productivity in our communities, cities, regions and nations. To ensure its success for the people it exists to serve, it requires the critical forethinking and skill of a multidimensional expert team.

Collaboration, co-design and a deep-rooted desire to shape our world for the better are key to success. By understanding the elements that support great outcomes and being equipped with the tools and connections to achieve them, Urbis is in a unique position to help developers, investors and innovators build world-class infrastructure for the future.

Our interdisciplinary team combines capabilities in policy and strategy, economics, spatial data science, design and systems thinking, and behavioural insights. We are passionate about tackling the world's most pressing urban challenges and making an impact where it matters most – improving lives, building strong economies, and protecting the planet.

We exist to generate positive and lasting change – and we want to work with you to deliver the world-class infrastructure solutions needed to achieve and sustain Thriving Nation status.

Kate Meyrick
Director Future State
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