



Australian Government

National Emergency Management Agency

Submission to the Inquiry into the implications of severe weather events on the national regional, rural and remote road network

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Introduction

The National Emergency Management Agency (NEMA) is pleased to contribute a submission to the *Inquiry into the implications of severe weather events on the national regional, rural and remote road network*. The submission primarily focusses on the recognised impacts of disasters of road networks, ongoing challenges, and lines of effort moving forward.

National Emergency Management Agency

On 1 September 2022, NEMA was established to provide end-to-end oversight on disaster risk reduction, prevention, preparedness, response and recovery in Australia. Formed through a merger of the former National Recovery and Resilience Agency and Emergency Management Australia, NEMA operates across the entire disaster management continuum. NEMA is working to ensure that Australia is more resilient to disasters by leading national disaster risk and emergency management efforts, coordination and oversight, in line with the key doctrine such as the Australian Government Crisis Management Framework and National Disaster Risk Reduction Framework.

Australia's risk landscape is increasingly complex

Australia's risk landscape is ever-changing and increasingly complex. The decisions made about where to build, work, live and invest can mitigate exposure, or conversely can create new risk. With hazard risk and exposure increasing across the country, there is a growing need for investment in disaster risk reduction, and effective decision-making to reduce risk and improve the resilience of communities.

Hazards are increasing in frequency and/or intensity as a result of climate change, and human action – and inaction – is further exacerbating the impacts of these risks on communities. This increasing risk and exposure interacts with a community's vulnerabilities, impacting the ability for Australians to recover from disasters and effectively prepare against future hazard events.

Australia is experiencing an increased frequency, severity, and impact of climate-influenced disasters. The seventh biennial *State of the Climate 2022* report shows Australia is experiencing ongoing, long-term climate change, and has warmed on average by 1.47 (± 0.24) degrees since 1910.¹ The report states that climate change interacts with underlying natural variability, and associated with this, increased intensity and frequency of extreme weather, including compound events where multiple extreme events occur together. Climate change can increase disaster risk in a variety of ways, including by altering the frequency and intensity of natural hazards, affecting vulnerability to natural hazards, and changing exposure patterns. Consecutive and compounding natural hazards will place increasing stress on existing emergency management arrangements, at all levels of government. Reducing disaster risk is essential to increasing our resilience now, and into the future. The frequency and intensity of natural hazards are forecast to increase both in Australia and globally.

On 6 October 2021, Deloitte released its *Special report: update to the economic costs of natural disasters in Australia*, which was commissioned by the Australian Business Roundtable for Disaster Resilience and Safer Communities.² It estimated disasters cost the Australian economy \$38 billion per year (on average), and by 2060, costs will rise to \$73 billion per year on a low-emissions trajectory and \$94 billion on a high-emissions trajectory. This increase in more frequent and severe weather events will continue to have a greater economic impact.

¹ The Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Bureau of Meteorology (BoM), *State of the Climate 2022*, CSIRO and BoM, Australian Government, 2022.

² Deloitte Access Economics, *Special report: Update to the economic costs of natural disasters in Australia*, Deloitte Access Economics, Sydney, 2021.

Road infrastructure across the disaster continuum

Critical infrastructure such as roads must be resilient to disasters to support all aspects of community life, and local, regional and national economies. Road infrastructure must recognise the diverse nature of Australian communities, and reflect how requirements differ across metropolitan, coastal, island, regional, rural and remote locations. Road infrastructure supports connected communities, however unsealed roads present a significant vulnerability for communities nationally. With almost 63% of Australia's road network remaining unsealed this vulnerability can increase the risk faced throughout all stages of a disaster.³ With more than three-quarters of Australia's road network under the responsibility of local governments,⁴ capacity and capability gaps can impact the ability to maintain and construct safer road networks, generating additional vulnerability and highlighting the different needs and capacities of communities.

Since January 2022, there have been 26 flood events in 308 Local Government Areas (LGAs) across the nation. Alongside road closures associated with these events, flooding has also significantly accelerated the deterioration of road conditions. This has been seen across the East Coast where the nationally significant Hume, Newell, Calder and the Western highways have been impacted. Remote corridors, such as the Great Northern Highway and Gibb River Road in the Kimberly, and the Victoria and Barkly Highways in the Northern Territory have also been damaged by recent events. This impacts on supply chains and puts pressure on the cost of essential supplies, with freight operators and retailers in many cases having to pass this cost onto customers.

In a disaster, access to safe road networks can play a vital role in the evacuation and safety of communities. Immediately following an event, road infrastructure plays a key part in the delivery of essential supplies, machinery, and recovery personnel. In the aftermath of a disaster, roads need to be restored quickly and to appropriate standards to enable essential traffic access to support the immediate recovery of a community. This is particularly important in regional, rural and remote Australia, where resilient road networks are core components of community safety, connection, and economy. Disruptions can have a more pronounced impact on communities where there are fewer alternative transportation options. Communities which are reliant on transport infrastructure and key freight routes for core industries can be particularly impacted at this crucial time.

Further, road infrastructure degradation can compound the impacts of a range of other disasters. For example, flooding in the Alpine Shire in Victoria has contributed to deteriorated road conditions and the closing of the Bogong High Plains Road (BHP Road). With other roads inaccessible during winter months, the ongoing closures of the BHP Road have introduced concerns that the alpine area will be inaccessible for the 2023 ski season.⁵ In the past five years, businesses in this area have missed two green seasons and three snow seasons from a combination of disaster events, including bushfires, flooding, and closures relating to the Covid-19 pandemic.

Sustained damage to road networks can have an ongoing impact on the ability for communities and economies to recover, and their ability to reconnect and stay connected. In regional, rural and remote Australia, where some communities already face isolation and enhanced supply chain concerns, the repercussions can last months or even years following a disaster event.

³ Australian Road Research Board (ARRB), [Unsealed Roads: Best Practice Guide](#), ARRB, 2020. (Note: Report supported by the Department of Infrastructure, Transport, Regional Development and Communications).

⁴ Ibid.

⁵ [Falls Creek: Portrait of a town isolated by landslide \(ampproject.org\)](#) B Preiss, 'Falls Creek misses another key holiday season as landslide continues to isolate town', *The Age*, 19 February 2023, accessed 2 March 2023.

NEMA's role in addressing disaster impacts to road networks

Under Australia's constitutional arrangements, state and territory governments have primary responsibility for emergency management within their jurisdiction. States and territories are the first responders to any incident that occurs within their jurisdiction and have primary responsibility for the protection of life, property and the environment. However, NEMA recognises that states, territories, and local governments are often constrained in addressing large-scale disaster impacts, and may require assistance from the Australian Government. Examples of such assistance is provided below.

Recovery and the Disaster Recovery Funding Arrangements

The Disaster Recovery Funding Arrangements (DRFA), managed by NEMA, is the vehicle through which the Australian Government provides financial support to states and territories following a disaster event. This support enables jurisdictions to provide assistance to individuals and communities to help them recover. This financial contribution is delivered through a number of assistance measures including reconstruction of essential public assets, such as roads and bridges. Since 2010-11, the Australian Government has provided more than \$13 billion to states and territories through the DRFA.

Application of DRFA for road infrastructure

The DRFA works on a Category A through to Category D basis, representing different levels and types of support the Australian Government can provide. Category B of the DRFA makes assistance available for the restoration of damaged essential public assets, such as roads, bridges, and stormwater infrastructure. The restoration or replacement of these essential public assets and critical infrastructure constitutes a significant proportion of the funding provided under the DRFA. NEMA also works with jurisdictions to consider betterment as part of the development of recovery funding packages.

Under Category B, states and territories can claim the cost of restoring damaged essential public assets to at least their pre-disaster standard, which is considered to be the condition of the essential public asset and its level of functionality (or utility) prior to the disaster. The assistance also allows the adoption of alternative approaches to the reconstruction of damaged assets, including approaches to facilitate improvements in disaster resilience. This includes through:

- applying modern building, design, and construction standards;
- using contemporary construction methodologies and building materials;
- adopting a more appropriate type of asset, rather than a like-for-like replacement; and
- relocating damaged assets to a more suitable site.

States and territories also have the opportunity to seek assistance under Category D of the DRFA which allows for the betterment of essential public assets to increase their resilience to future hazards, and requires the state or territory to seek the agreement of the Prime Minister.

NEMA strongly encourages states and territories to consider betterment when making DRFA requests, to ensure risk reduction and resilience is built into the recovery process.

Only Queensland and New South Wales (NSW) have accessed Category D of the DRFA for this purpose, to date. Following the East Coast floods throughout 2022, NSW and the Commonwealth have jointly-funded a \$312.5 million Regional Road and Transport Recovery Package to help rebuild damaged roads and transport infrastructure for 26 disaster-declared councils in Northern NSW. On 27 February 2023, 57 projects were announced as successful under this funding package. This funding will allow for roads and transport infrastructure to not only be rebuilt, but to be improved to withstand future severe weather events. Further information about the Package, including the full list of successful projects, is available here: <https://nswroads.work/rrtrp>.

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Embedding betterment within projects is a proven way to increase the resilience of infrastructure, with benefits extending to communities and the economy. The Queensland Reconstruction Authority found that of 480 betterment projects completed, 375 were subsequently impacted 1016 times across 40 events. Of those subsequently impacted, 81% suffered only minor superficial damage, or no damage at all.⁶ From an investment of \$137 million, the estimated avoided restoration costs associated with these projects is already \$391 million. Further information on the Queensland Betterment Funds can be found here: <https://www.qra.qld.gov.au/betterment>. Jurisdictions are encouraged to engage with the Government to explore opportunities for betterment.

Reviews of the DRFA

The DRFA is currently being reviewed to address recommendations of the former Council of Australian Governments, the Royal Commission into National Natural Disaster Arrangements, and complementary to the Australian Government's wider Independent Review into Australia's disaster funding arrangements led by Andrew Colvin AO APM.

The DRFA Review is a collaborative work program between Australian Governments. A key component of the DRFA Review is the development of new national guidance on Category B public asset restoration and Category D betterment to facilitate greater investment in disaster resilient infrastructure. Program guidelines for a pre-agreed 'off-the-shelf' recovery package on Infrastructure Betterment have also been developed and were endorsed by the National Emergency Management Ministers' Meeting in late 2022. The scope of the DRFA Review has also been expanded to look at how the arrangements could be used to generate greater investment in community resilience more broadly.

The Independent Review will consider whether the DRFA, alongside other Commonwealth disaster funding, is fit-for-purpose and effective in the face of increasingly frequent and more severe disasters. The final report for this review is expected to be provided to Government in April 2024.

National Coordination Mechanism (NCM)

The National Coordination Mechanism (NCM) forms part of the Australian Government Crisis Management Framework, ensuring the Government can bring together the relevant representatives of both government and non-government organisations to coordinate, communicate and collaborate during responses to crises.

On 15 December 2022, NEMA convened an NCM meeting to discuss road repair, reconstruction and recovery from recent flooding damage. The purpose of this NCM was to understand the national situation on immediate and longer term emergency road repairs and reconstruction issues, and discuss coordinating this work.

On 17 January 2023, NEMA Coordinator-General Brendan Moon AM wrote to state and territory counterparts to iterate the agreed lines of effort to expedite the delivery of road reconstruction, and to highlight the opportunities to integrate betterment into the recovery work. These lines of effort are:

1. prioritising works on the functionality of key transport routes;
2. state, territory, and local governments taking a multi-disciplinary approach to mobilising resources to support reconstruction;
3. commencing planning work to ensure transport routes that support agriculture, industry, and remote communities are prioritised for reconstruction; and
4. engaging in community messaging campaigns – across a state, regional, and local level – to outline the size and scale of a disaster event, and communicate how and when key reconstruction activities will occur.

⁶ Queensland Reconstruction Authority (QRA), [Queensland Betterment Programs](#), QRA, Queensland Government, 2022.

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Investment in Disaster Risk Reduction

Investing in disaster risk reduction is a key way to reduce risk and build resilience. Across NEMA, and the Australian Government more broadly, investment that considers disaster risk and climate resilience is a key way to embed resilience-building within communities.

As outlined, investment into betterment is a key way to build future resilience against hazards and disaster events.

NEMA also administers a range of other risk reduction programs that support resilient infrastructure outcomes. For example, the Australian Government has established the Disaster Ready Fund (DRF) which will provide up to \$200 million per year, over five years, for projects that help reduce disaster risk and build community resilience around Australia. This funding is expected to be matched by states and territories, with projects to commence as soon as possible from 1 July 2023. Funding under the DRF Round One Guidelines could support both infrastructure and systemic risk reduction initiatives. This could include road infrastructure works that have the primary purpose of reducing community exposure to risk, harm and/or severity of a natural hazard's impacts. More broadly, disaster risk reduction and resilience building initiatives under the DRF will complement other road improvements.

Investment into disaster risk reduction and roads is not limited to NEMA. The Australian Government's commitment to programs such as the Remote Roads Upgrade Pilot Program and Local Roads and Community Infrastructure Program demonstrates action to deliver priority road infrastructure projects, particularly in regional and remote areas. Government commitment to Phase Four of the Local Roads and Community Infrastructure Program brings total funding to \$3.25 billion, and will prioritise road projects with councils able to access funding from 1 July 2023.

Comments against Terms of Reference

NEMA provides comments below against the lines of inquiry in the Terms of Reference to complement the aforementioned information on road networks. NEMA has identified areas that the Committee may wish to explore further, particularly where the levers for influencing these lines of inquiry sit with other organisations or levels of government.

1. Road engineering and construction standards required to enhance the resiliency of future road construction

NEMA supports the Committee's focus on road construction standards to increase future resilience, as increased standards can improve the disaster resilience of key critical infrastructure.

NEMA recommends the Committee consider the importance of increased road engineering and construction standards as they apply to improvements and routine maintenance of roads, rather than exclusively for future road construction. The purpose of this is to ensure that we address existing legacy risk (i.e. the risks created from previous decisions or standards that are no longer appropriate for current risk levels) while also seeking to not create new risks. NEMA notes any standards should be tested for future climate resilience, drawing on the work of the Australian Buildings Code Board and the National Construction Code as a guide. Nature-based solutions can act as infrastructure and can help conventional infrastructure perform better and longer.

NEMA supports the increased use of appropriate nature-based solutions to protect roads from excess water where possible. Nature-based solutions can increase road safety and durability whilst reducing disaster risks, for example, restoring or protecting wetlands and floodplains can reduce flooding of homes, roads, schools, and other nearby assets all at once.⁷

2. Identification of climate resilient corridors suitable for future road construction projects

In October 2022, the Australian Government committed to scoping a National Climate Risk Assessment and funded the development of enhanced national climate scenarios both of which are intended to

⁷ The White House [Opportunities to Accelerate nature-Based Solution: A Roadmap for Climate Progress, Thriving Nature, Equity, & Prosperity](#), The White House, United States of America Federal Government, 2022.



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inform climate and disaster resilient decision making.⁸ Broadly available future climate risk information and sufficiently localised, nationally authoritative climate scenarios will better inform priorities for future critical infrastructure, risk mitigation and strategies for resilient urban planning. This work is being undertaken by the Department of Climate Change, Energy, the Environment and Water.

Critical infrastructure could be a key inclusion within the National Climate Risk Assessment to gain a national picture of the future risk the nation is facing. Further, NEMA notes translating future risk into decision-support tools such as climate scenarios should be adopted in our transport, communications and water infrastructure networks, including assessments of the interdependencies of such networks.

Climate resilient infrastructure is vital to match the changing climate. Ensuring that future road projects are constructed with the impact from our future climate in mind is vital to making sure that future generations of Australians are protected from increased risk. In regional, rural and remote Australia this is key to ensuring that communities stay connected and integrated with metropolitan areas.

NEMA recommends the Committee explore what criteria and modelling could be used to identify whether a transport corridor is considered climate resilient now and into the future, and ensure that the Committee considers a range of hazards in considering climate resilience.

3. Opportunities to enhance road resilience through the use of waterproof products in road construction

Similar to NEMA's recommendation on the first line of inquiry, NEMA supports exploring opportunities to enhance road resilience through the materials used in road construction. NEMA recommends applying this to both future construction and to existing roads through maintenance and restoration, to improve Australia's road network and seek to address legacy risk. NEMA notes materials to enhance road construction should be sourced from short and resilient supply chains where possible, and encourage using materials that support Australia's circular economy.

4. The Commonwealth's role in road resilience planning

NEMA notes the impact on supply chains on damage to road infrastructure and highlights to the Inquiry the Road and Rail Resilience Review.⁹ The Review which NEMA was consulted on, has identified and assessed the vulnerability of Australia's critical supply chain routes, the key risks that impact these routes, and existing initiatives that aim to lift resilience.

While Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) is the Australian Government lead for roads policy and programs, NEMA welcomes ongoing engagement with DITRDCA to help embed disaster risk reduction and hazard risk modelling into roads planning and policy.

NEMA is responsible for convening the NCM which will likely continue to play a role in the response and recovery phases, if there were to be significant issues to the roads network, but this forum does not engage in proactive resilience planning or roads reform.

Planning Ministers

At National Cabinet in December 2022, First Ministers tasked Planning Ministers with developing a national standard for considering disaster and climate risk, as part of land use planning and building reform processes. This is a significant step forward in protecting Australians from extreme weather events. First Ministers agreed that the days of developing on floodplains needs to end.¹⁰ Planning Ministers are expected to report back to National Cabinet in 2023.

There may be an appetite for Planning Ministers to proactively build road resilience through this process.

⁸ Department of Climate Change, Energy, the Environment and Water, [Climate adaptation in Australia](#), DCCEEW website, n.d., accessed 2 March 2023.

⁹ Bureau of Infrastructure and Transport Research Economics (BITRE) and Deloitte, [Stocktake of risks and initiatives impacting resilience of road and rail supply chains](#), BITRE and Deloitte, Australian Government, 2022.

¹⁰ Prime Minister, Media Release, 9 December 2022.



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The Committee may consider the development of improved standards for considering disaster and climate risk as part of land use planning, to reduce disaster risk and urban and road network development on floodplains.

Critical infrastructure

The Department of Home Affairs is the lead Australian Government agency for critical infrastructure. On 23 February 2023, the Department of Home Affairs released *Australia's Critical Infrastructure Resilience Strategy 2023*. The Strategy defines critical infrastructure as 'those physical facilities, systems, assets, supply chains, information technologies and communication networks which, if destroyed, degraded, compromised or rendered unavailable for an extended period, would significantly impact the social or economic wellbeing of Australia as a nation or its states or territories, or affect Australia's ability to conduct national defence and ensure national security.'

On 1 September 2021, the Department of Home Affairs established the Critical Infrastructure Centre to drive an all-hazards critical infrastructure resilience regime. Through engagement, partnerships, advice, exercises, modelling and regulation, the Centre empowers Australian owners and operators to meet best-practice standards and improve the resilience of Australia's critical infrastructure. The Centre aims to improve the continuity, security and resilience of Australia's critical infrastructure, including transport. The Centre works with critical infrastructure owners and operators through the Trusted Information Sharing Network (TISN), which is their primary engagement mechanism with industry, to continue their role in bringing together stakeholders from across the critical infrastructure community to share information and approaches to resilience and security.

Through the TISN, member organisations meet regularly within and across sector groups in a secure, non-competitive environment to enhance critical infrastructure resilience by:

- increasing awareness of threats and vulnerabilities and cross-sector dependencies;
- fostering communication between industry and all levels of government; and
- identifying gaps within each sector and implementing appropriate mitigation strategies.

Transport Network Strategic Investment Tool (TraNSIT)

With the support of industry as well as the Australian and state/territory governments, CSIRO commenced development of the Transport Network Strategic Investment Tool (TraNSIT) in 2012 and originally applied the tool to the beef industry before being extended to 98 per cent of all agriculture transport across Australia. More recently it has been extended to include fuels, forestry, mining, manufacturing and general freight.

NEMA understands that stakeholders, such as the Australian Climate Service, have been using TraNSIT to understand the impact of disasters on the roads network and the impact of road closures to critical supplies needed for community recovery after a disaster, such as fuel and food. For example, TraNSIT could consider freight movements that normally go through various road segments during a particular time period and look for alternative roads if these were non-practical, to understand the potential movement of freight and identify disruptions or potential backlogs of supply.

The inquiry could consider the role of TraNSIT in Australian Government road and supply chain management planning.

NEMA also notes activities being taken at state, territory, and local government levels through programs such as the NSW Government 'Live Traffic' portal. This portal standardises road and traffic information to a single source following a disaster, and addresses recommendations within the Royal Commission into National Natural Disaster Arrangements. Strengthened national approaches to road information could support communities throughout Australia, but particularly those in regional, rural and remote locations.

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5. Any related issues

NEMA's recommended lines of effort – as discussed in the section above on the NCM and repeated below – underline the Agency's view on how to improve the resilience of Australia's road network.

NEMA's proposed lines of effort for roads recovery

1. Prioritise works on the functionality of key transport routes.
2. State, territory, and local governments take a multi-disciplinary approach to mobilising resources to support reconstruction.
3. Commence planning work to ensure transport routes that support agriculture, industry, and remote communities are prioritised for reconstruction and betterment.
4. Engage in community messaging campaigns – across a state, regional, and local level – to outline the size and scale of a disaster event, and communicate how and when key reconstruction activities will occur.

Other areas that the Committee may benefit from considering include:

- Highlight that the construction, restoration, and ongoing maintenance of road networks should be fit-for-purpose for the communities it serves. This requires place-based and locally-led solutions to ensure that the needs of Australia's diverse communities are met by the road infrastructure serving them.
- The potential for the restoration and rebuilding of Australia's road network to more effectively support vulnerable communities. This is particularly important in regional, rural and remote Australia, where communities may face greater vulnerability.
- That betterment of roads should:
 - take into account future climate and disaster risk through risk assessment and scenario exercises
 - include materials supporting a circular economy and short, resilient supply chains where possible
 - consider incorporating nature-based solutions in adjacent areas such as bioswales – long, deep channels of plants and grasses along water channels, roads and parking lots to absorb runoff.
- State, territory, and local governments engaging early with small, medium, and large-tier contractors for available road crew and plant, in advance of disaster events, to facilitate effective action immediately following an event.
 - With widespread severe weather events, there is often not the national capacity to conduct all competing road infrastructure repairs simultaneously. This is complicated by jurisdictions having to enter tender processes and reassessments. Pre-emptive action in this space may assist in streamlining recovery processes.
- The Committee may benefit from examining the broader factors that contribute to road infrastructure issues, and how to address these in a way that considers the requirements of regional, rural and remote communities and their economies.
 - For example, the removal of farm machinery and heavy equipment during a severe weather event can be instrumental in the ability for a property owner to recover and resume operation after a disaster. However the increase in heavy equipment on unprepared roads simultaneously contributes to increased road deterioration, decreasing the resilience of a community against a future hazard event. Both issues must be considered in tandem.
- That the Committee note that the Australian Government has commissioned an Independent Review in Commonwealth disaster funding, alongside a range of other monitoring and evaluation measures, to ensure that government investment in disaster funding is fit-for-purpose and effective.

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Conclusion

Severe weather events can have longstanding and severe impacts on Australia's road networks. The impacts of these are compounded where the damage occurs in regional, rural and remote parts of the nation. NEMA is committed to seeking the betterment of road networks, and in building the resilience of communities across Australia more broadly.

Working alongside state, territory, and local governments, NEMA recognises the need to prioritise the restoration and rebuilding of key functional road networks to a higher standard than previously, taking into account growing hazard risk and a changing climate. NEMA supports the Committee's Inquiry into the implications of severe weather events on these networks, and appreciates the opportunity to make this submission. Should the Committee have any questions or concerns, NEMA would be happy to facilitate these and explore options to support regional, rural and remote communities further.

