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Building resilient transport: Queensland–Southeast Asia knowledge exchange

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Southeast Asia is projected to face continued warming, with average temperatures rising by up to 5 °C by the end of the century under a business-as-usual scenario. Rising sea levels, heavier rainfall, and more destructive storms will compound risks. Increased precipitation is expected to result in increased risk of flooding, landslides, and erosion, threatening livelihoods and infrastructure, with rising sea levels particularly impacting coastal areas.¹

Queensland, Australia's most disaster-prone state, regularly experiences floods, droughts, heatwaves, and bushfires.² Australia's first National Climate Risk Assessment, released in September 2025, modelled three warming scenarios—1.5°C, 2.0°C, and 3.0°C. Under the most severe scenario, sea levels could rise by half a metre by 2090, with 18 of the 20 most at-risk regions located in Queensland. A large share of the state's population lives in high-risk areas, with North Queensland communities particularly exposed to multiple hazards.³

The Queensland Reconstruction Authority (QRA), established in 2011 following a spate of unprecedented disaster events, is the lead agency responsible for disaster recovery, resilience, and flood risk management policy in Queensland. Since then, the state has experienced a significant increase in the frequency and severity of disaster events, with 2025 being one of the worst years on record—marked by three major rainfall and flooding events that impacted all corners of Queensland. To assist communities, QRA has developed a comprehensive governance and funding framework that prioritises long-term disaster and climate resilience. The effectiveness of having a central coordinating agency like QRA has drawn national attention, with other Australian states now seeking to replicate its model to strengthen their own recovery and resilience efforts.

This brief outlines some lessons and insights from QRA which are relevant for Southeast Asian infrastructure agencies, particularly in the transport sector, seeking to embed resilience more systematically into governance, planning, and budgeting systems.

¹ Intergovernmental Panel on Climate Change (IPCC) Working Group II 6th Assessment Report, [Asia](#) [Fact sheet], IPCC, 2022.

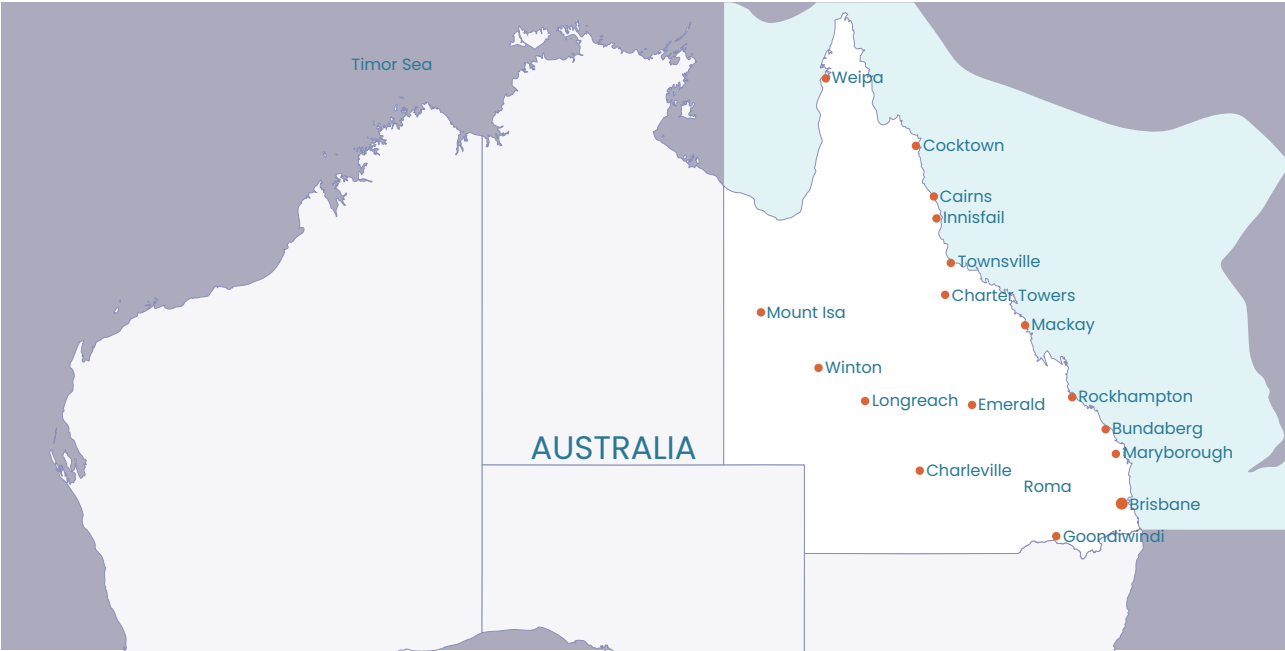
² Queensland Government, [Queensland Climate Futures](#) [Fact sheet], 2024.

³ Australian Climate Service, [National Climate Risk Assessment](#) [Report], ACS, 2025.

Recurrent hazards in Queensland and impacts on infrastructure

Queensland, located in northeastern Australia, is the country’s second-largest state and encompasses the wettest and most tropical region of the continent (see Figure 1).

Figure 1: Map of Queensland



Source: Queensland Government

The state frequently experiences extreme weather events and climate change is likely to exacerbate their frequency and severity. Over time, these impacts, including rising sea levels, increased risk of storm tide inundation, coastal flooding and increased coastal erosion, will place growing pressure on infrastructure along the highly developed Southeast coast.

Rural and remote communities, including Aboriginal and Torres Strait Islander communities (around 4.6% of Queensland’s population), face heightened risks of isolation due to their geographic location and limited access to infrastructure.⁴

Sea level rise, more intense flooding and stronger tropical cyclones are also projected to significantly increase clean-up, recovery, and asset maintenance costs (see Table 1).⁵

Table 1: Types of climate hazards facing Queensland and potential impacts on infrastructure

Sector	Climate hazards	Potential impacts
Human settlements and infrastructure	• Sea level rise • Increased extreme fire weather • More heatwaves and extreme heat events • Increased tropical cyclone intensity • Flooding	• Inundation, erosion and infrastructure damage along the coastline • Increased maintenance and recovery costs • Increased disruption to services • Increased energy usage

Source: Queensland Government

⁴ Australian Bureau of Statistics, [Queensland Aboriginal and Torres Strait Islander population summary](#) [website], 2022, accessed 29 September 2025.
⁵ Queensland Government, [Queensland climate futures](#) [Fact sheet], 2024.

Role of the Queensland Reconstruction Authority in Queensland

Australia's system of government involves three levels, Commonwealth (federal), state, and local government, each of which has a role to play in infrastructure and the provision of services:

- 1 Commonwealth** (federal), known also as the Australian Government, is responsible for national issues like foreign affairs, defence, and shaping national policies.
- 2 State and Territory Governments** (e.g. Queensland) are responsible for state infrastructure, including roads, hospitals, emergency services, and housing.
- 3 Local councils** are responsible for issues including local roads, rubbish collection, and town planning.

The floods and storms that impacted Queensland in the summer of 2010–2011⁶ exposed some issues and inefficiencies with multiple state government agencies involved in various parts of response and recovery, without a clear coordinating authority. This also limits the ability to think and plan strategically for the long-term. QRA's mandate includes coordinating and managing reconstruction, recovery and resilience policy after disasters. It is also charged with disaster mitigation (risk reduction), working with Commonwealth, state and local government partners to deliver best practice administration of public reconstruction and resilience funds. Since its inception, QRA has helped Queensland recover from at least 135 disaster events.⁷

What makes QRA unique in Australia:

- **Legislative authority** – Clear statutory powers, including over development approvals in reconstruction areas, provide consistency and predictability.
- **Dedicated resilience funding** – Mechanisms such as the Betterment Fund enable investment in upgrading resilience rather than simple replacement of affected assets and infrastructure, helping to reduce future costs should those assets be re-impacted.
- **Centralised yet collaborative approach** – QRA coordinates recovery at the state level while working in partnership with local governments, supporting them to access funding, assess risks, and plan effectively.
- **Data-driven prioritisation** – Advanced mapping and analytics identify repeat-damage sites and cost hotspots, guiding smarter investment in resilient infrastructure.
- **Integrated resilience strategies** – Beyond administering funds, QRA develops policy, undertakes hazard and risk management, and leads regional resilience planning.

QRA's Strategic Plan

The Strategic Plan 2025–2029 outlines QRA's vision, purpose, organisational objectives, strategies, outcomes and performance indicators.⁸ It has four main principles:



- Principle 1 – Lead state recovery under a changing climate
- Principle 2 – Strengthen resilience through preparedness
- Principle 3 – Invest in betterment and disaster risk reduction for resilience
- Principle 4 – A capable and empowered team

⁶ '2010–2011 floods' – from November 2010 to January 2011, floods affected 75% of Queensland, killing 33 people (three never recovered) and prompting the evacuation of 5,900 people from 3,600 homes. Around 28,000 homes required rebuilding or major repairs. The disaster inundated 3,572 businesses, caused A\$4 billion in economic losses, damaged 19,000 km of roads, disrupted three major ports, and left over 28% of the rail network twisted or displaced. Australian Disaster Resilience Knowledge Hub, [Queensland and Brisbane 2010/11 Floods](#) [website], n.d., accessed 23 September 2025.

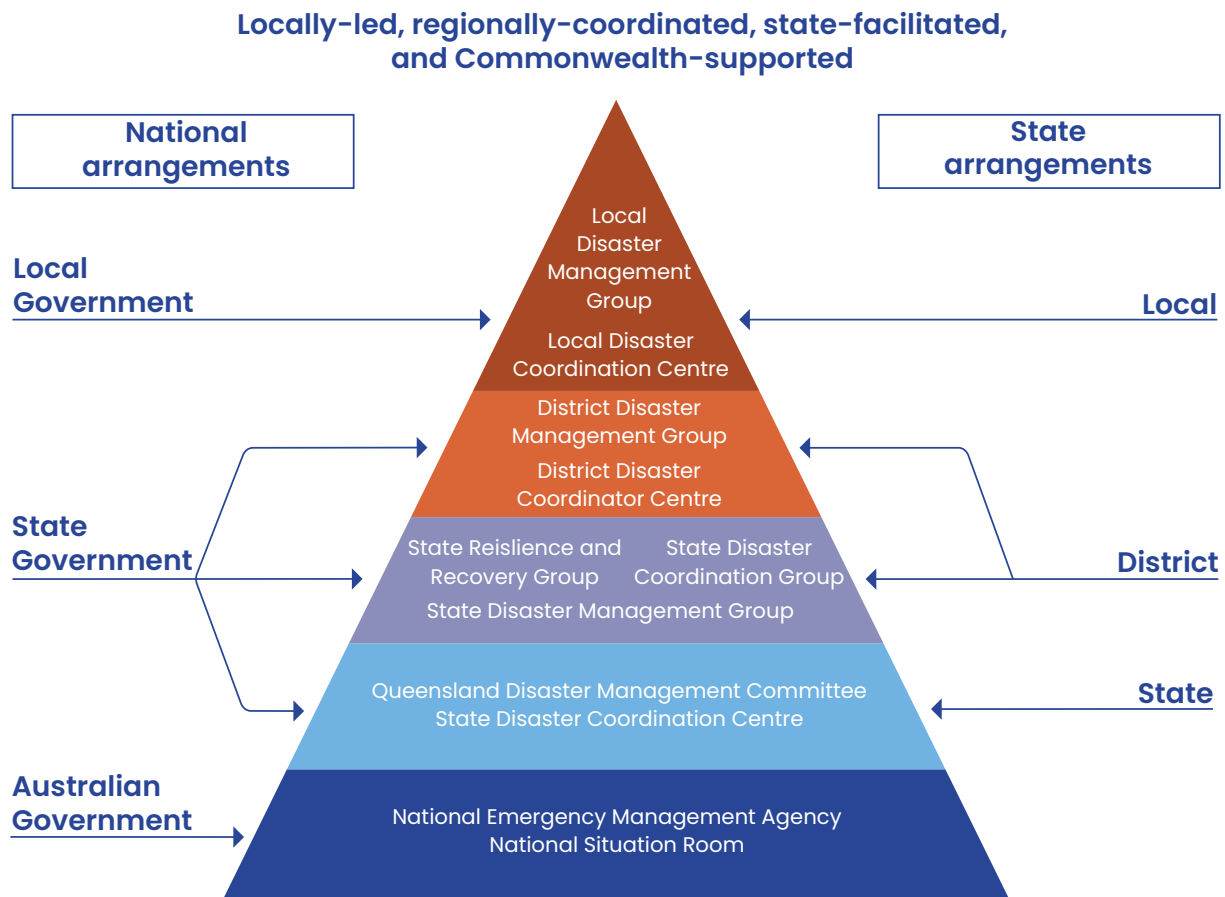
⁷ QRA, 2025

⁸ Queensland Reconstruction Authority (QRA), [Queensland Reconstruction Authority Strategic Plan 2025–29](#), QRA, 2025.

Queensland Reconstruction Authority's recovery and resilience governance model

QRA's recovery and resilience governance model can be described as locally-led, regionally-coordinated, state-facilitated and nationally-supported (see Figure 2). It is also aligned with the Sendai Framework for Disaster Risk Reduction 2015–2030, the global UN framework for disaster risk reduction.

Figure 2: Queensland's recovery and resilience governance model



Source: QRA

Some of its main policies include:

Queensland Recovery Plan

The Queensland Recovery Plan outlines recovery requirements for operations, planning and arrangements at the local, district and state level. It drives a collaborative and coordinated approach across all functions of recovery, all levels of government and the whole community, ensuring operations are scaled appropriately to the severity of a disaster.⁹

The plan also sets out the arrangements for transitioning from response to recovery, clarifying the roles and responsibilities of the **State Recovery Policy and Planning Coordinator** and the **State Recovery Coordinator** and the **Functional Recovery and Resilience Groups** – to assist disaster impacted communities achieve optimum recovery outcomes. Functional Recovery and Resilience Groups support communities across the five functional lines of recovery: (1) Human and social, (2) Economic, (3) Environment, (4) Building, and (5) Roads and transport.

Importantly, the Queensland Recovery Plan emphasises building resilience through recovery. It provides stakeholders with information and guidance on the governance, planning and operational issues relating to disaster recovery for all hazards.

⁹ Queensland Reconstruction Authority (QRA), [Queensland Recovery Plan](#), QRA, 2023.

Queensland Strategy for Disaster Resilience

The Queensland Strategy for Disaster Resilience 2022–2027 guides how the Queensland Government collaboratively delivers disaster resilience commitments and actions, based on local and regional needs, to strengthen community resilience.¹⁰

QRA leads statewide hazard and risk management functions including prevention, mitigation and preparedness activities. Its resilience-focused role includes:

- Coordinating the development and implementation of whole-of-government policies to manage disaster risk
- Providing advice to support policies that promote more resilient buildings, infrastructure, and communities

Risks are identified not only through historical hazard profiles but also using climate forecasting and physical asset vulnerability assessments, undertaken in collaboration with the Queensland Department of Transport and Main Roads (TMR) and local governments. This approach ensures local knowledge is embedded, drawing on frameworks such as regional resilience strategies and local resilience action plans.

Regional Resilience Strategies and Resilience Actions Plans

In recent years, QRA has rolled out 14 Regional Resilience Strategies across Queensland, developed through a co-design and place-based approach that empowers local governments to tailor strategies to their communities. This process recognises that communities are best placed to understand their own risks and contribute local knowledge to address them.

These strategies support Australia's commitment to the global Sendai Framework for Disaster Risk Reduction and align with Queensland's statewide resilience goals. In addition, all 77 councils across the state have Local Resilience Action Plans in place, supported by QRA's Regional Liaison Officers and Resilience and Recovery Officers.

Frameworks and funding mechanisms for recovery and resilience in Queensland

Key principles of assistance

Queensland's resilience and recovery funding system is built on the principle that recovery and resilience are shared responsibilities across all levels of government involving Commonwealth, state, and local governments. Assistance is designed to complement local initiative rather than replacing it. This ensures that communities are supported while still encouraged to plan and mitigate risks themselves. Funding is also guided by principles of equitable distribution, sustainability, and minimising the burden on taxpayers through cost-sharing arrangements.



QRA and Thailand Ministry of Transport representatives exchange knowledge on resilience and recovery in July 2025 in Bangkok, Thailand. Source: P4I

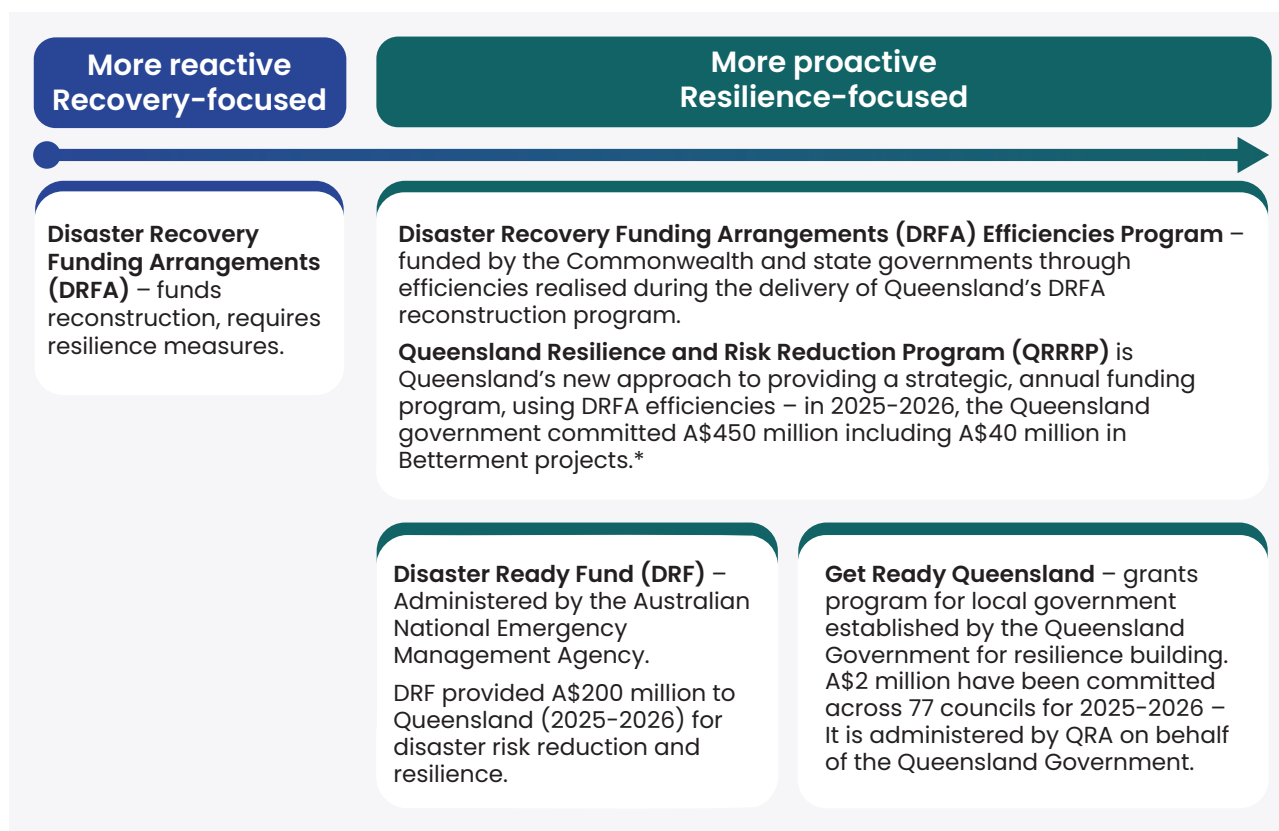
¹⁰ Queensland Reconstruction Authority (QRA), [Queensland Strategy for Disaster Resilience 2022–2027](#), QRA, 2022.

Disaster Recovery Funding Arrangements

The Disaster Recovery Funding Arrangements (DRFA) is a mechanism through which the Australian Government provides funding to states (like Queensland) and territories to share the financial burden of responding to a disaster. Acting as a financial safety net, the DRFA covers eligible relief and recovery expenditures following disasters. While its primary focus is on recovery, the DRFA also requires resilience measures to be embedded into reconstruction, helping reduce the risk of repeated damage. Queensland's councils and partner organisations can also make use of other funding mechanisms as described in Figure 3.

Over recent years, Queensland has significantly evolved its funding approach, allocating a growing proportion of resources towards proactive resilience measures rather than traditional reactive post-disaster recovery. This is demonstrated by increased investment in strategic programs such as the recently announced Queensland Resilience and Risk Reduction Program (QRRRP), which leverages savings from past recovery efforts to finance risk reduction and resilience-building projects such as proactive Betterment projects.

Figure 3: Queensland's recovery and resilience governance model



Source: QRA

*Note: More information about Betterment projects is provided below.

Queensland's Betterment Program

Queensland has progressively shifted from a reactive to a proactive approach to resilience. The Betterment Program, launched in 2013, is a strong example of this shift. The program enables local governments and state agencies to rebuild essential public assets such as roads, bridges, and floodways, to a more resilient standard, helping them better withstand future disasters. Improvements may include stabilising low-lying roads to reduce erosion and scouring, upgrading drainage structures to increase capacity, or replacing gravel with reinforced concrete to improve resilience.

Since its launch, more than 750 Betterment projects have been delivered across Queensland, supported by over A\$533 million investment. These projects have been exposed to 44 events, with 79 percent suffering no or only minor damage. For projects that were re-impacted, an initial investment of A\$244 million has generated over A\$988 million in avoided reconstruction costs – a return of more than four dollars for every one invested (see Figure 4 for some Betterment project examples).

Figure 4: Before and after views of Betterment projects across Queensland



Source: QRA

Quantifying direct and indirect benefits of Betterment: the SAVi tool

Developed in partnership between the International Institute for Sustainable Development (IISD) and QRA, the Sustainable Asset Valuation initiative (SAVi) is a cost-benefit assessment tool that enables governments and investors to make informed decisions on financing sustainable infrastructure. By integrating a range of direct and indirect costs and benefits from infrastructure projects with traditional project finance modelling, SAVi provides a comprehensive evaluation and comparison of the total value of Betterment projects. Unlike traditional cost-benefit analysis, SAVi quantifies in financial terms the externalities generated directly by projects, revealing co-benefits and trade-offs that might otherwise remain hidden, thereby supporting more risk-informed infrastructure development.

QRA has explored applying SAVi to its Betterment Program, with a focus on road infrastructure and the impacts of closures. To date, the tool has been used retrospectively to assess the economic benefits of Betterment investments. SAVi relies on well-developed, localised datasets to quantify the full value of investing in Betterment projects, including the wider socio-economic and environmental costs avoided and benefits gained from more resilient infrastructure.

Applying SAVi to the Aurukun Access Road Betterment

The Aurukun Access Road in remote North Queensland was a gravel road that provided the only road link to and from the Aurukun community. It was flood-damaged four times from 2010 to 2013.

In 2013, Betterment funding was used to seal a flood-prone 10-kilometer section, which has since withstood 10 flood events without repairs. SAVi assessed the project's wider benefits using 15 indicators related to transport, economy, mental health, and access to services. The analysis estimated daily savings of A\$29,228 – making it a clear case for investing in more resilient infrastructure.¹¹

Overall, Betterment projects have demonstrated major cost savings, with SAVi providing strong support for justifying future Betterment investments. Recent floods showed millions in avoided reconstruction costs, stronger connectivity for communities, and increased public confidence. By allocating A\$40 million in 2025–2026 for Betterment through the Queensland Resilience and Risk Reduction Program, Queensland has institutionalised resilience integration in infrastructure planning.

Peer-to-peer experience sharing

Queensland's experience demonstrates the importance of integrating resilience through governance, funding, and locally-led approaches. Southeast Asian countries facing similar climate challenges have the opportunity to adapt these strategies in ways that respect and build upon local knowledge, governance structures, and community priorities. Given the region's diverse governance systems, spanning national, provincial, and municipal levels, QRA's approach could be tailored to fit more decentralised or multi-level administrative frameworks in Southeast Asian countries. Additionally, the emphasis Queensland places on equity by addressing the needs of vulnerable, remote, and indigenous communities aligns well with the varied social contexts across the region.

Rather than prescribing solutions, QRA's approach, along with supporting analysis tools like SAVi, offers a starting point for dialogue and co-development. The model recognises that resilience must be proactively promoted by governments and shaped by those who live with the risks.

Key principles for governments seeking to strengthen infrastructure resilience include:

- **Build a compelling narrative that justifies resilient investment:** Boosting resilient investment relies on buy-in from key decision-makers within government, and a clear justification (e.g., economic benefits to be gained) is a key enabler to this.
- **Governance clarity matters:** Resilience should be treated as a shared responsibility, with clearly defined roles and accountabilities across agencies.
- **Link recovery funding to resilience funding:** Programs focused on the 'betterment' of disaster-impacted infrastructure demonstrate how recovery savings can be leveraged to mitigate future risk.
- **Embed resilience in budgeting:** Investment frameworks and budget processes should incorporate resilience objectives and indicators.
- **Base decisions on evidence:** Tools like SAVi, adapted to local contexts, can help build strong, data-driven business cases for resilient investments to be reflected in national priorities. Strengthening data quality and availability will be crucial to support this evidence.

¹¹ Queensland Reconstruction Authority, [Betterment: Aurukun Access Road](#) [website]. QRA, n.d., accessed 15 September 2025.



Ho Chi Minh city, Vietnam. Source: Shutterstock

About this document

This insights brief summarises information presented by the Queensland Reconstruction Authority (QRA) at the Resilience and Recovery Program Knowledge Sharing Session on 7 July 2025 in Bangkok, Thailand. The session, part of Partnerships for Infrastructure's ongoing collaboration with Thailand's Ministry of Transport, explored how new approaches and tools like SAVi can strengthen resilience in the transport sector in Thailand.

Acknowledgement

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Partnerships for Infrastructure acknowledges Aboriginal and Torres Strait Islander peoples as the traditional custodians of Country throughout Australia, and we pay our respects to Elders past and present. P4I also recognises early connections between Southeast Asia and the First Nations peoples of Australia.

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