Infrastructure Commission,
Level 7, The Todd Building,
95 Customhouse Quay,
Wellington 6011

Dear New Zealand Infrastructure Commission Te Waihanga,

EQC SUBMISSION ON THE AOTEAROA NEW ZEALAND INFRASTRUCTURE STRATEGY CONSULTATION DOCUMENT

Thank you for the opportunity to comment on 'He Tūāpapa ki te Ora Infrastructure for a Better Future: Aotearoa New Zealand Infrastructure Strategy Consultation Document' (Infrastructure Strategy).

About the Earthquake Commission Kōmihana Rūwhenua

The Earthquake Commission Kōmihana Rūwhenua (EQC) is a Crown Entity investing in natural hazards research and education and providing insurance to residential property owners from the impacts of natural hazards.

EQC offers two types of cover:

- Building cover - EQC can repair, replace, relocate, or otherwise compensate for damage to a residential building.
- Land cover - EQC can repair damage to land to enable it to continue to be suitable for residential purposes or pay out to cover the cost of relocation.

EQC covers:

- residential property damage caused by a natural landslip, volcanic eruption, hydrothermal activity, tsunami, or natural disaster fire; and
- damage to land caused by a storm or flood.

The contingent liability associated with natural hazard risk in New Zealand is high and is carried by EQC on behalf of the Crown. EQC therefore has a crucial role in reducing risk from, and building resilience to, natural hazards in Aotearoa New Zealand.

EQC Resilience Strategy for Natural Hazard Risk Reduction 2019-2029

EQC's mission is to reduce the impact on people and property when natural hazards occur. This mission is supported by our resilience goal, which is to inform, enable and influence the choices and decisions that reduce vulnerability and the exposure of New Zealand's build environment to natural hazard events. In simple terms, the result we want to see is *stronger homes, built on better land, served by resilient infrastructure, supported by affordable risk*

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capital. The four objectives of the EQC 10-year Resilience Strategy for Natural Hazard Risk Reduction[1] support this goal:

- more resilient buildings and infrastructure reduces damage and impacts;
- smarter land use avoids the worst risks;
- sustained access to insurance markets funds effective recovery; and
- reducing New Zealand's vulnerability and exposure to natural hazard events.

The resilience of buildings in a natural hazard event is directly related to the payout required from EQC.

EQC is concerned about the impact of climate change on New Zealand and the EQC scheme

Climate change will continue to exacerbate impacts from all of the natural hazards covered by EQC. These increased impacts will increase demand for EQC claims and pay-outs. Taking increased weather extremes alone, research from Motu[2] shows annual liabilities for EQC will likely increase between 1.6% and 18.1% as a result of climate change. This will necessitate at least an equivalent increase in premiums collected (and potentially more). The researchers note these figures could be underestimated.

This is likely to translate into higher damages and additional financial liability for EQC. The percent change between projected and past damages (the climate change signal), rises from 7% and 8% in 2020-40 to an increase of between 9% and 25% in 2080-2100, depending on the Green House Gas (GHG) concentration scenario. Overall, liabilities will increase more if future GHG emissions are higher.

Additionally, Motu notes that the increase in projected EQC liabilities can also inform private insurers, reinsurers, regulators, and policymakers who are assessing the future performance of both the public and private insurers covering risks in the face of climate change.

EQC feedback on the Infrastructure Strategy

EQC generally supports the Infrastructure Strategy. For the reasons set out above, EQC agrees that Aotearoa needs to take further steps to address infrastructure challenges. This is needed not only for a cleaner, greener, healthier and more sustainable future, but also for a safer and more resilient New Zealand, to ensure the hazards we will inevitably face are less likely to become disasters that threaten our prosperity and wellbeing.

A summary of our feedback is provided below. These summary points are expanded in the detailed feedback table below.

[1] https://www.eqc.govt.nz/sites/public_files/documents/grants/EQC%20Resilience%20Strategy%202019.pdf
[2] http://motu-www.motu.org.nz/wpapers/20_02.pdf

Summary

- EQC generally supports the He Tūāpapa ki te Ora Infrastructure for a Better Future: Aotearoa New Zealand Infrastructure Strategy Consultation Document' (Infrastructure Strategy), including the guiding principles.

The Infrastructure Strategy should:

1. align with other infrastructure plans and strategies. This should include the *Thirty Year New Zealand Infrastructure Plan 2015*, published by the Treasury's National Infrastructure Unit, and the Ministry of Transport *Hīkina te Kohupara – Kia mauri ora ai te iwi – Transport Emissions: Pathways to Net Zero by 2050*, currently undergoing consultation.
2. include functional recovery, including acceptable timeframes to restore agreed-upon levels of service in homes following a natural hazard event.
3. take a holistic approach to reduce emissions, including accounting for emissions over the lifecycle of transportation infrastructure assets and buildings, and the emissions implications of premature repairs, demolition, and reconstruction due to the impacts of natural hazards.
    - note that the impacts (including increased greenhouse gas emissions) of natural hazard shocks can be reduced by:
        - locating buildings and infrastructure away from areas with high natural hazard risk;
        - designing and building strong infrastructure, able to withstand hazard events; and
        - building redundancy into infrastructure networks.
4. explicitly include natural hazards, in addition to climate change, in the proposed bright-line (pass/fail) infrastructure resilience test.
5. Add a third priority under F6. i.e. F6.3: Reduce the exposure of infrastructure to natural hazards.
6. Add a fourth priority under F6. i.e. F6.4: Improve the resilience of infrastructure connections to homes.
7. Add a fifth priority under C1. i.e. C1.5: Increase resilience when recovering from disasters.
8. note that accelerating the implementation of the NPS-UD should not be at the expense of natural hazard risk management. The Infrastructure Strategy should not encourage development or intensification in areas and suburbs with high natural hazard risk, such as flood plains, active faults, volcanic fields, coastal hazard zones, and land susceptible to land instability.
9. Add a seventh priority under C2. i.e. C2.7: The coordinated delivery of housing and infrastructure should account for the natural hazard risk of the whole proposed development, and should not encourage development in high hazard risk areas.
10. Add a fourth priority under C3. i.e. C3.4: Increase alternative modes of transport.

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11. Add a fourth priority under C4. i.e. C4.4: Lead infrastructure should not be built in, or near, areas with high-natural hazard risk.
12. Add a fourth priority under S3. i.e. S3.4: Increase the resilience of existing infrastructure, including by relocating existing infrastructure away from high-hazard areas.

EQC is happy to discuss any of the above submission. Please feel free to contact me with any questions at the address below.

Ngā mihi nui,

[redacted]

Chief Resilience & Research Officer

[redacted]

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Detailed feedback table

Figure 3	*Future infrastructure cost pressures should include functional recovery, including acceptable timeframes to restore agreed-upon levels of service in homes following a natural hazard event* The Infrastructure Strategy should discuss and account for increasing expectations of buildings and communities to undertake functional recovery, supported by resilient infrastructure. Community expectations are increasing that infrastructure services will continue to be available after hazard events. Connections to homes has been identified as an area of particular vulnerability. This will likely require substantial investment.
F1.1	*Efforts to reduce embodied carbon in infrastructure assets should take a holistic approach, including considering the lifecycle of buildings, and should not be at the expense of resilience* The potential increase in emissions of low-carbon construction are currently not mentioned in the advice. While building materials such as steel and cement in concrete employ higher levels of embodied carbon, they also enable stronger structures. EQC supports the use of, and is actively funding research on the development of, greener construction materials and techniques. However, at present, equivalents to steel and cement remain rare. **Reducing the use of steel and cement in the construction process, before viable alternatives are available, will compromise the strength of structures.** This will not only result in greater risk to our communities, but also to higher greenhouse gas emissions, if buildings need to be replaced due to reduced structural integrity from a natural hazard event, than the inclusion of emission-intensive materials during original construction. For example, the carbon cost of the Canterbury earthquakes included: • embodied carbon "forgone" as the lifetime of buildings and structures were drastically reduced. For example, if a structure was built in 2000 with a 90-year life span but demolished in 2010 after the first earthquake, 80 years of embodied carbon is effectively wasted. Or, to put it differently, 90 years of embodied carbon at the construction phase was effectively invested for only 10 years of benefits. • The operational emissions involved in demolition. For example, fuel burned in the operation of heavy machinery. • The transportation emissions including for the emergency response, voluntary relocation of Christchurch residents, and for the relocation of demolition material and movement of construction materials. • The carbon cost invested to rebuild and build new structures. • The carbon embodied in maintenance throughout the lifetime of the new structures.
F1.3	*The proposed bright-line (pass/fail) infrastructure resilience test should explicitly include natural hazards, in addition to climate change.*

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F6	*Add a third priority under F6. i.e. F6.3: Reduce the exposure of infrastructure to natural hazards.* The discussion within section F6 currently almost exclusively relates to emergency response. Reducing exposure to hazards is a key mechanism to ensure the resilience of infrastructure. This includes through proactive land-use planning and decision-making. **The Infrastructure Strategy should note that the impacts (including greenhouse gas emissions) of natural hazards can be reduced by:** - **locating buildings and infrastructure away from areas with high natural hazard risk;** - **designing and building strong infrastructure, able to withstand hazard events; and** - **building redundancy into infrastructure networks.**
F6	*Add a fourth priority under F6. i.e. F6.4: Improve the resilience of infrastructure connections to homes* The definition of "critical national infrastructure" is unlikely to include infrastructure connections to homes. However, during hazard events, these can become damaged, cutting people off from access to lifelines. This problem may be increasing, as new foundation techniques encourage homes and buildings to move to reduce damage to the structure, at the potential expense of lifeline connections into the buildings. Despite the major impacts of loss of lifeline connections to homes, particularly on functional recovery, this is yet to be highlighted as an investment priority in New Zealand.
C1	*Add a fifth priority under C1. i.e. C1.5: Increase resilience when recovering from disasters* Recovery from disasters presents an opportunity to increase resilience when rebuilding, by moving (damaged) infrastructure away from high-hazard areas, and ensuring new infrastructure is designed to be resilient to hazards. As outlined above, doing so will decrease future risk to communities and decrease future greenhouse gas emissions.
C1.1	*The Infrastructure Strategy should note that accelerating the implementation of the NPS-UD should not be at the expense of natural hazard risk management. The Infrastructure Strategy should not encourage development or intensification in areas and suburbs with high natural hazard risk, such as flood plains, active faults, volcanic fields, coastal hazard zones, and land susceptible to land instability.* The Infrastructure Strategy notes that it can assist with accelerating the implementation of the National Policy Statement on Urban Development 2020 (NPS-UD). However, the NPS-UD encourages urban development and intensification around transport hubs, regardless of the natural hazard risk around these hubs. Increasing development in hazardous areas (e.g. flood plains, active faults, volcanic fields, coastal hazard zones, and land susceptible to land instability) will not only result in greater risk to our communities, but also in an increase in

	greenhouse gas emissions if buildings need to be replaced prematurely due to being impacted by a natural hazard event. Assurance needs to be provided that efforts to accelerate the implementation of the NPS-UD will not have a negative impact on resilience and potentially lead to greater carbon emissions if buildings need to be prematurely demolished and rebuilt.
C2	*Add a seventh priority under C2. i.e. C2.7: The coordinated delivery of housing and infrastructure should account for the natural hazard risk of the whole proposed development, and should not encourage development in high hazard risk areas.* The construction of new infrastructure should account for natural hazard risk, and should not encourage development in areas with high hazard risk. **The Infrastructure Strategy should also note that risk assessments across all hazards (including climate change impacts) must be undertaken when planning new development to ensure the communities (and associated infrastructure) they serve are not put at increased risk of events.** **The Infrastructure Strategy should also note that new public transport hubs, aiming to encourage densification and urbanisation, must be located in areas with lower natural hazard risks.** The coordinated delivery of housing and infrastructure has the potential to be a powerful mechanism to ensure future development is promoted in resilient locations, by ensuring new developments are located in in areas with lower natural hazard risks. In addition to reducing risk to communities, this would provide a substantial reduction in potential life cycle embodied carbon costs by avoiding widescale but periodic demolition and replacement impacts.
C3	*Add a fourth priority under C3. i.e. C3.4: Increase alternative modes of transport.* The Transport Emissions Strategy, currently out for consultation, notes that "walking, cycling and other active modes can reduce emissions, improve access and have significant health benefits" (p. 47). EQC notes that, in addition to the emissions benefits of multi-modal transport outlined in the Transport Emissions Strategy, diversifying transport modes adds redundancy into the transport system. This helps to increase the resilience of infrastructure that serves communities and will decrease the likelihood of communities becoming isolated after natural hazard events, as happened, for example, following the Kaikōura-Hurunui 2016 earthquake.
C4	*Add a fourth priority under C4. i.e. C4.4: Lead infrastructure should not be built in, or near, areas with high-natural hazard risk* See C2.

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S3	*Add a fourth priority under S3. i.e. S3.4: Increase the resilience of existing infrastructure, including by relocating existing infrastructure away from high-hazard areas.* Better use and management of existing infrastructure includes acknowledging where existing infrastructure is located in high-hazard areas, and working towards increasing the resilience of this infrastructure. Investment in existing infrastructure should aim to increase the resilience of the infrastructure. In particular, transport hubs such as railway stations and ferry terminals, should preferentially be located away from locations with high natural hazard risks, such as earthquake fault, landslide, tsunami and volcanic hazard risks. Continuing to upgrade or replace infrastructure in areas of high natural hazard risk will lead to increased disruption and greenhouse gas emissions (for example, if people switch from using the train to using their cars during the disruption). Ongoing discussion around the replacement of the Interislander ferry terminal provides a timely example where the option to locate away from a high-hazard area may not be chosen. The Transport Emissions Strategy notes that *'Current investment priorities for rail as outlined in the draft New Zealand rail plan, include the replacement of freight locomotives and the inter-islander ferry assets which are at or beyond their economic lives. Renewing these assets will lead to further reductions in the emissions from the rail network'* (p. 87). However, KiwiRail currently intends to rebuild the Interislander ferry terminal in the same location. This would miss the opportunity to re-site the terminal away from the Wellington Fault. Moving the ferry terminal to a second proposed location (which is supported by CentrePort, Wellington City Council, and Wellington Regional Council, along with other harbour users) would move the terminal away from the fault. As outlined above, relocating the terminal to the proposed location, would not only reduce emissions in the long-term, but have resilience benefits also.

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