

Recommendations to build resilience into essential infrastructure across Australia

Improve decision-making processes

Improve incentives

Improve capacity

6. Recommendations

Key points

This report makes three recommendations to build resilience into critical infrastructure across Australia:

1. **Improve infrastructure planning processes:** integrate resilience in government and industry decision-making by adopting the principles for resilience in infrastructure planning.
2. **Improve incentives:** prioritise policy changes and funding arrangements that ensure disaster resilience is considered and incorporated, where appropriate, into infrastructure planning.
3. **Improve capacity:** government and industry should work to strengthen the technical capacity of practitioners to identify, analyse and evaluate the costs and benefits of resilience options.

Decision-making processes for planning new infrastructure are complex, involving stakeholders with differing objectives, and the need to make trade-offs between objectives within budget constraints. Resilience is not consistently assessed during this process. The limitations currently lie in assessing disaster risks, profiling options for building greater resilience and measuring resilience benefits as part of the broader net benefits associated with infrastructure projects and revealed through detailed CBA. At least in part, this is because technical capabilities and incentives are not well established.

There is a clear economic imperative to consider resilience in the initial planning and approval processes for infrastructure investment. Government and industry incur significant costs in rebuilding infrastructure damaged by natural disasters – estimated at \$17 billion in present value terms between 2015 and 2050. There are also major flow-on impacts to businesses and communities that rely on infrastructure services disrupted due to natural disasters.

This report makes three recommendations that target specific gaps in the current decision-making framework.

These three recommendations are complementary. Action in all three areas – planning processes, incentives and capacity – is required to achieve the change that will benefit communities across Australia. This will require a joint effort from government and industry.

1 Improve infrastructure planning processes: integrate resilience in government and industry decision-making by adopting the principles for resilience in infrastructure planning

This report identifies that, while the importance of resilience is recognised in policies and strategies in Australia and internationally, there are limited tools and a lack of requirement to incorporate resilience into decisions about infrastructure, including as part of cost-benefit analysis (CBA). Only three of the 12 Australian CBA guidelines reviewed refer to resilience. With the exception of Queensland's guideline to measure the benefits of flood proofing transport infrastructure, there are no explicit guidelines for valuing the benefits of improved infrastructure resilience.

This report's case studies illustrate there is probably several cases in which considering resilience during the CBA for proposed infrastructure would result in changes to the specifications (including scope, location, design and/or materials). Evaluating options for resilience is an opportunity for investments to become more cost-effective and contribute to greater long-term community benefits. This finding is consistent for both major networks of infrastructure assets (such as telecommunications or electricity) and localised assets (such as a bridge).

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This suggests that Australia needs stronger requirements and tools to embed resilience in infrastructure decision-making and the relevant CBA processes. Notably, this presents opportunities to reduce the costs associated with natural disasters (expected to become more frequent and intense in future decades) by reducing the impacts on the infrastructure that underpins the economy.

The resilience principles presented in chapter five are designed to support decision-makers to consistently and adequately include resilience in planning and approval processes. The principles are:

1. Identify disaster risks
2. Apply robust methodologies for CBA
3. Coordinate, centralise and make available critical data and information
4. Strengthen approval processes
5. Embed ongoing monitoring of resilience.

This report recommends that all levels of government and industry adopt these principles to facilitate this shift. A consistent approach across all stakeholders will ensure resilience becomes a mainstream component of infrastructure investment decisions, improving the ability of these investments to provide essential services in Australia.

2 Improve incentives: prioritise policy changes and funding arrangements that ensure disaster resilience is considered and incorporated, where appropriate, into infrastructure planning

Building infrastructure with greater resilience is typically associated with higher up-front costs. In many cases, costs are borne by private investors while the benefits accrue to the community more broadly. This includes both the additional cost of building in resilience and the cost of undertaking an economic impact analysis to justify the benefits of doing so. Government should thus provide appropriate incentives for business to consider resilience in the investment planning process.

Even government-funded infrastructure projects have competing requirements and priorities, including budgetary constraints. Strong leadership, coordination and incentives are therefore required to ensure project appraisal processes adequately consider disaster risks and identify cost-effective opportunities for resilience.

This report recommends that all levels of government update project appraisal frameworks to include criteria to demonstrate appropriate consideration of resilience. By adding these criteria, governments will be able to better demonstrate value for money and ensure infrastructure meets the needs of the Australian community. Industry will be motivated to consider resilience, despite the higher costs of doing so. Where appropriate, governments should also consider funding mechanisms that recognise the distribution of resilience benefits to the community.

As advocated in *Building our Nation's Resilience to Natural Disasters* (2013), a National Resilience Advisor in the Department of Prime Minister and Cabinet could take a leadership and advocacy role in removing barriers to resilience requirements. The advisor could drive coordination between jurisdictions and accelerate progress towards building disaster resilience.

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3 Improve capacity: government and industry should work to strengthen the technical capacity of practitioners to identify, analyse and evaluate the costs and benefits of resilience options

Significant improvements in technical capacity are required to embed resilience in infrastructure decision-making. Sophisticated and data-intensive analysis is required to model natural disaster risks in local areas, and quantify the benefits of resilient infrastructure using CBA.

This report has found limited tertiary training that covers resilience in infrastructure planning, design and appraisal. It appears Australia is underinvesting in the education necessary to ensure it is well placed to respond to and plan for natural disasters.

A long-term shift in awareness and capacity is required, through educating and upskilling government, business and community decision-makers. **To this end, this report recommends investing in resilience education at the tertiary level and revising existing tools and guidelines to ensure practitioners consider resilience in infrastructure planning and CBA.**

Applying the resilience principles requires access to the necessary data, information, tools and systems. However, as established in *Building an Open Platform for Natural Disaster Resilience Decisions* (2014), a number of barriers prevent practitioners from evaluating disaster risks and their implications. That paper called for a national open data platform to be established to facilitate greater access to information needed to assess disaster risks. Where data cannot be provided on an open platform, efforts should be made to improve the transparency and availability of relevant data and research.

Concluding remarks

This report extends the research program of the *Australian Business Roundtable for Disaster Resilience & Safer Communities*, demonstrating why and how resilience should be included in decision-making processes for new investments in infrastructure.

This report's recommendations address the gaps in the current decision-making environment – adopting principles for embedding resilience in infrastructure decision-making, improving incentives to apply these principles, and investing in capacity building to ensure these principles can be applied.

This reaffirms the recommendations made in *Building our Nation's Resilience to Natural Disasters* (2013) and *Building an Open Platform for Natural Disaster Resilience Decisions* (2014), particularly in terms of the need for national coordination of pre-disaster resilience, an efficient and open platform for foundational data, the removal of barriers to accessing data and research, and the prioritisation of investments in resilience. Implementing this report's recommendations will also reduce the significant social impacts that natural disasters impose on communities, as quantified in *The Economic Cost of the Social Impact of Natural Disasters* (2016).

Natural disasters are expected to continue to affect Australia and our way of life over the next century and beyond. There remains potential to ensure our significant investment in new and replacement infrastructure takes these disaster risks into account and exploits opportunities for greater resilience. Embedding resilience in infrastructure decision-making will improve the cost-effectiveness of infrastructure spending and, more importantly, mitigate the devastating and costly impacts of disasters for businesses and communities that depend on critical infrastructure services.