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National Security Group
Department of the Prime Minister and Cabinet
Level 8 Executive Wing, Parliament Buildings,
Wellington 6021

Via email: InfrastructureResilience@dpmc.govt.nz

IPWEA response to the New Zealand government's discussion document on how to enhance the resilience of Aotearoa New Zealand's critical infrastructure system

Dear Review Panel,

The Institute of Public Works Engineering Australasia (IPWEA) welcomes the opportunity to present its response to the New Zealand government's discussion document on how to enhance the resilience of Aotearoa New Zealand's critical infrastructure system.

IPWEA is the peak association for infrastructure asset managers and professionals who deliver public works and engineering services. Representing close to 5,000 members across Australia and New Zealand, and an online community of more than 40,000, IPWEA is the industry leader in infrastructure planning, delivery and operation.

On behalf of the IPWEA membership, our response to the discussion document can be found on the following pages. Setting the scene and contextualising our response is critical in understanding the broader issues. Therefore, our submission is aligned with our White Paper (2022): "[Best practice asset management of essential public infrastructure](#)".

At a high level, the key to this review is to determine a nationally consistent, and scalable framework that will generate stakeholder priority input, a sustainable and affordable infrastructure pipeline aligned to legislative requirements, policy objectives, expert advice and a carefully developed risk assessment matrix.

Our experience has demonstrated that with the right legislative framework, supportive guidance, tailored/appropriate education, and follow-up will significantly improve the performance of the infrastructure portfolio and the people who manage it. This, in turn, will lead to effective outcomes by mitigating risks and avoiding, at times, unnecessary additional investment of public funds.

IPWEA is proud to promote professionalism, education and knowledge sharing to enhance the quality of life for our communities. This is achieved through well-planned and resilient infrastructure, and we look forward to working with the New Zealand Government in this endeavour.

Please contact us directly for further discussion if you have any queries regarding our submission.

Yours sincerely



David Jenkins
IPWEA CEO



Ross Goyne
IPWEA Asset Management Committee Chair

Overview

Our communities rely on infrastructure assets that provide services that support their daily lives and activities. This is directly proportional to the health and prosperity of the Nation. Some of this infrastructure will be managed by local governments but some key critical infrastructure will be managed by the New Zealand government. It is therefore important to have integration between all levels of government to ensure common desired outcomes are achieved effectively and efficiently. Because this discussion document relates to critical infrastructure the Nation depends on to operate and provide national wellbeing, the infrastructure must not only be sound, but resilient to numerous factors that can impact the infrastructure's ability to maintain community wellbeing.

IPWEA fully supports the drive to underpin resilience in the provision of critical national infrastructure. It is noted that the government currently has not yet overlaid a comprehensive coordinated approach to critical infrastructure regulation. IPWEA recently made a submission into the review of 'Infrastructure Australia' and emphasised the need for establishing an integrated and coordinated national framework within which significant projects, such as critical infrastructure, can be planned for, designed, built and maintained to optimal effect. Infrastructure planning at this level must be comprehensive and systematic.

The range of threats to critical infrastructure is now much broader than natural disasters and hence this reinforces the need for a regulated inter agency integrated and coordinated approach using an adopted national critical infrastructure management framework.

Rather than focussing on the specific feedback questions listed in Appendix C discussion document, IPWEA is providing guidance at a strategic level which should provide the environment and tools within which the necessary changes to develop and maintain a resilient critical infrastructure system.

The need for adaptation

While the discussion paper quite rightly points out global megatrends of changing climates, national security, economies and technology that pose challenges for critical infrastructure systems, there are several challenges on the local, regional and national front that also heighten the risk of infrastructure failure.

1. **Changing demographics** can have significant impacts on infrastructure systems in various ways. Demographics refer to the composition of a population, including factors such as age, gender, ethnicity, migration patterns, and socioeconomic status. When these demographic characteristics undergo shifts, it can directly influence the demand for and requirements of infrastructure.

To effectively manage the impacts of changing demographics on infrastructure, governments, urban planners, and policymakers need to conduct thorough assessments, engage in long-term service, asset and financial planning, and prioritise investments to ensure that infrastructure systems remain resilient, adaptable, and responsive to the evolving needs of the population.

2. **Skills shortage** can have significant and far-reaching impacts on infrastructure systems. When there is a lack of skilled workers to design, build, operate, and maintain infrastructure projects, several challenges can arise, leading to potential delays, increased costs, and compromised quality of infrastructure. This can also lead to the infrastructure assets not achieving the desired useful life and need for earlier renewal.

To address skills shortages and mitigate their impacts on infrastructure systems,

governments and relevant stakeholders need to focus on workforce development, training programs, and initiatives that encourage more individuals to pursue careers in infrastructure-related fields. Investing in education, vocational training, and apprenticeship programs can help build a skilled and sustainable workforce capable of meeting the challenges posed by infrastructure development and maintenance.

3. **Aging Infrastructure:** Many critical infrastructure systems were built decades ago and need repair, maintenance, and modernisation. Aging infrastructure can lead to reliability issues, decreased efficiency, and potential safety risks.
4. **Financial Constraints:** Adequate funding is essential for maintaining and upgrading critical infrastructure. Budgetary constraints can lead to deferred maintenance, limited investment in modernization, and increased vulnerability to failures.
5. **Regulatory and Policy Challenges:** Complex regulatory environments and overlapping jurisdictional responsibilities can hinder effective planning, coordination, and decision-making for critical infrastructure projects.
6. **Supply Chain Disruptions:** Global supply chain disruptions, such as those seen during the COVID-19 pandemic, can impact the availability of materials and components needed for infrastructure construction and maintenance.

To address these challenges, it's important for governments, private sector entities, and communities to **work collaboratively to develop comprehensive strategies that enhance the resilience, security, and sustainability of critical infrastructure systems**. This may involve investments in technology, research, training, policy development, and public engagement to ensure that these systems can effectively meet the needs of society while mitigating potential risks.

Potential options

The environmental, financial, and social implications of enhancing critical infrastructure resilience will be significant. Strategic planning, efficient management, and proactive decision-making are essential to ensure lifecycle costs and risks are kept to a minimum for our communities. Here are several ways to achieve this goal:

1. **Design for Longevity and Maintainability:** Incorporate durable materials, design features, and construction methods that minimize the need for frequent repairs and replacements. Emphasize maintainability by designing systems that are easy to access and service.
2. **Lifecycle Cost Analysis:** Conduct thorough lifecycle cost analyses to compare different design, construction, and operational options. Consider factors such as initial costs, maintenance expenses, energy efficiency, and expected service life to make informed decisions.
3. **Predictive Maintenance:** Implement predictive maintenance techniques that use data and technology to monitor the condition of infrastructure components. This allows for timely maintenance before major issues arise, reducing downtime and repair costs.
4. **Invest in High-Quality Construction:** Prioritize quality during the construction phase to minimize the risk of defects and failures that could lead to costly repairs or replacements down the line.

5. **Energy Efficiency and Sustainability:** Integrate energy-efficient technologies and sustainable practices to reduce operational costs, such as energy consumption and waste generation, over the lifecycle of the infrastructure.
6. **Innovative Materials and Technologies:** Utilize innovative materials, construction methods, and technologies that offer improved performance, longevity, and lower maintenance requirements.
7. **Standardisation and Modular Design:** Use standardised components and modular designs that allow for easier replacement, upgrades, and scalability without major disruptions or excessive costs.
8. **Risk Management:** Identify and manage risks that could impact the infrastructure's performance and lifespan. Implement risk mitigation strategies to avoid unexpected expenses.
9. **Lifecycle Planning:** Develop comprehensive and proactive lifecycle management plans that outline maintenance schedules, inspections, and upgrades based on the expected lifespan of different components.
10. **Effective Asset Management:** Implement robust asset management practices that track the condition, performance, and maintenance history of infrastructure components. This helps optimise maintenance efforts and allocate resources effectively.
11. **Public-Private Partnerships (PPPs):** Consider partnering with private sector entities to share risks and responsibilities in infrastructure development and management. PPPs can help optimize costs and improve efficiency.
12. **Community Engagement and Feedback:** Engage with the community and stakeholders to understand their needs and concerns. Develop service plans and agreed levels of service with the community in relation to critical infrastructure. Incorporate service level feedback into decision-making to ensure that the infrastructure remains relevant and well-maintained.
13. **Training and Workforce Development:** Invest in training programs to ensure that the workforce has the necessary skills to operate, maintain, and repair the infrastructure effectively.
14. **Use of Digital Technologies:** Embrace digital tools such as Building Information Modelling (BIM), Digital Twins, Internet of Things (IoT) sensors, and data analytics to monitor and optimize infrastructure performance and maintenance.
15. **Long-Term Funding and Financing:** Establish sustainable funding mechanisms that account for ongoing maintenance and replacement needs over the critical infrastructure's lifecycle.

By adopting these strategies and taking a holistic approach to infrastructure planning, construction, and management, stakeholders can significantly reduce lifecycle costs while maintaining the reliability, functionality, and resilience of critical infrastructure systems.

These principles are highlighted in the International Standards Organisation (ISO) 55000 – Asset Management series of Standards that provide guidance and specific information on the development of a Strategic Asset Management Plan (SAMP). The SAMP incorporates

legislative and policy requirements, infrastructure asset objectives, a decision-making framework, asset information and documented strategic outcomes and produces an infrastructure project plan.

It is strongly recommended that the ISO 55000 series Asset Management Standards be adopted by the New Zealand government as the process to strengthen the resilience of Aotearoa New Zealand's critical infrastructure system.

Smaller infrastructure custodians such as local government in regional and rural areas may not have as many resources to implement integrated asset management systems as part of the proposed nationally integrated framework. It is therefore important to note that the ISO 55000 series Asset Management standards are specifically written to allow for scalability without sacrificing outcomes. Therefore, any framework to better manage resilience for New Zealand's communities needs to be pragmatic, scalable and consistent.

Recent research indicates a decline in asset management and financial planning and reporting performance in the local government sector in Australia. This can lead to poor decisions made without the benefit of expert advice on asset and financial management of infrastructure.

Regarded as the global standard in infrastructure management, the International Infrastructure Management Manual (IIMM) provides valuable learnings for those who have a vital stewardship role in managing the investment in infrastructure on behalf of their community, customers or investors.

It is strongly recommended that the International Infrastructure Management Manual (IIMM) be adopted by the New Zealand government as the guidance document to strengthen the resilience of Aotearoa New Zealand's critical infrastructure system.

Lack of industry capability will impact on the timelines and quality outcomes of projects. Government investment in training and capacity building will allow for a greater ability to accelerate the delivery of the project pipeline. IPWEA's White Paper "[Best practice asset management of essential public infrastructure](#)" highlights the capacity and skills issues facing the industry and offers clear solutions to this issue.