Earthquake-prone building system and seismic risk management review

June 2025

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Key Terms

Building vulnerability	Refers to the susceptibility of a building structure or part to result in structural failure in the event of an earthquake. For example, profile categories in the current system identify buildings which have demonstrated high vulnerability in past earthquakes.
Consequence Categories	These are divided into low, regular and high levels to reflect the degree of exposure to people in and around a building, which helps to assess the potential for injury or death for people in the event of an earthquake. Further work is required to provide definitions for *Low*, *Regular* and *High* human exposure categories. It is possible that proxies for low exposure, such as being in a small regional centre, could be used.
EPB	Earthquake-Prone Building.
%NBS	Extent to which a building meets the requirements of the New Zealand Building Code as at 1 July 2017.
Priority Building	A priority building requires quicker seismic strengthening due to its high risk or being critical for emergency response. Priority buildings include hospitals, emergency service buildings, educational facilities, buildings along strategic transport corridors, and URM buildings with parts that could fall onto public areas.
Profile Category Buildings	Category A - Unreinforced masonry. Category B - Pre-1976 construction, three or more storeys or over 12m high. Category C - Pre-1935 non-URM construction that is one or two storeys high.
Risk Notification	Requirement to post notice on building that it is earthquake prone.
Retrofit to EPB Threshold	Retrofitting to 34%NBS or its equivalent.
Seismic zones	Low, Medium, High (refer to Figure 2 and Table 1).
Simple Strengthening	An easier to implement “acceptable solution” or standardised retrofit to EPB threshold for most one and two storey URM buildings.
TA	Territorial Authority.
Targeted Retrofit	A retrofit which targets specific vulnerabilities with the highest life safety risk in the building. Façade securing for URM buildings, which addresses the life safety risk of façades, exterior walls, and parapets, is a form of targeted retrofit.
URM	Unreinforced masonry.

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Executive Summary

New Zealand's Earthquake-Prone Building (EPB) system aims to protect life safety by ensuring our buildings are seismically resilient

1. New Zealand is one of the most seismically active countries in the world, and as such, our approach to managing seismic risk in buildings has evolved to incorporate new knowledge and overseas experience. Despite this, the 2011 Canterbury earthquakes caused catastrophic loss of life and property damage. This highlighted the importance of seismically resilient buildings, and in particular the dangers posed by unreinforced masonry (URM) and older concrete buildings.
2. The Royal Commission of Inquiry that was set up to investigate the reasons for the high loss of life identified a series of problems with the existing system. Following its report, the Building Amendment Act 2016 brought the current EPB system into effect. It aims to protect life safety, in light of the varying seismic risk levels across New Zealand. Its key features include that:
    - EPBs must be identified by territorial authorities (TAs) and recorded on a national register
    - EPB remediation is mandatory, with shorter timeframes in higher risk areas
    - all buildings are assessed relative to the requirements for new buildings in place in 2017 when the EPB system came into effect.

Some parts of the current EPB system are working well, but others are not

3. Some parts of the EPB system are working well. Territorial authorities, engineers and MBIE are clear on their responsibilities, national consistency has improved, and some 1,500 EPBs have been remediated. But despite this, further progress will likely become more difficult - until the recent extension, many buildings were not on track to meet their remediation deadlines. Further extensions are unlikely to make much difference because of the significant barriers to remediation that many EPB owners face.
4. These barriers vary, but often relate to finance. Since August 2024, MBIE has received 77 submissions providing feedback on people's experiences with the current EPB system. Nearly all highlighted the significant financial burdens imposed on EPB owners. These include that:
    - remediation can be disruptive, beyond the means and/or capability of the building owner(s), or simply uneconomic (especially for provincial centres, small businesses and apartment owners)
    - insurer preferences for more resilient buildings drive up costs and make getting remediation finance more difficult
    - heritage rules pose additional barriers to remediation.
5. Our review has also identified other problems with the current EPB system. These include that:
    - some buildings are being vacated or strengthened in disproportion to their risk
        - the use of seismic assessments and the %NBS measure to determine if a building is earthquake-prone is sensitive to assumptions and judgements made by engineers
        - this is also driven by perceived health and safety obligations, and by misunderstandings of the %NBS measure

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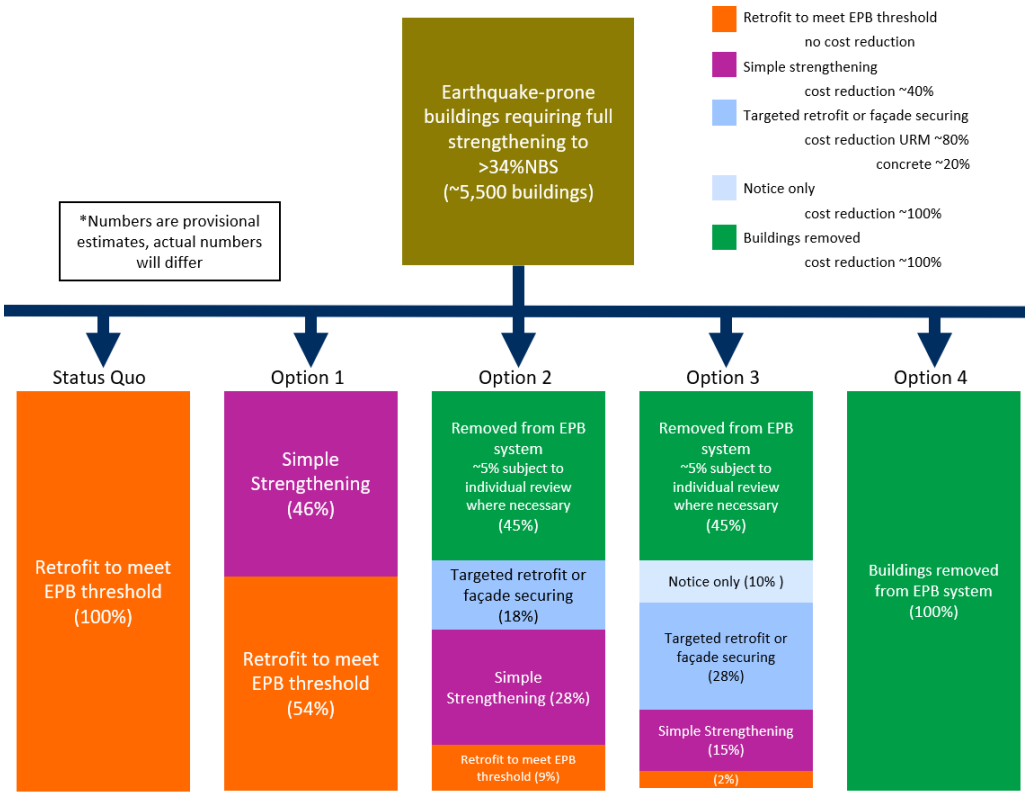
- many buildings being captured by the EPB system are not the types originally intended, because the 'at any time' pathway is being used more frequently than was envisaged, and some TAs are choosing to address consent non-compliance through the EPB system
- enforcing remediation deadlines is costly, time-consuming, and impractical for TAs.

We recommend focusing regulatory obligations on high-risk concrete and unreinforced masonry buildings

6. We propose retaining life safety as the primary objective of the EPB system, but with more emphasis on proportionality and targeting the consequences of building failure. With this objective in mind, we have considered options ranging from incremental improvements to removing the current regime entirely. These are:
   - Option 1: improve the current system
   - Option 2: reduce the current system's scope but retain its essential features
   - Option 3: focus regulatory obligations on high-risk concrete and unreinforced masonry buildings[1]
   - Option 4: remove the EPB regime entirely.
7. The impacts of these options on existing EPBs are set out in Figure 1 below:

Figure 1: Impact of EPB system change options on existing EPBs



[1] Option 3 lends itself to scaling remediation obligations to account for risk appetite. To illustrate this, this report also describes two variants of Option 3: 3a and 3b. These use the same approach to targeting risk, but achieve further savings by focusing remediation obligations on (for 3a) buildings which present an elevated risk to the public, and (for 3b) a smaller set of buildings which are critical for disaster response. We have not modelled the impacts of these sub options in this report as they are presented for illustrative purposes.

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8. Option 3 – mandatory remediation to the highest risk buildings only – performs best against our assessment criteria, as set out below.

Criteria	Option 3 performance
Effective - at reducing life safety risk in existing buildings.	Better life safety outcomes through more focused (and hence feasible) mitigation of high risk (worst of the worst) buildings.
Proportionate - intervention is proportionate to the risk posed.	Obligations are tailored to actual risk with lesser obligations for lower risk buildings.
Efficient – system costs directly relate to reducing seismic risk.	Engineering and construction resources will be directed toward interventions with the greatest reduction in life safety risk. Eliminates the need for seismic engineering assessments in their current form to identify a building as being earthquake prone.
Certain – building owners' obligations are clear.	Once building classifications are finalised, building owners will have clear obligations (or lack thereof).
Administratively simple - the system is simple to administer, and the costs of doing so are reasonable.	While initial setup is more complex than all other options, long-term administration is simpler due to fewer buildings having mandatory remediation obligations.

9. Preliminary analysis from Beca across six locations[2] suggests that:

- Option 1 would provide around $0.5 billion in relief from mandated strengthening costs for EPB owners. The benefit-cost ratio for this option is around 2-4% less favourable than the status quo, depending on the level of ground shaking. This option continues to impose remediation obligations and costs that may not always be proportionate to the actual risk, and fails to adequately address the misclassification of buildings not originally intended to be captured under the EPB system
- Option 2 would save around $2.7 billion and provides a benefit-cost ratio that is 7-11% less favourable than the status quo. This option's marginal benefits are only slightly higher than for Option 3, but seismic remediation costs are significantly higher
- Option 3 provides the highest benefit cost ratios across all options for the levels of ground shaking analysed. This option could save $5.3 billion and provides a benefit-cost ratio that is 22-43% more favourable than the status quo
- Option 4 would save around $7.9 billion (100% reduction), as all EPB owners are relieved of mandatory remediation obligations. But there would also be no benefits from seismic remediation, including for the worst of the worst buildings.

10. Option 3 appears to best balance reducing compliance costs for EPB owners and the wider community while maintaining the benefits of seismic strengthening. Accordingly, we recommend using Option 3 (and its potential variants) as a starting point for further policy work, with final decisions on the preferred approach to be made following further discussions and feedback.

11. Further work we need to do includes:

[2] Beca's study compares the relative change in total benefit to cost from the benchmark of strengthening to 34%NBS versus one of the policy options. This data aggregates results from six locations (Auckland, Wellington, Christchurch, Dunedin, Feilding and Whanganui), which involves high levels of uncertainty and does not represent an actual earthquake scenario. Also, Beca's analysis assumes full compliance with current remediation requirements under the EPB system. This level of compliance is unlikely under the current system. For these reasons, BECA's results should be treated as indicative only.

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- preparing for legislative and regulatory changes
- operational preparation and transitional planning
- addressing issues for EPB owners that arise from rules outside the Building Act
- developing more workable compliance tools.

12. Two other areas also require significant additional work:

    - support for apartment owners. Many inner-city apartments that are current EPBs will retain that designation under options 3 and 3a, due to the considerable life safety risk they pose. We do recognise that some owners of units in apartment EPBs face challenging financial and process-related barriers to getting their buildings remediated. We propose further work to identify potential ways of supporting these owners
    - managing changes to the New Building Standard (%NBS) measure. The %NBS measure has several flaws and is not used under our recommended option. We believe having a seismic life safety measure is still useful, and propose to work with engineers and building owners to assess if a more suitable measure can be developed.

Our analysis has been informed by public and sectoral engagement, and independent research

13. To help us access expertise, practical experience and hear a range of perspectives, we convened an external Steering Group with an independent Chair to oversee the Review. Its members included TA staff, engineers, risk management experts, and representatives of commercial and residential building owners. The Steering Group has helped shape the review through regular input and workshops.

14. We established sector-specific reference groups to allow more opportunities for external perspectives to be heard. They included engineers, local government, government EPB building owners, residential building owners, the insurance and banking/finance sector, commercial building owners (including Chambers of Commerce and the Property Council), community building owners, tenants and property developers. We also met with WorkSafe and core government agencies.

15. Additionally, we received 77 written submissions. Nearly all highlighted the financial burden for EPB owners. Other concerns included inconsistencies between engineering assessments, distrust of the system and consultants, and the impact of EPB status on property values.

16. The vast majority of submitters suggested a more risk-based approach that better considers seismic risk by region, building type, and public exposure. They also called for financial support in some form, especially for heritage and residential building owners. The next most common themes were criticism of how %NBS is interpreted and applied, and a desire for engineering assessments to be more prescriptive and transparent.

17. Research we commissioned has found that:

    - There is strong public support for regulatory measures to mitigate life safety risk, but not necessarily beyond that (eg to ensure resilience and avoid disruption). Most survey respondents think that that building owners should bear remediation costs, while half support some tax funding for private apartments and medical facilities.
    - Market expectations play a key role in encouraging upgrades but less so in residential and not-for-profit contexts.

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- Retrofitting URM buildings yields the greatest life safety benefits, especially in high seismic zones like Wellington.
- New Zealand is unusual in relying upon mandatory retrofitting or demolition as the primary means of resolving the seismic risk posed by existing buildings. Options 3 and 4 would put New Zealand into closer alignment with international practice.
- Effective seismic risk mitigation overseas contains a mix of financial incentives, phased approaches prioritising high-risk buildings, public transparency and robust enforcement. Success is often driven by strong local leadership and sustained public engagement.

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1. Purpose, scope and methodology

1.1. Cabinet has commissioned a review of the Earthquake-Prone Building (EPB) system

18. In April 2024, Cabinet directed MBIE to review the EPB system to ensure seismic risk in existing buildings is managed effectively. This decision was made in response to growing concern that the current suite of seismic remediation rules may not be working as intended. The review was to consider:

    - how to measure and mitigate seismic risk
    - if the current EPB system has been implemented and operationalised as intended
    - how barriers to remediation, including finance and funding factors, impact the management of seismic risk in existing buildings, and possible support or incentives to overcome barriers
    - which buildings should be subject to regulatory requirements
    - whether the timeframes for identification and remediation of earthquake-prone buildings are equitable and proportionate to the level of risk posed.

19. In undertaking this work, MBIE has sought to factor in:

    - society's expectations and willingness to pay for mitigating the risk of injury and death in the event of an earthquake, and for improving the resilience of buildings over time
    - how outcomes from seismic risk requirements align with broader Government objectives, such as going for housing growth, rebuilding the economy
    - whether regulatory responses for managing seismic risk in existing buildings are workable, equitable, and balance mitigation of life safety risks against the costs of regulation and impact on private property owners.

1.2. To inform our analysis, we engaged with a wide range of stakeholders…

20. To help us access expertise and practical experience, and to ensure we heard a range of perspectives, we convened an external Steering Group. Its members included TA staff, engineers, risk management experts, and representatives of commercial and residential building owners. The Steering Group has helped ensure the Review is thorough and takes into account a range of stakeholder views. Its members have met regularly, and their input has shaped the policy direction both through their own expertise, and through their networks with wider audiences.

21. We also established several informal and sector-specific focus groups. They include engineers, local government, government EPB building owners, residential building owners, insurance sector, bank/finance sector, commercial building owners (including Chambers of Commerce and the Property Council), community building owners, building users (tenants) and property developers. In total, we met 49 times with 19 different stakeholder groups. We also met with WorkSafe New Zealand and core government agencies.

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1.3. sought public submissions …

22. Since August 2024, we have received 77 submissions about the current EPB system.[3] Submitters included building owners and users, advocacy groups, investors and engineers. Nearly all submissions highlighted the significant financial burdens imposed on earthquake-prone building owners. Other concerns included inconsistencies between engineering assessments, distrust of the system and consultants, the impact of EPB designations on property values, and a lack of information or support from central and local government.

23. Submitters from Wellington were especially concerned with the impacts on residential and heritage building owners, and noted the lack of financial support and difficulties getting insurance. Submitters from Auckland suggested that the current system overstates risk in low seismic areas.

24. Almost all submitters favoured a more risk-based approach that better considers seismic risk by region, building type and public exposure. Most also called for financial support in some form, especially for heritage and residential building owners. The next most common themes were criticism of how %NBS is interpreted and applied, and a desire for engineering assessments to be more prescriptive and transparent.

25. Other suggestions included exempting buildings or adopting risk disclosure notices for heritage and residential buildings in low seismic areas. Some submitters noted that despite regulatory change, there would be ongoing difficulties with lending and insurance.

1.4. … and commissioned independent research

26. Our analysis was informed by several independent research projects.

SAPERE - IMPLEMENTATION AND OPERATIONALISATION OF THE EPB SYSTEM

27. This review identified where implementation and operation of the system by MBIE, TAs and engineers is and is not working well. It found that:

- the parties are effectively discharging their responsibilities under the Act
- each party is undertaking their role efficiently given their role and resourcing
- TAs are implementing the EPB system more consistently than before 2017.

28. But there are significant issues and challenges:

- risks to future remediation compliance as many building owners wait to the deadline before doing anything
- potential a system-wide opportunities to improve efficiency
- inconsistency across engineering assessments, with differing interpretations of the requirements
- a system-wide tendency towards conservativism is creating unintended outcomes.

29. Key opportunities for improvements include establishing monitoring and feedback channels to assist in practical implementation, improvements in communication from MBIE, assistance in disseminating and testing best practice in engineering assessments, support for effective council enforcement mechanisms and greater visibility of progress.

[3] 51% of the submissions were about residential buildings, followed by commercial (18%), mixed-use (12%), and community or charity (7%). Half of the submissions came from individuals in Wellington (50%), followed by Auckland (25%), Canterbury (15%), with the remainder ranging from across New Zealand as a whole.

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RESILIENT ORGANISATIONS - PUBLIC EXPECTATIONS AND BEHAVIOUR

30. This research project evaluated the public's willingness to pay taxes to fund mitigating seismic risk and building owners' behavioural response to seismic risk under the current EPB system. It found that the public continues to value life safety as the most important seismic resilience attribute, more than building durability, damage reduction and minimisation of disruption.

31. Most people support regulating to improve life safety, and believe that EPB owners should bear all or most of the cost of remediation. But there is support for some partial government assistance for non-commercial building uses - around half of those surveyed supported some tax funding for private apartments, and private medical facilities.

32. The study also found that market expectations are, in and of themselves, powerful drivers for remediation (eg because higher %NBS buildings can command higher rentals). But these forces are unlikely to drive remediation in residential apartments, buildings owned by not-for-profits and small businesses, or EPBs in small regional centres.

33. Lenders and insurers also play a key role in driving remediation through the performance requirements they set, which are often over and above those required by legislation. These requirements promote enhanced seismic resilience for building owners who can access funding, but create additional barriers to remediation for those who cannot.

BECA - ECONOMIC ANALYSIS OF NEW ZEALAND'S CURRENT EPB SYSTEM

34. This is a scenario-based economic analysis of seismic upgrades to 34% and 67%NBS at different Annual Probability of Exceedances of earthquakes using the latest National Seismic Hazard Model. It found that retrofitting URM buildings – even to the minimum standard of 34%NBS – provides the greatest life safety benefit.

35. These benefits vary significantly by location, with higher benefit cost ratios in high seismic zones areas like Wellington. But in the event of a rarer, high impact earthquake, the life safety risk in areas like Auckland and Dunedin would significantly increase. BECA also found that strengthening buildings can reduce carbon emissions by 85% compared to full replacement.

QUAKECORE - SEISMIC RISK MITIGATION PROGRAMMES IN OVERSEAS JURISDICTIONS

36. This report looked at seismic risk mitigation management of existing buildings in the United States, Taiwan, Japan, Italy, Türkiye and Mexico to identify best practices and common challenges. It found that New Zealand is unusual in relying upon mandatory remediation as the sole means of resolving the risk posed by existing buildings in earthquakes. Nearly all of the overseas programmes also have some form of financial incentives.[4]

37. In the jurisdictions studied only certain local jurisdictions in California have mandatory remediation requirements for private buildings (although local governments in Japan can do so). In Taiwan and Japan, mandatory requirements are only applied to public buildings and critical facilities such as schools and hospitals.

38. The report found that high remediation rates overseas could be attributed to a combination of financial incentives and phased retrofitting which targets the most vulnerable buildings first

[4] Nearly all of the programmes reviewed have some form of financial incentives. Taiwan and Japan included mandatory programmes for public buildings (eg schools) and incentive programmes for private buildings. US includes multiple mandatory programmes (typically with some form of financial incentives - some started without financial incentives and found low compliance rates then later instituted support for building owners of some form) – all instituted at a local government level. Other than New Zealand, only the US has implemented mandatory programmes for private buildings.

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and, within that, prioritises buildings with the highest occupancy or public use. It also found that success overseas could be attributed to factors such as:

- publicly funded financial incentives to make seismic retrofitting more affordable
- incremental and simplified/targeted retrofitting standards for certain building types
- a seismic risk disclosure system which increases transparency about seismic risks
- public awareness and stakeholder engagement
- strong penalties for non-compliance, expansive powers for local authorities to enforce compliance or order evacuation, and public reporting of critical compliance milestones
- strong local leadership, with larger cities taking the lead in developing comprehensive seismic risk mitigation programmes.

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2. New Zealand's EPB system aims to protect life safety by ensuring our buildings are seismically resilient

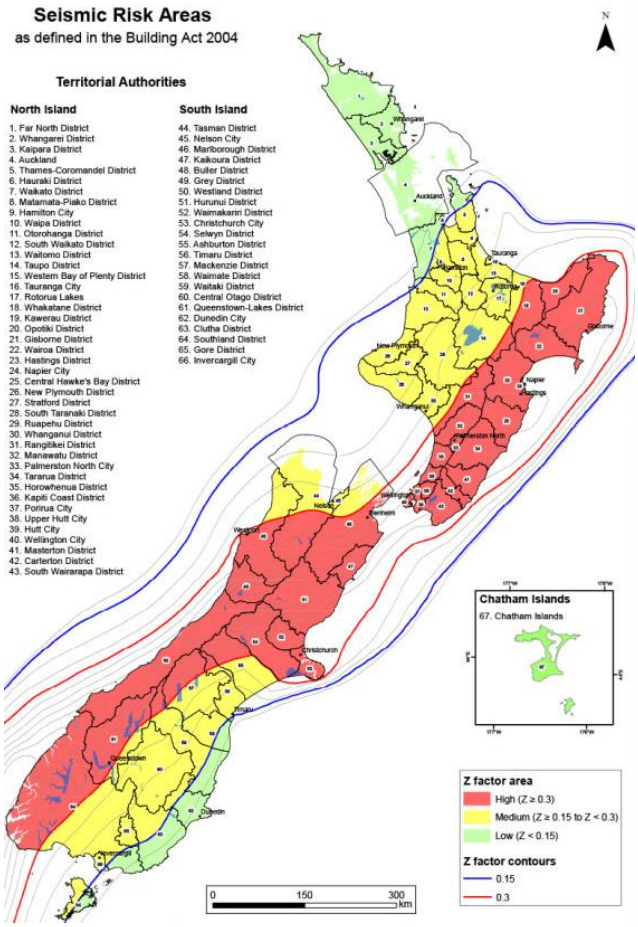
2.1. New Zealand is one of the most seismically active countries in the world

39. New Zealand sits on the boundary between the Australian Plate and the Pacific Plate, which form segments of the Earth's crust and are constantly shifting. At their boundaries they may diverge, slide past each other or converge. Globally, most earthquakes and volcanic events occurs along the boundary of tectonic plates. The Pacific Plate is the largest and fastest-moving major tectonic plate. It forms part of the Pacific Rim (also known as the "ring of fire"), a region known for its intense seismic and volcanic activity.

40. The Pacific and Australian Plates collide in the North Island, where the Pacific Plate "subducts" beneath the Australian Plate along the Hikurangi Trough (east coast). Subduction is also occurring off the coast of Fiordland, where the Australian Plate subducts beneath the Pacific Plate. In the central South Island, the plates "glance" against each other, causing lateral movement and vertical uplift.

41. Over millions of years, this movement has created the Southern Alps. Around 75% of the plate movement in the central South Island occurs through earthquakes along the Alpine Fault. The remainder is spread across a web of geological faults to the east of the Alpine Fault. Areas with higher strain rates, such as those near major faults like the Alpine Fault, are more prone to seismic activity (see Figure 2 below).

Figure 2: New Zealand's seismic zones



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42. The ongoing accumulation of strain in the Earth's crust must eventually be released in the form of earthquakes. This makes New Zealand one of the most seismically active countries in the world. Each year over 15,000 earthquakes are recorded, with around 100 to 150 strong enough to be felt.

43. Earthquake magnitudes are described by various scales, of which the most well-known is the Richter scale. The Richter magnitude (in modified form) is the magnitude often initially reported by GNS Science because it can be quickly determined using nearby seismographs. Historical records suggest that we typically experience several magnitude 6 earthquakes annually, a magnitude 7 every decade, and a magnitude 8 roughly once a century.

44. The existence of the Port Hills fault was unknown before the 22 February 2011 Canterbury earthquake. There is evidence to indicate that no significant earthquake had occurred on this fault (or the fault that ruptured on 13 June 2011) within the last 8,000 years. Likewise, the Greendale fault was not known of before the 4 September 2010 Darfield earthquake. This highlights that previously unknown fault lines may present significant life safety risks across all New Zealand's seismic zones.

2.2. From 1930-2010, New Zealand's approach to managing seismic risk in buildings evolved to incorporate new knowledge and overseas experience

EARLY HISTORY

45. Before modern measurement tools, earthquake magnitudes were estimated from physical evidence and eye-witness accounts, including Māori oral traditions. Between 1840 and 1904 there were at least seven earthquakes of magnitude 7 or greater. The strongest earthquake was the 1855 Wairarapa earthquake, with an estimated magnitude of 8.2.

1929 – 1935: FIRST EARTHQUAKE LEGISLATION

46. Early approaches to seismic risk in New Zealand building design evolved in response to major earthquakes and growing engineering knowledge.

47. In the three-year period from 1929 to 1931, there were five magnitude 7 earthquakes. They included the Buller earthquake in 1929, which resulted in 17 deaths. The 1931 Napier earthquake of magnitude 7.4 caused the largest loss of life and most extensive damage of any quake in New Zealand's history. It resulted in the death of 256 people and 593 serious injuries - most of these the result of damage to URM buildings.

48. The Napier earthquake prompted New Zealand's first seismic building rules. While not outright banned in legislation, the poor performance of URM buildings in the Napier Earthquake led to a near-complete stoppage in the use of URM from early 1930s onward. The 1935 Building Code included a change focused on ensuring that buildings were tied together to resist horizontal ground motion. The same year, requirements were introduced that private buildings must be designed to withstand horizontal forces equal to 8% of their gravity loads (and 10% for public buildings).

1965 – INTRODUCTION OF SEISMIC DESIGN PRINCIPLES

49. By the 1960s, understanding of seismic performance had significantly advanced. There was widespread recognition that a building's ability to absorb energy and deform without collapsing (ductility) was as crucial, if not more so, than building strength. Initial building codes had assumed that standard designs would provide sufficient ductility, but overseas earthquakes revealed this was not the case.

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50. Two influential papers by New Zealand engineer John Hollings in 1969 introduced the concept of “capacity design” to protect vulnerable parts of a building structure during earthquake shaking – a concept now used around the world. While not introduced in building design standards until 1976, many engineers started to introduce these concepts in building designs from the late 1960s, thus dramatically improving life safety in these buildings.

51. In 1965, New Zealand’s seismic zoning system was formalised, with the country divided into three zones based on seismic hazard: Zone A (highest, including Wellington), Zone B (including Christchurch) and Zone C (including Auckland and Dunedin). All URM buildings were banned in Zone A and were limited to one to two storeys in Zones B and C, respectively.

1968 – INTRODUCTION OF MUNICIPAL POWERS TO MANAGE EARTHQUAKE-PRONE BUILDINGS

52. The Municipal Corporations Amendment Act 1968 empowered TAs to intervene if they deemed a building likely to be dangerous in an earthquake. TAs could require building owners to demolish or remediate the building to the council’s satisfaction within a specific timeframe.

1976 – NEW REQUIREMENTS FOR BUILDING DESIGN

53. Research in the 1960s and early 70s as well as observations of building performance in earthquakes overseas led to the 1976 Seismic Loadings Standard being substantially revised. Subsequent changes to Material Standards for steel, reinforced concrete, timber and reinforced masonry, all with ductility-focused detailing, dramatically improved seismic resilience in New Zealand buildings. These changes effectively ruled out the use of URM for resisting lateral forces, although it had not been used in practice for many years.

1991 – FIRST SET OF NATIONAL REQUIREMENTS FOR EPBs

54. The Building Act 1991 introduced the concept of EPBs for the first time, but restricted it to URM buildings. The threshold level for what constituted an EPB was also set low, with the moderate earthquake definition tied back to one-half of the 1965 structural design code.

1992 – INTRODUCTION OF A PERFORMANCE-BASED BUILDING CODE

55. New Zealand's first unified national building regulation was introduced with the Building Act 1991 and Building Code 1992. Unlike prescriptive earlier codes, this performance-based code focused on how buildings should perform during earthquakes, allowing for innovative construction methods. The primary aim was life safety in major earthquakes, even if buildings were badly damaged.

2004 – REGULATORY FRAMEWORK EXTENDED TO EXISTING BUILDINGS, %NBS INTRODUCED

56. The Building Act 2004 removed the URM constraint to encompass any seismically vulnerable building, and raised the threshold to tie a moderate earthquake to one third of current code requirements. It also required that TAs develop and consult on a policy for managing EPBs.

57. This version of the Act also introduced the concept of the New Building Standard (%NBS) via the 2006 Seismic Assessment Guidelines. Buildings below 34%NBS - the minimum acceptable level for seismic strengthening - were considered high risk. These changes were made in response to the catastrophic failure of early multi-storey concrete buildings overseas during the preceding twenty years (see Figure 3 below).

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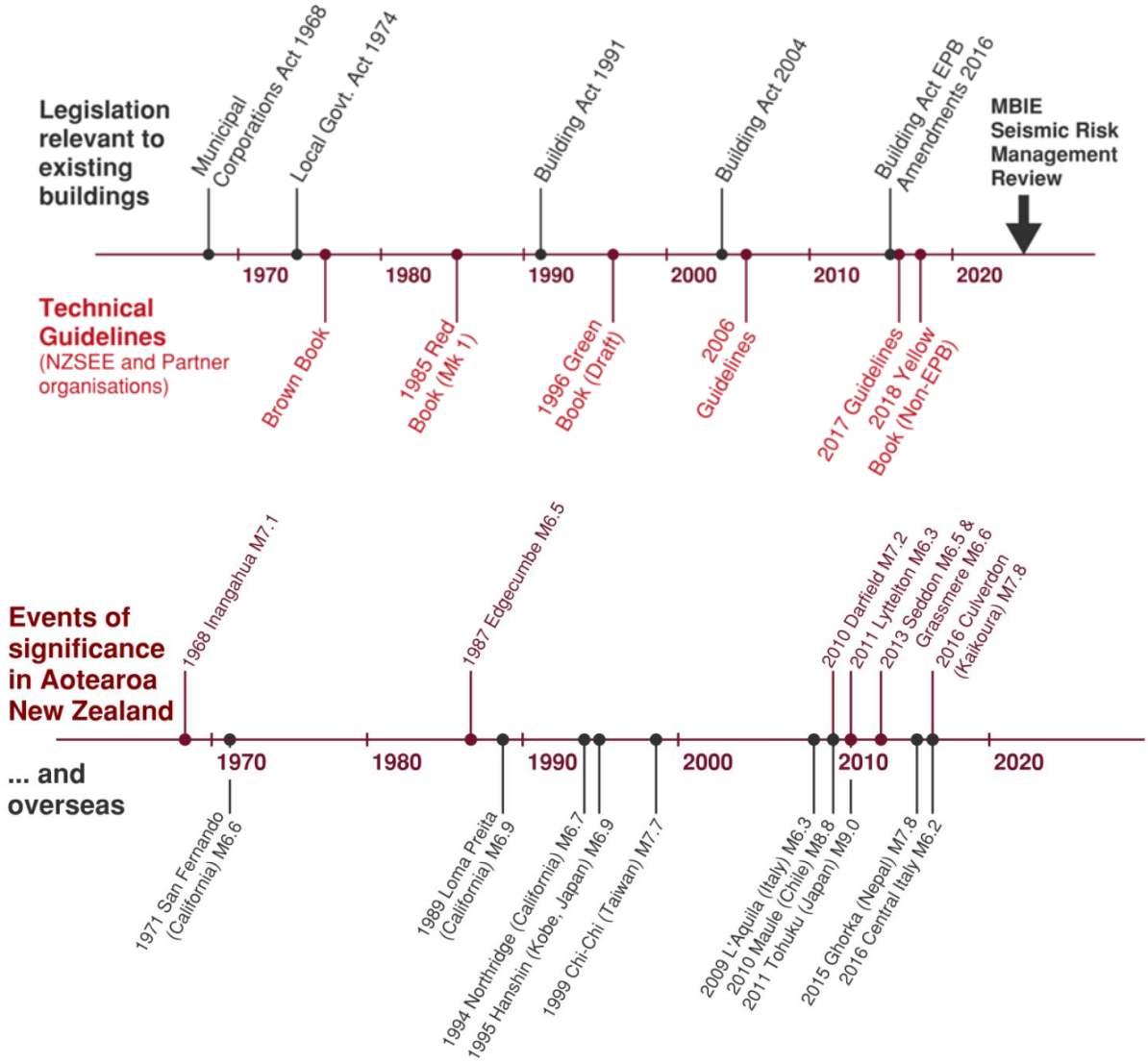
Figure 3: Seismic events and seismic policy changes in New Zealand



2.3. The Canterbury earthquakes highlighted the importance of seismically resilient buildings

THE 22 FEBRUARY 2011 CANTERBURY EARTHQUAKE CAUSED CATASTROPHIC LOSS OF LIFE AND PROPERTY DAMAGE

58. Since 2000 there has been an increase in the number of earthquakes of magnitude 7 or more, although until September 2010 these had all occurred away from population centres. On 4 September 2010 a magnitude 7.1 earthquake struck on the previously unknown Greendale Fault near Darfield. No lives were lost due to building failure, but there was widespread damage in Christchurch. Over the following year there were more than 11,200 aftershocks.

59. On 22 February 2011, there was a magnitude 6.2 earthquake on the Port Hills Fault. It killed 185 people, displaced over 300,000, and damaged over 100,000 residential properties. 115 deaths occurred when the six-storey 1980s Canterbury Television (CTV) building collapsed, and 18 people died when the five-storey 1966 Pyne Gould Corporation building collapsed. Forty-two people were killed by other building failures. Of these:

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- 35 were because of the façade or walls of URM buildings collapsing onto:
  - pedestrians or persons in vehicles
  - people in a neighbouring building
  - people who had run out of a building to escape
- four people were killed inside a URM building
- one infant killed by a chimney breast collapse
- one person who had run out of a building was crushed by a free-standing wall
- one person killed by a concrete spandrel that fell from a car park building onto their vehicle.

… AND HIGHLIGHTED THE DANGERS POSED BY UNREINFORCED MASONRY BUILDINGS

60. Nearly 70% of the deaths caused by these building failures impacted pedestrians and vehicle occupants outside the buildings. A further 110 people were injured by falling masonry. This highlights that URM buildings are a significant community problem and the need to address the potential dangers of collapsing façades, walls and parapets (see Figure 4 below).

Figure 4: Collapse of the façade of a two-storey building in Christchurch, February 2011

Photograph by Win Clark, image supplied by MBIE.

THE ROYAL COMMISSION IDENTIFIED A SERIES OF ISSUES WITH THE EXISTING RULES

61. To understand why such significant loss of life occurred and why certain buildings failed while others did not, the Government initiated the Canterbury Earthquake Royal Commission of Inquiry. It began in April 2011 and was completed in November 2012. Key issues it identified included:

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- poor understanding of the risks posed by earthquake-prone buildings
- too much variability in approaches to implementing policy requirements by TAs
- decision-making being difficult for TAs, building owners and building users as information on building strength was not widely available or easy to find and use
- poor quality information on New Zealand's building stock, the number and location of EPBs and the strength of individual buildings
- a lack of central guidance and limited central monitoring and oversight of the sector.

62. To address these issues the Royal Commission recommended a series of changes to the legislation, policies, and practices underpinning how New Zealand manages earthquake-prone buildings, to better manage risk to life safety.

2.4. The 2016 Act was designed to better protect life safety in light of varying risk levels across New Zealand

63. The Building (Earthquake-prone Buildings) Amendment Act 2016 (the 2016 Act) sought to address issues identified with the previous system, incorporate building performance information learnt through the Canterbury earthquakes, and reflect the Royal Commission's recommendations. Its objectives are to protect life safety while targeting – and imposing seismic remediation costs onto – districts and buildings that pose the greatest risk. Its requirements reflect the varying risk levels across New Zealand, with shorter timeframes for remediation in higher seismic zones (see Figure 2 above and Table 1 below).

Table 1: Timeframes for EPB remediation

Seismic zone[5]	Identification	Assessment	Remediation
Low	15 years	12 months from issue of earthquake prone building notices	35 years
Medium	10 years, 5 years for priority buildings[6]		25 years, 12.5 years for priority buildings
High	5 years, 2.5 years for priority buildings		15 years, 7.5 years for priority buildings
Category 1 Heritage Buildings	Dependent on corresponding seismic zone above		May apply for an extension of 10 years

IT REQUIRES EPBs TO BE IDENTIFIED ON A NATIONAL REGISTER

64. If a building is found to be earthquake-prone, the relevant TA issues it with an EPB notice, detailing the building's risk, required remediation actions, and the relevant deadlines. TAs are required to compile a list of EPBs within their district and share this information publicly. MBIE keeps a centralised record of these buildings in the National EPB Register. The register lists building seismic ratings, remediation deadlines, and any extensions or exemptions.

[5] In 'low' zones, the seismic hazard factor is still relatively high compared to other countries. In Australia, for example, a seismic zone deemed low risk here would be classified as a moderate-to-high seismic zone.
[6] A priority building requires quicker seismic strengthening due to its high risk, or being critical for emergency response. Priority buildings include hospitals, emergency service centres, educational facilities, strategic transport corridors, and URM buildings with parts that could fall onto public areas.

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SOME BUILDINGS ARE EXCLUDED BY DEFAULT

65. Residential buildings with up to two floors and three family units are excluded from the Building Act's EPB provisions by default. Other exclusions can be made for low risk buildings (eg on farms), based on factors such as location, construction type, and occupancy. Bridges are also excluded.

TERRITORIAL AUTHORITIES HAVE COERCIVE POWERS TO MANAGE EPB SAFETY RISKS

66. The 2016 Act authorises TAs to:

- issue warning notices: TAs can require the display of notices warning people not to enter or approach hazardous buildings
- restrict access: TAs can block access to dangerous buildings by installing hoardings or fences, and restrict access for periods up to 30 days
- remediate or demolish at the owner's expense: If an owner fails to comply with remediation requirements by the set deadline, the TA may carry out the necessary work at the owner's expense, upon receiving permission from the District Court. This may include demolition of unsafe structures.

NEW INFORMATION ON BUILDING PERFORMANCE IS NOT USED IN THE EPB SYSTEM

67. On 14 November 2016, a magnitude 7.8 earthquake struck 15 km north-east of Culverden, North Canterbury. It was the most powerful earthquake in the region in over 150 years. It resulted in two fatalities and caused widespread damage, including to essential connections and infrastructure in the Kaikōura region. Numerous slips severed road and rail links, isolating Kaikōura from both the north and south.

68. The Kaikōura earthquake caused damage to mid- and high-rise buildings in Wellington, particularly those with precast concrete floors. Floor units collapsed in Statistics House, with no fatalities because the earthquake occurred at night. MBIE commissioned an expert panel to investigate the factors that led to this partial floor collapse.

69. Following the panel's Statistics House investigation recommendations, MBIE updated the Seismic Assessment Guidelines to include content on how to assess buildings with precast concrete floors. This resulted in the publication of the Yellow Chapter, which is now widely used by engineers to assess concrete buildings not classified as EPBs. The Yellow Chapter is not used for EPB assessments, as it was published after the 2016 Act.

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3. Some parts of the EPB system are working well, but others are not

3.1. Some things are working well, but further progress will become progressively more difficult

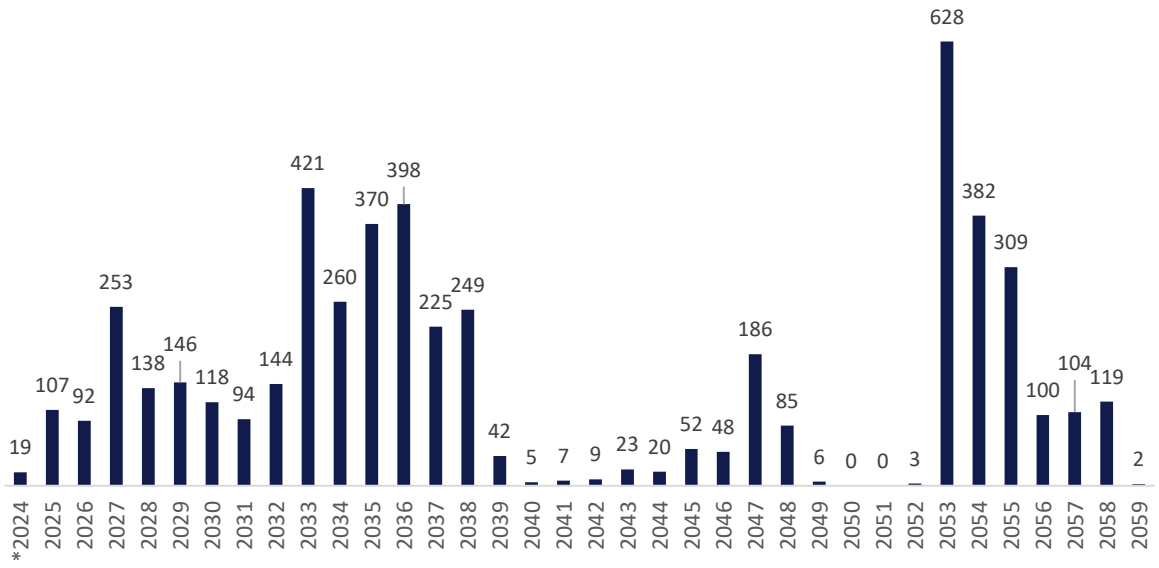
70. The current EPB system is broadly being implemented as intended. Things that are working well include that:

- TAs have made progress identifying potential EPBs, particularly in high seismic risk areas where identification is prioritised
- around 1,500 EPBs have already been remediated
- the EPB methodology has improved national consistency compared to the pre-2017 regulatory system, which had seen inconsistent approaches to managing seismic risk.

71. Despite this progress, until the 2024 deadline extension,[7] it was likely that many other EPBs would not meet their remediation deadlines. According to the EPB register at the time, 107 EPB remediation notices reached their deadlines in 2025 (including 66 in Christchurch and 33 in Wellington) and 242 in 2027 (of which 178 were in Wellington). Wellington City Council has estimated that at least 63% of EPBs in its area were at risk of not being remediated in time.

72. The size of this issue is likely to increase as more EPBs are identified, in line with the 2027 and 2032 deadlines in medium and low risk zones respectively (see Figure 5 below).

Figure 5: EPB remediation deadlines prior to the 2024 deadline extension



* The 19 EPB notices in 2024 were included in the deadline extension

[7] To reduce immediate pressure on building owners, in 2024 the Government extended all current remediation deadlines by four years (except buildings with notices that expired on or before 1 April 2024). TAs were also granted a one-off power to further extend remediation deadlines by up to two years, if required.

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3.2. The barriers to remediation are varied, but often relate to finance

73. In our view, further remediation deadline extensions are unlikely to make much difference because of the significant barriers to remediation that many EPB owners face. These are summarised below, and then discussed in more detail.

A. Remediation can be disruptive, beyond the means and/or capability of the building owner(s), or simply uneconomic.

- Building owners must weigh up the cost and difficulty of remediation against the benefits of continuing to use the building. Sometimes the case doesn't stack up.

B. The market's preference for more resilient buildings drives up costs and makes getting finance more difficult.

- Market demand for seismic resilience exceeds regulatory standards, but many owners cannot afford that level of strengthening. As a result, owners struggle to access financing, insurance, or secure tenants.

C. Some buildings are being vacated or strengthened in disproportion to their risk.

- Reasons for this relate to societal/staff expectations, health and safety concerns, and the way that %NBS is being used outside of the EPB system.

D. Many buildings being captured by the EPB system are not the types originally intended.

- The EPB system is losing focus on buildings that pose the greatest life safety risk. Lower-risk buildings, such as timber frame with minor masonry elements, are increasingly being captured.

E. Enforcing remediation deadlines is costly, time-consuming, and impractical for territorial authorities.

- TAs face major challenges in enforcing compliance. The tools currently available require lengthy legal processes and substantial upfront funding, making enforcement at scale very difficult.

F. Heritage rules pose additional barriers.

- The restrictions imposed by heritage status make demolition, change of use or substantial alteration more complicated and expensive.

G. The %NBS measure is not meeting the needs of the market.

- %NBS was intended as a measure of life safety risk, but is often being used in ways that extend well beyond its regulatory function.

A. REMEDIATION CAN BE DISRUPTIVE, BEYOND THE MEANS AND/OR CAPABILITY OF THE BUILDING OWNER(S), OR SIMPLY UNECONOMIC

74. Factors that can pose barriers to remediation include:

- difficulties in understanding seismic assessment results, remediation options, and the implications and limitations of seismic ratings
- inability to afford or secure finance for seismic assessments, project planning, or remediation
- inability to secure insurance, or uncertainty as to what strengthening standard is needed to satisfy insurers post-remediation

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- difficulties in accessing appropriate advice and engineering expertise
- perceptions that the regulatory requirements have changed or will change, requiring remediation to be undertaken again in the future.

75. These are 'base level' barriers which apply, to some degree, to many buildings and ownership arrangements. Even when they are surmounted, however, additional barriers may also apply, as discussed below.

Getting the work done can be very disruptive

76. EPBs are spaces for working and living. Closing these buildings for remediation work means they are not available to perform that function. In the case of:

- apartments, the residents need somewhere else to live
- commercial premises, the work must be done elsewhere (which is particularly difficult for retailers and small businesses).

77. Central government buildings that can be earthquake-prone include hospitals, schools, fire stations, and prisons. Local councils also own EPBs, which may include their own offices as well as community halls, libraries, and stadiums. Closing these buildings for remediation can cause significant disruption to community service provision, and is not possible when the building must remain in use (such as with schools, hospitals and prisons).

Sometimes remediation is simply uneconomic

78. The EPB system is focused on the risk posed by buildings, regardless of who owns them. There is no discretion available for instances of financial hardship, residential, not-for-profit or small business use. But some building owners are in a much better position to remediate than others, as there is a commercial case for doing so. In other cases, the building owner would be better off walking away than getting the work done.

Case Study 1: Commercial Building - 102 High Street, Dannevirke

This retail store has been home to a small owner-occupier IT business since 2014. Tararua District Council issued an earthquake-prone building notice in December 2023, and the building must now be remediated by June 2035.

The owner purchased the property for $50,000, but estimates strengthening work could cost $200,000. In contrast, demolition works could cost $60,000 but, without the store to run their business from, the owner does not know how they would pay these costs.

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The EPB system requires all building parts rated under 34%NBS to be remediated, regardless of the individual risk each part poses

79. The EPB system imposes an 'all or nothing' approach to remediation. If a building owner can't afford to strengthen all building parts that require remediation, there is no pathway to enable them to address the highest risk elements first. For small commercial or heritage building owners, this can prevent any remediation being carried out.

80. Furthermore, seismic remediation work can also trigger the 'substantial alteration' provisions of the Building Act 2004. If a building consent is sought for seismic remediation, fire safety and disability access improvements may also be required. This scale of work is not financially feasible for some building owners, so none of it gets done.

Apartment owners face additional barriers

81. Owners of apartments in EPBs must also contend with the following:

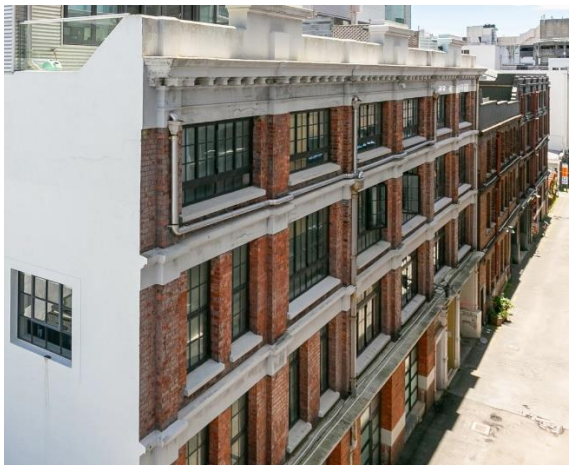
- stress and mental health challenges associated with planning and carrying out complex and expensive strengthening work on their own homes
- difficulties making collective decisions due to differing personal and financial capabilities, and differing opinions on solutions
- the requirement for reinstatement insurance (as required under the Unit Titles Act 2010), forcing owners to remediate their building beyond the regulatory minimum, at extra cost
- an older demographic profile, which can make it difficult for them to obtain finance due to their limited future earning potential.

Case Study 2: Residential Apartment Building - The Tea Store, Wellington

This residential apartment building on 20 Egmont Street was confirmed earthquake-prone in 2008, with a deadline for remediation of 31 January 2023. As the building's deadline expired prior to 2 April 2024, the owners did not qualify for the extension to earthquake-prone deadlines. The building is also scheduled as heritage on the district plan.

The building previously underwent some strengthening when the residential conversion took place 25 years ago. Despite concerted efforts from the body corporate and owners, remediation under the current system has not yet been undertaken. The strengthening work required exceeds $10 million, which is unaffordable for the owners and does not guarantee they will be able to secure insurance post-remediation. Building owners have struggled to reach consensus and have received conflicting advice from multiple engineers.

The building owners continue to experience mental health and wellbeing challenges as they potentially face prosecution and eviction from their homes, despite spending almost $900,000 on engineering advice.



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B. THE MARKET'S PREFERENCE FOR MORE RESILIENT BUILDINGS DRIVES UP COSTS AND MAKES GETTING FINANCE MORE DIFFICULT

82. The market preference for more resilient buildings is driving owners of EPBs and other buildings to strengthen beyond the regulatory minimum of 34%NBS. This is not inherently problematic, as safer buildings are desirable. But it can be an issue when the cost of remediation is disproportionate to the actual risk.

83. For some building owners, strengthening to a seismic rating beyond 34%NBS is not financially viable. But remediating to the regulatory minimum can also be uneconomic – as the property's value will likely remain low despite the significant capital expenditure. This is further compounded by the likely challenges obtaining insurance post-remediation.

Tenants are showing a preference for buildings with higher %NBS ratings as a proxy for resilience

84. Tenants in high seismicity areas, particularly commercial tenants, consider the risk of the buildings they occupy from a range of perspectives, not just life safety. For example, tenants often look for high resilience so they can return to their usual activities after an earthquake sooner. Central and local government agencies are often also compelled to strengthen significantly higher than the regulatory minimum, either owing to the critical nature of their buildings or public/staff expectations.

85. Building owners or tenants are using seismic assessments to inform purchasing or occupancy decisions, and some are adopting "minimum %NBS" policies to guide this decision-making. Using a building's %NBS rating as a proxy measure for a building's expected resilience (rather than as a measure of life safety) can lead to higher strengthening costs than are arguably warranted.

Insurers are also driving requirements beyond the regulatory minimum – if they offer any coverage

86. Insurers are also driving the market towards more resilient buildings. They use factors beyond a minimum %NBS, such as geotechnical data, building type, date of construction, building height, and peak ground acceleration when considering whether to insure seismically vulnerable buildings.

87. Local insurance companies are reliant on an aggregate coverage limit that is agreed with overseas reinsurers. This can mean that their willingness to offer insurance is depends on their existing risk exposure in that location, in addition to individual building characteristics. If the insurer is already exposed to risk from similar buildings in the area, it may decline to extend coverage.

And because banks require insurance, remediation loans can be inaccessible, or higher than they need to be

88. Lenders try to support their customers pragmatically, but ultimately make decisions based on whether the building owner can afford to repay the loan, and whether they will have sufficient security. It would be unusual for insurance providers to guarantee future coverage before remediation work takes place. This can create a situation where building owners can't secure finance for remediation without a guarantee of insurance – which insurers will not provide.

89. Banks are aware of the difficulties faced by residential apartment owners, and some issue loans for strengthening work above 33%NBS to existing customers. But they limit risk exposure by not approving loans for new customers who only seek a 34% seismic rating. For commercial properties, lenders are more likely to seek a rating closer to 67%NBS (in line with insurers' preferences).

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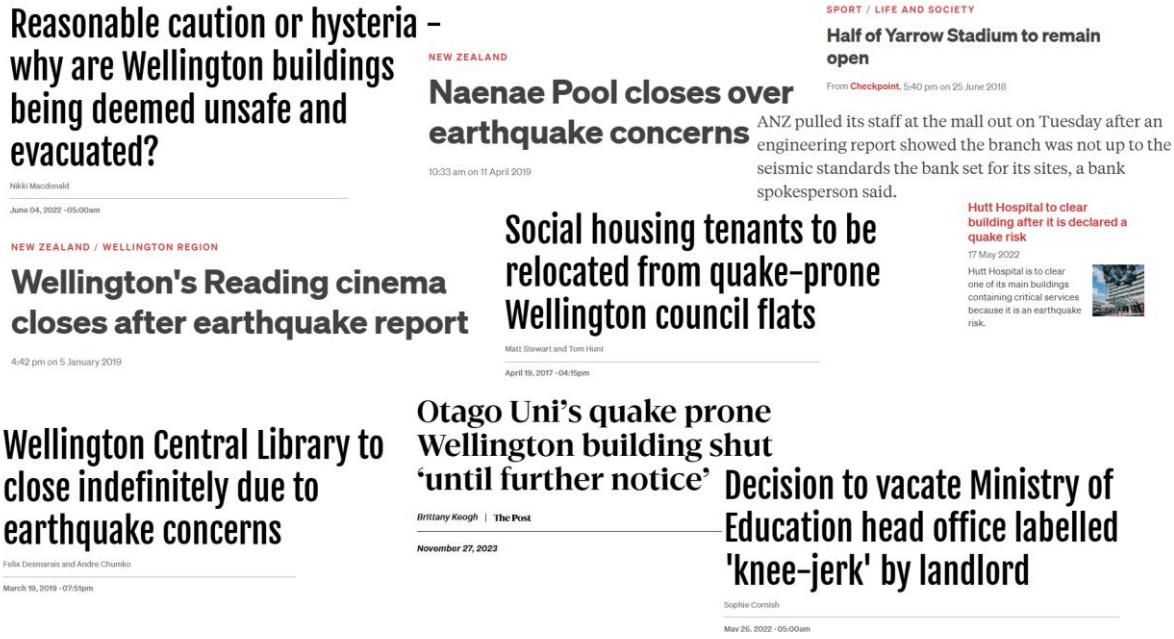
C. SOME BUILDINGS ARE BEING VACATED OR STRENGTHENED IN DISPROPORTION TO THEIR RISK

Some organisations are vacating buildings that are not imminently dangerous

90. Buildings with low seismic ratings are generally safe to use day to day, and there is no legislative requirement to vacate a building either before or after an EPB deadline expires. But there have been numerous media reports of building users vacating buildings following a seismic assessment that provides a low rating (see Figure 6 below). This includes both EPBs and buildings with a more moderate %NBS rating, ie above 34%NBS but below 67%NBS.

91. Public organisations in particular have shown very low risk tolerance by refusing to tenant buildings with low seismic ratings, and in some cases vacating them with little or no notice even though the building's seismic rating is above 34%NBS. This behaviour arguably influences expectations in the wider market.

Figure 6: Media reports of reactions to low sesmic ratings between 2017 and 2023



Organisational risk aversion is in part driven by perceived Health and Safety obligations

92. One reason for this is obligations under the Health and Safety at Work Act (HSWA) 2015 on "persons conducting a business or undertaking" (PCBUs) to ensure the health and safety of workers. The penalties for breaching those obligations are key drivers for commercial building owners and tenants to reduce seismic risk. This includes buildings that aren't EPBs.

93. In some cases, however, the actual risk to occupants may not be especially high, given the low probability of a large earthquake occurring (see Figure 7 below). In these cases, the consequences of immediate building closure may be disproportionately disruptive to key service providers, building users, and the wider community – and where public organisations are concerned, unnecessarily costly to the taxpayer.

94. One of the Government's objectives is to address "over-compliance" by clarifying the boundaries between the HWSA and other regulatory systems. As part of this, Cabinet has agreed to sharpen the coverage of the HSWA so that if duty holders comply with relevant requirements under other legislation (for example, the Building Act 2004) to manage a health and safety risk, the HSWA does not require a higher standard for the same risk.

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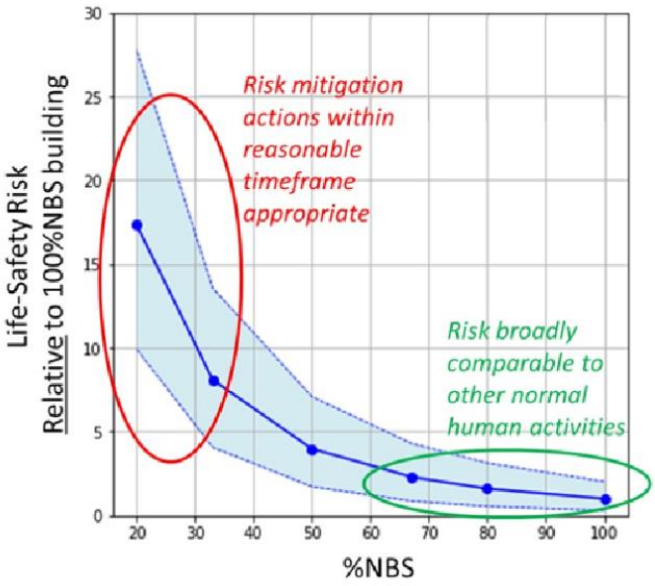
95. This change will clarify that PCBUs in charge of non-EPBs face no seismic health and safety obligations for those buildings.[8] MBIE will work with WorkSafe to ensure that clear guidance is made available. There is also a case that EPBs which are within their remediation timeframe should not fall within the orbit of the HSWA, as they are still compliant with the Building Act. This matter is more ambiguous, however, and we will explore it so that a clear position statement can be made to support the HSWA reforms.

Figure 7: Approximate life safety risk relative to 100%NBS building, the relationship is not linear despite public perception[9]



D. MANY BUILDINGS BEING CAPTURED BY THE EPB SYSTEM ARE NOT THE TYPES ORIGINALLY INTENDED

The 'at any time' pathway is being used more frequently than was intended

96. TAs must use three profile categories to identify potential EPBs:

    A. All unreinforced masonry buildings.

    B. Pre-1976 buildings that are three or more storeys high, or 12 metres or more in height.

    C. Pre-1935 buildings that are one or two storeys high.

97. A TA may also identify a building as an EPB at any time, if it receives information indicating that the building may be earthquake prone for any other reason. This is the 'identify at any time' pathway.

98. The original intent of the EPB system was that most EPBs would fall into one of the three profile categories and that the 'identify at any time' pathway would be used sparingly, to capture buildings outside of the profile categories with significant life safety vulnerabilities (such as the CTV building). But increasingly, it is not being used this way.

[8] Albeit, specifically to a building's structural integrity – PCBUs will retain obligations for building parts and contents (eg fixtures, fittings, plants).

[9] Zaidi, F., Elwood, K., Hulsey, A. A framework for incorporating fatality risk in seismic assessment methodology in New Zealand. *University of Auckland, Auckland, New Zealand*

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99. Buildings on the EPB register that fall outside the profile categories make up 39% of a recent survey sample (see Figure 8 below). Further, 18% of buildings in the sample are primarily light timber with some unreinforced masonry elements such as dividing walls or chimneys.

100. While the additional structures being designated as EPBs do exhibit structural weaknesses and design deficiencies, many do not fall within the "worst of the worst" category. This results in unnecessary costs and dilutes the system's intended focus. Examples of the kinds of buildings that are falling into the system are pictured in Figure 9 below.

Figure 8: Estimated profile categories from a survey of 2,565 earthquake-prone buildings in Auckland, Wellington, Christchurch, Dunedin, Feilding and Whanganui

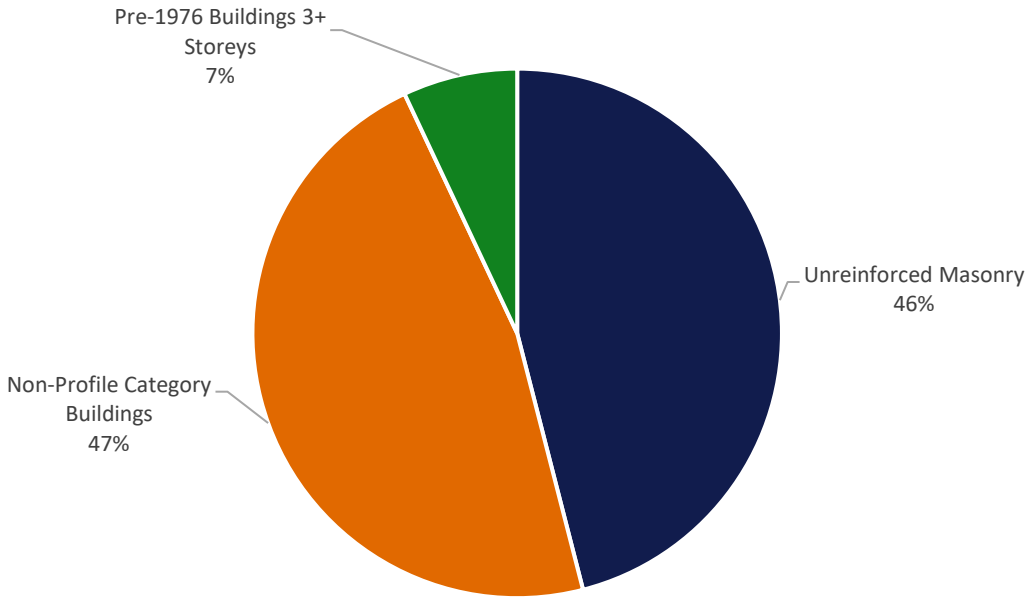

Figure 9: EPBs outside of the Profile Categories

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Some TAs are choosing to address building consent non-compliance through the EPB system

101. The New Zealand Society for Earthquake Engineering has noted that where market driven seismic assessments are revealing defective design or construction work after code compliance is certified, some TAs are using the 'identify at any time pathway' to resolve these issues in the absence of other ways to manage them. This is straining the intent of this pathway, as it doesn't directly relate to reducing seismic life safety risk.

E. ENFORCING REMEDIATION DEADLINES IS COSTLY, TIME-CONSUMING, AND IMPRACTICAL FOR TERRITORIAL AUTHORITIES

102. Ultimately, many EPBs that are not remediated before their deadline will be neglected or abandoned. TAs cannot prevent this and have reported that for some EPBs, vandalism and antisocial behaviour is leading to safety and security concerns. Some are addressing this at ratepayers' expense by boarding up windows or taking other security measures.

103. If an EPB deadline expires without remediation occurring, the TA can apply to a District Court for a fine of up to $300,000 (or $1.5 million for a body corporate), to strengthen or demolish the building and recover costs from the owner, or place a charge on the land.

104. TAs consider that these enforcement tools are unworkable. For example, if a TA wanted to carry out mandatory remediation, it would require a court process (including dealing with any appeals) and then the TA would need to fund and organise the work up front. Some remediation costs may eventually be recovered, but this is far from guaranteed.

105. The large cluster of EPBs expected to miss their remediation deadline in the same year or in close succession gives TAs an especially challenging EPB compliance and enforcement task. The challenge is especially evident in Wellington, where (prior to the recent extension) around 200 EPBs faced remediation deadlines in 2027. Wellington City Council estimated that at least 63% of these were at risk of not being remediated in time.

106. Compliance action to enforce strengthening or demolition on such a scale appears unworkable. Other TAs - most of whom have fewer resources than Wellington City Council - will likely face similar difficulties. Furthermore, in some cases, strengthening will not be cost effective, no matter who funds it. The only alternative is demolition. But once the buildings are gone, in many cases, they are unlikely to be replaced – leaving town centres with multiple vacant lots.

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Case Study 3: Buildings with Expired Deadlines - Toomath's Building and the Old Adelaide Hotel, Wellington

Wellington City Council applied to the District Court to remediate two heritage buildings with remediation deadlines that had expired in 2013, 43-47 Ghuznee Street (Toomath's building) and 114 Adelaide Road (the Old Adelaide Hotel).

The Council had attempted to work with the building owners on developing a remediation plan, but ultimately resorted to applying to the District Court in 2019, which was declined. Their appeal to the High Court in 2021 was successful, and the Council was given the right to carry out seismic strengthening work and recover the costs from the building owners.

To-date, remediation of the Old Adelaide Hotel has not been carried out due to the costs involved, and the building remains empty and decaying. The Toomath's building was ultimately demolished after it was set alight.

Old Adelaide Hotel *Toomath's Building*

F. HERITAGE RULES POSE ADDITIONAL BARRIERS TO REMEDIATION

107. There are approximately 800 heritage earthquake-prone buildings scheduled on District Plans throughout New Zealand.

108. The RMA designates the protection of historical heritage as a matter of national importance, and requires TAs to recognise and protect historic heritage, including earthquake-prone buildings, from inappropriate subdivision, use and development. TAs must approve any work that could affect the building's historical value.

109. The restrictions imposed by heritage status pose additional barriers to seismic remediation.

- Heritage rules make demolition, change of use or substantial alteration more complicated and expensive. For example, the resource consent process can be time-consuming and is subject to legal challenge. The risk of being declined, or being approved but still facing potential appeals that can delay projects for months or years, disincentivises owners from even commencing the process.
- Regional differences in how heritage rules are applied leads to an uncertain environment and limited redevelopment opportunities.
- There is a lack of funding, support and advice for owners. Programmes that helped reduce the financial burden of remediation and provided support to navigate the planning and strengthening processes have been discontinued.
- Remediation costs compound when buildings fall into disrepair. Some heritage buildings are suffering from 'demolition by neglect', where owners wait until the building becomes dangerous enough to require demolition under the Building Act.

110. The 2016 Act recognises the difficulty and high cost of retrofitting heritage buildings. Owners of Category 1 Heritage Buildings (listed in the New Zealand Heritage List or National Historic

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Landmarks) may apply for a remediation extension of up to 10 years. But the building must still have its earthquake risk reduced, and a TA may impose more conditions.

Case Study 4: Heritage Buildings - Drews Avenue Precinct, Whanganui

Ridgway Chambers - 29 Ridgway Street
Constructed in 1877, Ridgway Chambers is the oldest commercial structure in the heart of Whanganui. It has been home to a diverse range of business tenants.

Stevenson's Building - 42-44 and 38-40 Drews Avenue
Adjacent to Ridgway Chambers, is Stevenson's Building, built in 1900. This building was a hub for legal professionals and architects.

The remediation of these buildings has revitalised the precinct, reduced antisocial behaviour, and generated substantial financial returns to local and central government.

These buildings had been vacant, derelict and unproductive for up to a decade, attracting antisocial behaviour, graffiti and littering. The buildings on Drews Avenue received a total $178,451.25 funding from the now discontinued Heritage EQUIP programme, with total restoration costs exceeding $3 million, which went into the local economy.

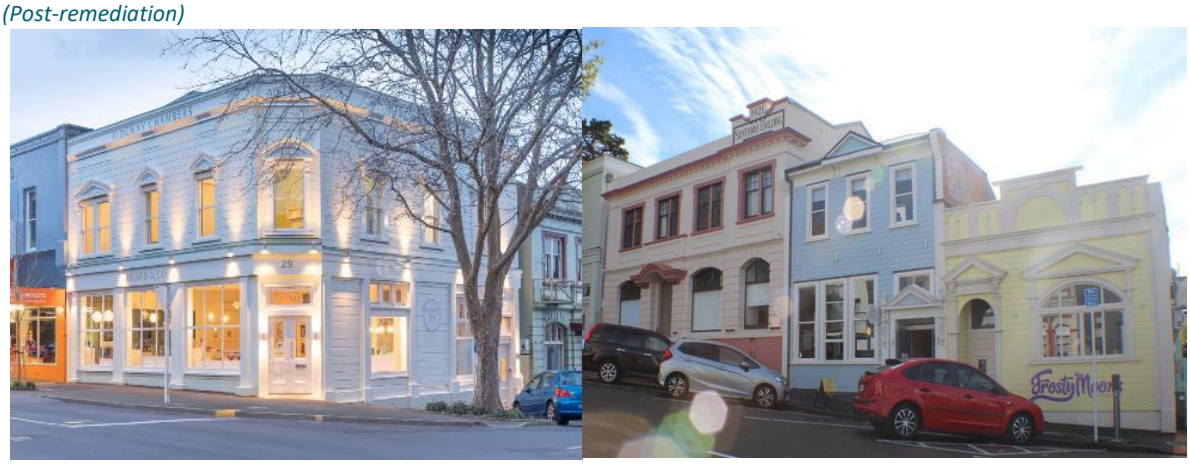
Since remediation, these buildings now house multiple businesses employing approximately eight FTE and six upper floor apartments. The buildings have attracted younger clientele and residents, and generated interest in further redevelopment work in the precinct. It is estimated that the tax intake from these now productive buildings is four times higher than the grant awarded by Heritage EQUIP.

The Heritage EQUIP programme has been attributed as an essential source of support and advice to overcome the numerous unexpected challenges and difficulties arising in the remediation process.

Ridgway Chambers *42-44 Drews Avenue* *38-40 Drews Avenue*

(Pre-remediation)

(Post-remediation)



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RMA reform may impact some heritage related issues

111. The Government's RMA reforms may have implications for heritage buildings and some of their barriers to remediation. The Expert Advisory Panel on Resource Management Reform recommended that historic heritage, notable trees and archaeological sites be removed from planning legislation and wholly dealt with under the Heritage New Zealand Pouhere Taonga Act 2014 and by Heritage NZ. The nature and extent of any changes is not yet clear, however.

G. THE NEW BUILDING STANDARD (%NBS) MEASURE IS NOT MEETING THE NEEDS OF THE MARKET

%NBS can be misunderstood by the public

112. %NBS is focused only on life safety. But it is often used in ways that extend well beyond its regulatory function – eg to support building occupancy decisions, in real estate advertising, and by lenders and insurers (including for non-EPBs). %NBS differs from how many people perceive it. For example:

- the aim of the %NBS metric is to provide a relative assessment of seismic risk - it is not a predictor of building failure in any particular earthquake
- while a low %NBS rating does indicate a heightened life safety risk if an earthquake occurs, it does not mean that the building is imminently dangerous
- buildings with higher %NBS ratings (such as 67%NBS) are not necessarily more resilient to earthquake damage in terms of availability for continued use and repairability
- the %NBS goal posts for existing buildings have not changed - assessments of earthquake-prone buildings must continue to use the seismic assessment guidelines and loading standard from 2017.

Misconceptions about the role and function of the %NBS rating such can lead to poorly informed building occupancy or closure decisions

113. There is an inherent level of subjectivity involved in individual building assessments, with the application of different engineering skills and experience leading to different results. But overall, the tendency has been towards conservatism. Sapere's review of the current EPB system found that it incentivises risk aversion across many levels. For example, engineers often err on the side of conservatism when assessing a building, and TAs are disinclined to challenge these assessments. Neither party wants to be responsible for death or injury related to that building in an earthquake.

%NBS doesn't necessarily reflect a building's overall life safety *hazard*

114. A building's %NBS rating is the minimum of the %NBS scores (on components) for the building (assuming all %NBS scores relate to a "significant life safety hazard"). But this does not always accurately reflect its *overall* life safety hazard, especially when compared against another building. For example, a low-rise timber building may receive a 30%NBS rating due to a part in a rarely used area, while a critical supporting column in a larger and more densely occupied building may also receive a 30%NBS score. Both buildings would face the same statutory obligations and timeframes, despite their differing risk to life safety (see Figure 10).

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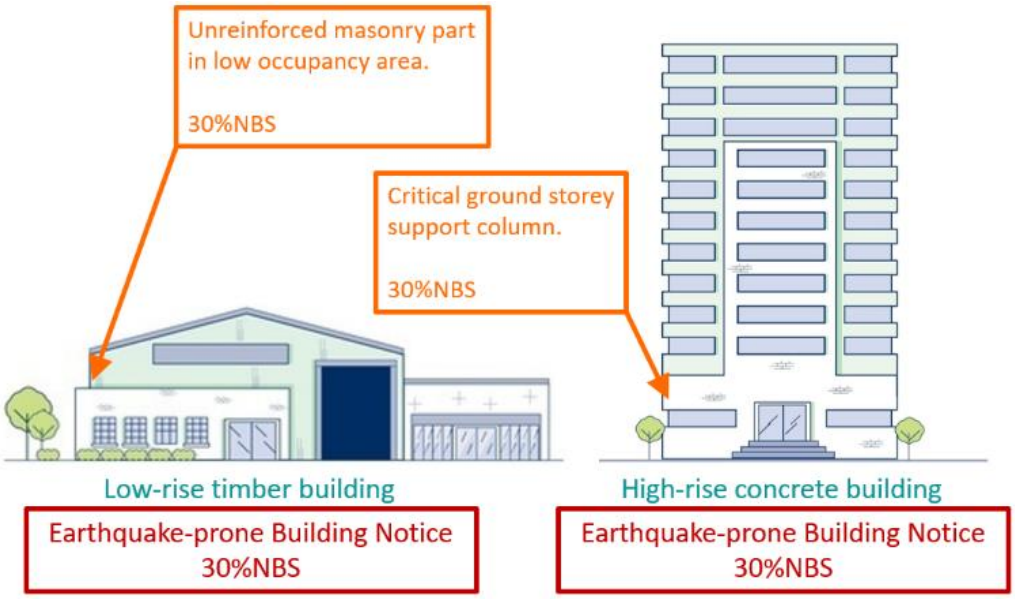
Figure 10: Uniform application of %NBS to different buildings and vulnerabilities



Nor does %NBS capture updated seismic assessment guidelines

115. Engineers are required to use Seismic Assessment Guidelines published on 1 July 2017 when undertaking a seismic assessment of a building for the purpose of considering whether it is an EPB. This is to ensure that the goalposts don't keep shifting and that once a building is deemed to be no longer an EPB, it stays that way.

116. But research and experience since 2017, along with lessons from the 2016 Kaikoura Earthquake, mean the 2017 Guidelines no longer always represent best practice. Voluntary non-EPB Guidelines, most recently updated in 2025, can be used for seismic assessments of non-EPBs. This has created inconsistency between the EPB system and market demand for voluntary seismic assessments outside the EPB system.

117. There are numerous examples of building owners and tenants, particularly in Wellington, vacating buildings or planning extensive strengthening work following completion of seismic assessments using the updated voluntary (non-EPB) Guidelines. In this context, vacating the building could arguably be unnecessary and not proportionate with the risk. Strengthening the building is more likely to be a desirable outcome, but the perceived requirement to do so despite the building not being an EPB does illustrate the growing complexity of operating 'fixed in time' and evolving assessment methodologies at the same time.

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4. We have identified four high-level options for change

4.1. We propose a more targeted and proportionate approach to mandatory remediation, with a continued focus on life safety

118. The primary objective for the EPB system under the 2016 Amendment Act is to mitigate the risk to life safety in earthquakes for vulnerable existing buildings, with supporting objectives to be efficient and proportionate by prioritising remediation for buildings in higher risk areas, and allowing more time to address buildings in lower risk zones.

119. The "willingness to pay" report prepared by Resilient Organisations supports retaining this primary objective, rather than extending the primary objective to include reducing damage and disruption from earthquakes. It concludes that society continues to place life safety as the most important building performance attribute.

120. We therefore propose to retain reducing life safety risk in existing buildings as the primary system objective. In consideration of the remediation barriers faced by EPB owners, we also propose an increased emphasis on reducing life safety risk in a way that is proportionate to the consequences of building failure.

121. We have assessed the policy options against the criteria set out in Table 2 below. The criteria are equally weighted and, taken together, aim to highlight the option(s) that will prove most effective, proportionate and workable in practice.

Table 2: Criteria for assessing proposed changes to earthquake-prone building system settings

Criteria	Explanation
Effective - at reducing life safety risk in existing buildings	An effective system is one that results in high-risk buildings being remediated. A system that requires this in law but is unworkable in practice will not be effective.
Proportionate - intervention is proportionate to the risk posed	The impact of the regulatory imposition (eg on people's autonomy, costs and property rights) should be commensurate to the life safety risk involved.
Efficient – building owners' costs relate solely to reducing seismic risk	A system that imposes costs on building owners that don't directly relate to remediation (eg assessments, TA paperwork, legal fees) will not score highly against this criteria.
Certain – building owners' obligations are clear so they have confidence to carry out remediation work	Building owners know exactly what kind of remediation work their building requires, and have confidence that the goalposts will not shift over time.
Administratively simple - the system is simple to administer, and the costs of doing so are reasonable	Entities involved in administering the system (eg TAs, MBIE, engineers) are clear about their role, and can undertake it with a minimum administrative burden (to implement and enforce the changes).

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PROPORTIONATE IN THIS CONTEXT MEANS RESPONSIVENESS TO THE THREE ELEMENTS OF SEISMIC RISK…

122. Seismic risk in buildings is fundamentally comprised of three components:

- *Seismic hazard likelihood* – the probability of a moderate to large earthquake in that area (ie its seismic zone).
- *Building vulnerability* – the presence of weaknesses in the building structure that can lead to partial or complete structural failure in the event of an earthquake. Profile categories A, B, and C[10] in the current system identify buildings which have demonstrated high vulnerability in past earthquakes.
- *Consequence* - the exposure of people to injury or death in case of building failure (ie the number of people who stand to be impacted). There are also wider life safety consequences due to failure of buildings critical for emergency response (eg hospitals), as they will be particularly important after a large earthquake.

123. The current system implicitly factors in all three:

- Timeframes for identifying and remediating EPBs differ by the seismic zone they occupy.
- %NBS ratings depend on the hazard and the building vulnerability.
- When determining %NBS for building components, engineers are required to factor in whether any identified vulnerability poses a significant life safety hazard (ie two or more people exposed to life safety risk in the event of component failure).

124. But nonetheless, there is scope to leverage these factors more, so the regulatory requirements are more proportionate to the overall life safety risk. In particular, while using the three seismic zones is still a good way to categorise *seismic hazard likelihood* for EPB purposes:

- More focus on the 'worst of the worst' buildings could result from more specific provisions in relation to *building vulnerability.*
- The system can focus more on the likely *consequence* from building failure (by considering the level of building use/occupancy, and hence the potential number of casualties).

… AND KEEPING COSTS PROPORTIONATE TO THAT RISK

125. Many international seismic risk mitigation programmes have developed retrofit guidance for specific vulnerable building types, to optimise the level of risk reduction against cost. Best 'bang for buck' can be achieved by developing a retrofit scheme which targets the vulnerabilities that contribute most to life safety risk. As per the '80/20' rule, relatively simple and cost-effective interventions can make a big difference for some types of structures and prevent many potential fatalities.

126. Considering each of these three components of seismic risk enables a more proportionate range of mitigations. They range from only posting a notification of the risk to inform building users in the case of buildings with lower risk, to some retrofitting targeting only the worst vulnerabilities for buildings with somewhat higher risk, and finally retrofits to the EPB threshold (as per current requirements) for buildings with the highest risk (see Figure 11 below).

[10] Category A - Unreinforced masonry. Category B - Pre-1976 construction that is three story or 12m high. Category C - Pre-1935 construction that is one to two storeys high.

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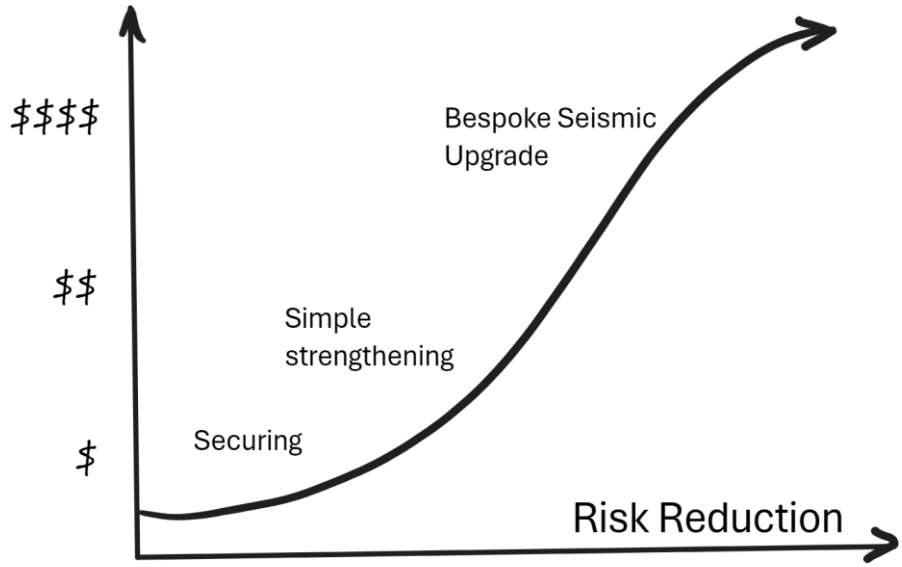
Figure 11: Indicative cost progression and risk reduction for different levels of strengthening



127. Accordingly, we refer to two standardised lower-cost retrofit approaches in the options as follows:

- *Targeted retrofits* – target specific vulnerabilities with the highest life safety risk. For URM buildings, *façade securing* is a form of targeted retrofit which addresses the risk of façades, exterior walls, and parapets falling on people and vehicles directly outside the building. The Joint Committee for Seismic Assessment and Retrofit (Joint Committee) is working to identify targeted retrofits for reinforced concrete buildings.[11]
- *Simple Strengthening* – provides an easier to implement "acceptable solution"[12] or standardised retrofit for most one and two storey URM buildings. Such buildings tend to have a similar design and layout, so a standardised retrofit achieving a comparable risk reduction outcome to that of a 34%NBS retrofit can be implemented. The Joint Committee is developing a Simple Strengthening Guideline for these buildings. Taller URM and concrete buildings significantly differ in design and complexity, however, making simple strengthening unviable.

128. The number of buildings for which these methodologies could be used as acceptable retrofit solutions increases with each option set out below, with Option 3 allowing for the most flexibility in the mitigation option applied.

[11] MBIE has commissioned a study by Holmes Consulting to explore how Targeted Retrofitting can be applied in practice, particularly for concrete buildings. This study will inform the detailed policy design phase.
[12] "Acceptable Solutions" give specific construction details, often for commonly used building materials, systems and methods. Designs based on them must be accepted by Building Consent Authorities as demonstrating compliance with the Building Code.

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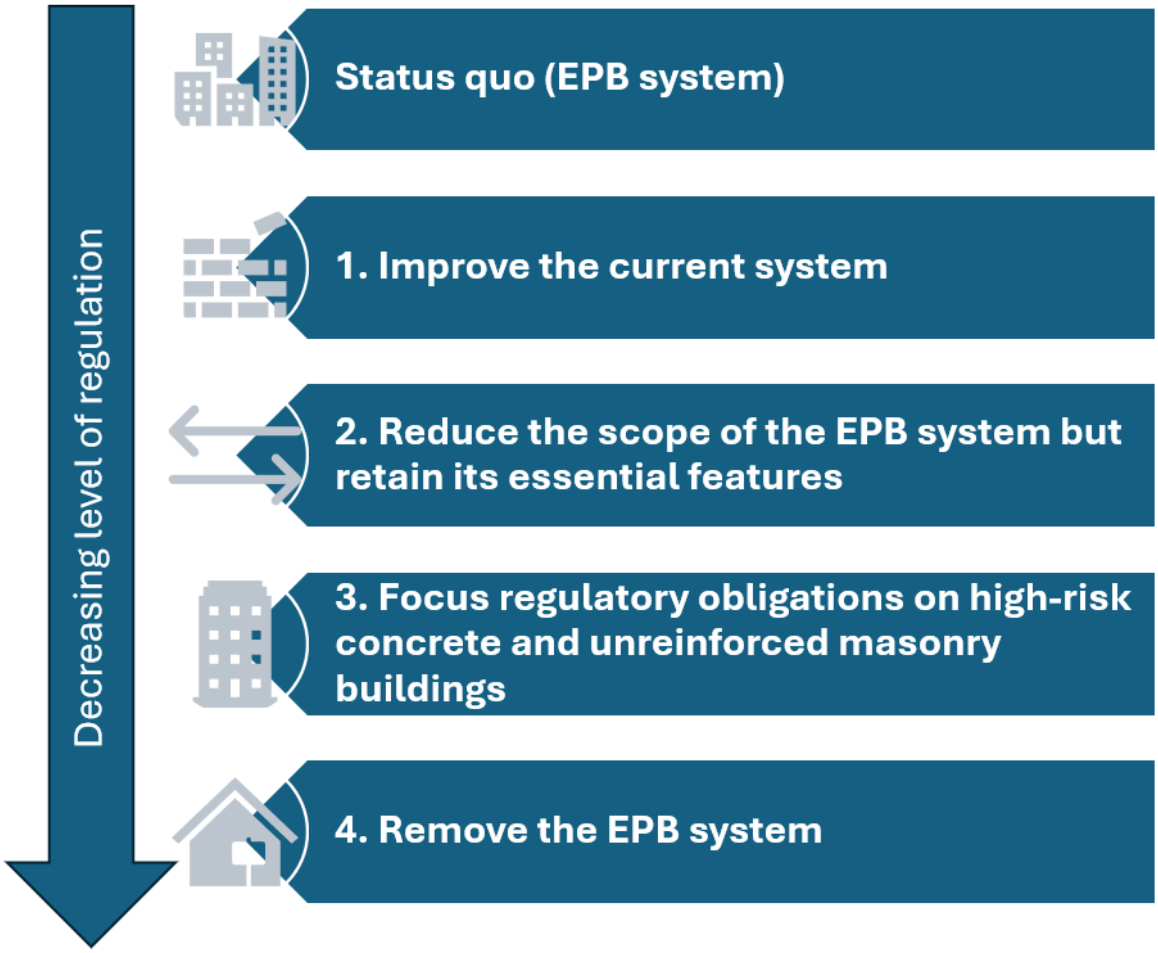
4.2. Options we considered range from incremental improvements to removing the current regime entirely

129. The options we have considered are set out in Figure 12 below:

Figure 12: Options for change



130. Options 1 and 2 focus on refining the current system and reducing the number of buildings that must meet EPB requirements, with Option 2 providing more significant regulatory changes. Option 3 offers a more risk-based and targeted approach, reducing the scope of mandatory remediation based on the life safety risk of the building. Option 4 removes the EPB system altogether and relies on non-regulatory / market forces to drive risk mitigation across all existing buildings, including former EPBs.

131. Options 1 and 2 retain the %NBS scale to identify whether buildings are earthquake prone, while options 3 and 4 remove it and instead rely on a binary model to identify EPBs (ie a building is either an EPB or not).

132. Figure 13 below shows that the options progressively reduce the number of buildings on the EPB Register. Figure 14 below shows the potential cost reduction to retrofit buildings that would retain EPB designation. These are indicative estimates – more precision about buildings in the EPB inventory and estimated cost reductions will depend on the final policy design.

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Figure 13: Estimated proportion of buildings removed from the EPB Register

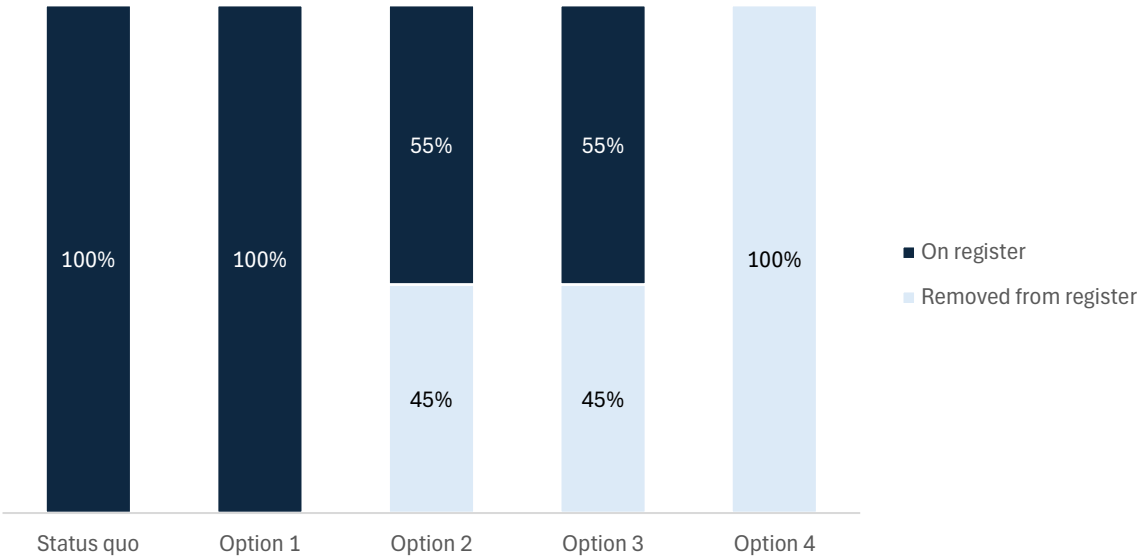
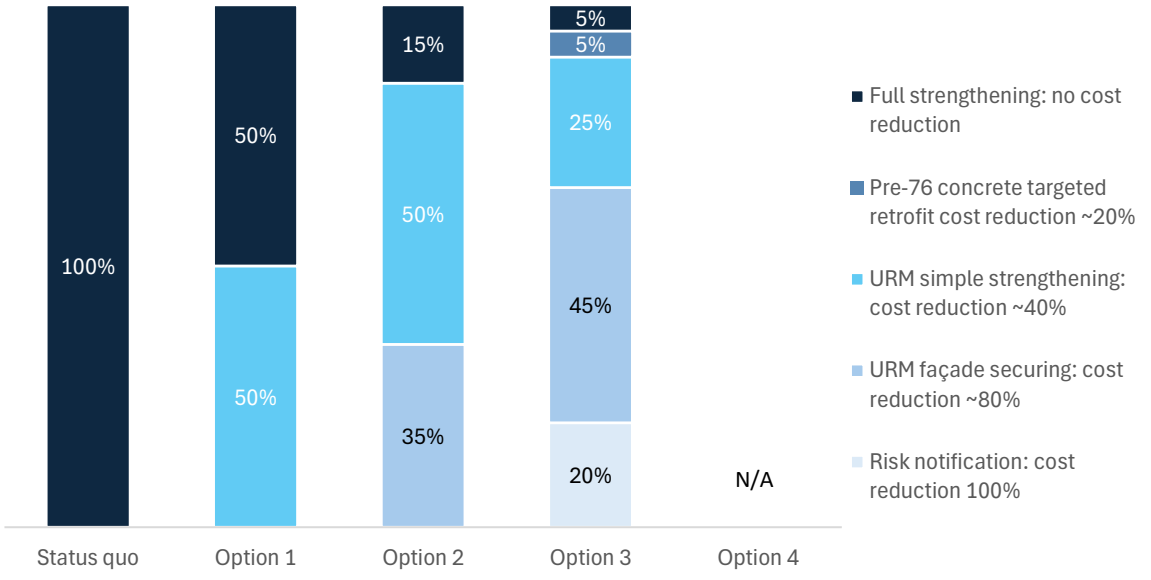


Figure 14: Estimated reduction in retrofit cost for the buildings that stay on EPB Register



4.3. Option 1: Improve the current system

133. Option 1 involves the least amount of change and retains the highest level of regulation of the four options discussed below. Its focus is on refining the current system and reducing the future number of EPBs by focusing on how system settings are applied by TAs and engineers.

134. It would see targeted refinements to the current regulatory framework that aim to reduce the number of buildings classified as EPBs in the future. The changes would primarily be achieved through adjustments to the EPB Methodology and Engineering Assessment Guidelines. Amendments to the Building Act 2004 would not be required. Its key elements are:

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- clarification of the 'at any time' pathway – clearer guidance would be provided to ensure that voluntary seismic assessments commissioned by building owners (ie for buildings outside the profile categories) with ratings below 34%NBS do not automatically trigger an EPB classification unless the building presents a high risk
- refining scope of 'Parts' - the definition and assessment for building 'Parts' would be narrowed to focus only on heavy elements such as parapets that have a higher likelihood of failure under moderate seismic activity and could impact multiple people
- excluding buildings or areas of buildings with low and infrequent occupancies from EPB obligations
- facilitating removal of EPB notices by:
  - enabling more cost-effective retrofits for simple strengthening of one or two storey URM buildings
  - enabling the use of latest engineering knowledge (ie updates of Seismic Assessment Guidelines issued after July 2017) to re-evaluate earlier assessments and for retrofitting to demonstrate a building is not EPB
- introducing the use of new engineering statements for low risk building typologies, avoiding the need for full reassessment.

135. Seismic assessments and %NBS ratings would still be used to determine whether buildings are earthquake-prone or not. The proposed adjustments would maintain current use of seismic hazard data and building vulnerability assessments, while placing greater emphasis on consequence (human exposure).

136. Under this option, approximately 46% of one to two storey URM EPBs would qualify for simple strengthening (which is about 40% cheaper than strengthening to 34%NBS). All other EPB owners would be required to fully strengthen their building to at least 34%NBS.

137. In future, we expect that fewer EPBs would be identified in Medium and Low seismic zones and that there would be a reduced assessment burden for TAs where EPB identification is ongoing.

138. Indicative impacts on the current stock of EPBs are outlined in Table 3 below:

Table 3: Option 1's indicative impacts on the current stock of EPBs[13]

Building typology	Requirement under option 1	Estimated cost reduction	Proportion EPBs (approx.)
Profile Category A: Unreinforced masonry buildings			**51% (2,800)**
1-2 storeys	Simple strengthening	~40%	46% (2,500)
3+ storeys	Retrofit to EPB threshold	N/A	5% (300)
Profile category B: Pre-1976 concrete buildings, 3+ storeys			
All profile category B	Retrofit to EPB threshold	N/A	4% (200)
Non-profile category: Other buildings			
All non-profile category	Retrofit to EPB threshold	N/A	45% (2,500)

[13] Provisional estimates – building numbers and cost reductions will depend on final policy design.

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139. Indicative impacts across building ownership types are outlined in Table 4 below:

Table 4: Expected impacts of Option 1 by building type

Building owner type	Impact
Residential apartment buildings	*Limited change* for those multi-storey buildings currently EPB or likely to be identified as potentially earthquake prone.
Commercial buildings	*Some reduction* in current and future EPBs for URM buildings in provincial centres and buildings in larger retail centres, and other buildings with lower risk façade elements.
Government agencies, Councils and Lifeline Utilities	*Significant reduction* in current and future EPBs for smaller, more infrequently used buildings and those with lower risk Parts.

4.4. Option 2: reduce the current system's scope but retain its essential features

140. This option would see legislative, regulatory and methodology changes to significantly reduce mandatory EPB assessments and strengthening requirements. It builds upon Option 1 by enabling removal of EPB obligations for buildings not considered high risk. The option:

- creates a mechanism to remove remediation obligations for most EPBs that are outside the Profile Categories, except for limited high-risk cases
- removes remediation obligations for lower risk buildings and allows low-cost façade securing retrofits for low-rise URM buildings in low seismic zones
- extends timeframes for:
  - low-rise buildings with limited exposure
  - priority buildings in medium and high seismic areas, except URM buildings.

141. Under this option, EPB owners could experience a remediation cost saving (compared to current requirements) of:

- 100% for the around 45% of current EPBs which would no longer be classified as an EPB (most of these are non-Profile Category Buildings)
- 80% cost savings for around 18% of URM buildings in low seismic zones would only require façade securing
- 40% cost savings for around 28% of current EPBs, by implementing simple strengthening techniques (URM one to two storey - medium and high seismic zones)
- there would be no cost savings for the remaining 9% as these buildings would require strengthening to 34%NBS.

142. Overall, this option removes or reduces obligations for many EPBs outside the Profile Categories. Most EPB owners would experience significant cost savings and nearly half would face no remediation costs at all.

143. The impact for various building types is detailed in Table 5 below. Towns and provincial centres would experience a considerable relaxation in requirements for URM buildings by enabling façade securing and some extended timeframes. There would be a notable reduction of EPBs in metropolitan centres due to the removal of most buildings outside the Profile Categories.

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Table 5: Option 2's indicative impacts on the current stock of EPBs

Building typology	Requirement under option 2	Estimated cost reduction	Proportion EPBs (approx.)
Profile Category A: Unreinforced masonry buildings			**51% (2,800)**
Low Zone, 1-2 storeys	Façade securing	~80%	18% (1,000)
Medium and High Zones, 1-2 storeys	Simple strengthening	~40%	28% (1,500)
All zones, 3+ storeys	Retrofit to EPB threshold	N/A	5% (300)
Profile category B: Pre-1976 concrete buildings, 3+ storeys			
All profile category B	Retrofit to EPB threshold	N/A	4% (200)
Non-profile category: Other buildings			
All non-profile category	Removed from register (subject to review)	100%	Up to 45% (2,500)

144. Indicative impacts across building ownership type are outlined in Table 6 below.

Table 6: Indicative impacts of Option 2 by building type

Building owner type	Impact
Residential apartment buildings	Pathway created for low-rise URM apartment buildings in low zones (current and future EPBs) that involves a significant reduction in scope of remediation work.
Commercial buildings	Some reduction in current and future EPBs for URM buildings in provincial centres, plus extended timeframes. Also for buildings in larger retail centres, and for a number of buildings outside the current Profile Categories.
Government agencies, Councils and Lifeline Utilities	Significant reduction in current and future EPBs for smaller, more infrequently used buildings and other buildings outside the Profile Categories.

4.5. Option 3: focus regulatory obligations on high-risk concrete and unreinforced masonry buildings

145. This option uses a risk-based mitigation matrix to ensure that mandatory remediation obligations are only applied to the highest risk buildings. This option uses standard criteria (eg structural system, number of storeys, and age) to identify EPBs, not individual building assessments. Accordingly, %NBS would no longer be used to identify EPBs.

146. Using a mitigation matrix to determine remediation obligations means they can be scaled according to risk appetite, and thus this framework can be used to create a continuum of options. The section below describes Option 3. Following that, we set out how Option 3 can be scaled, using two variants (3a and 3b) as examples.

147. There will be an initial administrative burden during the transition, including a significant effort to identify the structural typologies needed for transition, but once done we estimate that around 45% of current EPBs could be taken off the register with no further obligations and significant cost savings for their owners. Like Option 2, most of these would be buildings outside the Profile Categories, such as low-rise timber-framed buildings.

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148. This option uses an assessment of the risk to human life to determine the required mitigation action and achieve further cost savings for EPB owners. As discussed above, risk is fundamentally comprised of *seismic hazard*, *building vulnerability*, and *consequence of failure* (the exposure of people or response criticality).

149. While the current system requires the same mitigation action for all EPBs (ie retrofit to at least 34%), Option 3 allows for less costly mitigation actions as the risk to life decreases. It extends the use of seismic zones to inform the required level of remediation or risk disclosure. The scope of remediation obligations is also influenced by building vulnerability and consequence of failure.

- *Building Vulnerability*: We propose two broad vulnerability classes - *Lower* (non-EPB) and *Higher* (to be captured within the EPB system). The Higher Vulnerability class would be subdivided into buildings of three or more storeys (2A) and URM buildings (2B).

Class 1	**Lower Vulnerability (non-EPB) buildings**
Class 2	**Higher Vulnerability (EPB) buildings**[14]
	Class 2A – Multi-storey buildings • Pre-76 buildings, 3 or more storeys • Other buildings of heavy construction with *higher vulnerability* (typically 3 storeys or more)
	Class 2B – URM buildings

- *Consequence of failure*: Three levels of consequence which reflect the level of exposure of people in and around a building are defined in the following table. Category 3 includes buildings that are critical for emergency response (eg hospitals, emergency services).

Category 1	*Low* human exposure[15] inside and outside building (incl. other adjacent buildings)
Category 2	*Regular* human exposure
Category 3	*High* human exposure, or critical for emergency response

150. The three components of risk are represented in the mitigation matrices shown below (see Table 7), with a separate matrix applying to each seismic zone. The matrices indicate the required level of seismic mitigation consistent with the life safety risk posed by the building. Three increasing levels of required mitigation are considered for buildings with highest vulnerability in the matrices below:

- *Risk notification* – where risk to human life is relatively low, but the building is still of high vulnerability, it is required to post a notice on the building that it is earthquake prone, but there is no mandatory requirement to remediate.

[14] This approach relies on a clear and consistent interpretation and navigation of *Higher Vulnerability* being developed in the next phases of the option development.
[15] Guidance would be needed to provide definitions for *Low*, *Regular* and *High* human exposure categories. It is possible that proxies for low exposure, such as being in a small regional centre, could be used.

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- *Targeted retrofits*[16]– For cases where risk to human life is higher, an intermediate mitigation step is allowed. These target specific vulnerabilities with the highest life safety risk. For example, for URM buildings, façade securing addresses the risk of façades, exterior walls, and parapets falling on people and vehicles outside the building.
- *Retrofit to the EPB threshold* – For the highest risk buildings, remediation must meet or exceed the EPB threshold. This is consistent with the current requirements (where the threshold is 34%NBS). One to two-storey URM buildings could use simple strengthening techniques to meet the EPB threshold (see para 127).

Table 7: Mitigation matrices for a more risk-focused system

Low Zone matrix:

Increasing Building Vulnerability →

Increasing Consequence ↓

	Class 1 – Lower vulnerability buildings	**Class 2A – Vulnerable Multi-storey buildings**	**Class 2B – Vulnerable URM buildings**
Category 1 *Low exposure*	A – No mandatory requirements	B – Risk notification	B – Risk notification
Category 2 *Regular exposure*	A – No mandatory requirements	B – Risk notification	C –Targeted Retrofits
Category 3 *High exposure*	A – No mandatory requirements	C –Targeted Retrofits	D – Retrofit to EPB Threshold

Medium Zone matrix:

Increasing Consequence ↓

	Class 1 – Lower vulnerability buildings	**Class 2A – Vulnerable Multi-storey buildings**	**Class 2B – Vulnerable URM buildings**
Category 1 *Low exposure*	A – No mandatory requirements	B – Risk notification	B – Risk notification
Category 2 *Regular exposure*	A – No mandatory requirements	C –Targeted Retrofits	C –Targeted Retrofits
Category 3 *High exposure*	A – No mandatory requirements	D – Retrofit to EPB Threshold	D – Retrofit to EPB Threshold

High Zone matrix:

Increasing Consequence ↓

	Class 1 – Lower vulnerability buildings	**Class 2A – Vulnerable Multi-storey buildings**	**Class 2B – Vulnerable URM buildings**
Category 1 *Low exposure*	A – No mandatory requirements	B – Risk notification	B – Risk notification
Category 2 *Regular exposure*	A – No mandatory requirements	C – Targeted Retrofits	D – Retrofit to EPB Threshold (see para 151)
Category 3 *High exposure*	A – No mandatory requirements	D – Retrofit to EPB Threshold	D – Retrofit to EPB Threshold

[16] MBIE has commissioned a study by Holmes Consulting to explore how Targeted Retrofitting can be applied in practice. This study will inform the detailed policy design phase. Early development in this project suggests that there may be a mechanism to move more concrete buildings from "targeted retrofit" to "risk notification" if it can be confirmed that critical high-risk vulnerabilities are not present in the building. This could reduce the number of concrete buildings requiring targeted retrofit by approximately one to two thirds.

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151. For one to two storey URM buildings in consequence category 2 (regular exposure), indicated above as *Retrofit to EPB Threshold*, the owner could choose to implement façade securing only. If so, the building would remain on the EPB register and would need a risk notification notice posted. If the building owner voluntarily retrofitted the building to the EPB threshold, then the building would be removed from the EPB register and the risk notification could be removed.

152. For cases required to *Retrofit to EPB Threshold*, more time to fully meet retrofit requirements could be potentially provided if Targeted Retrofits are implemented as an interim measure. We will explore the feasibility of this, including from an engineering perspective, as part of the more detailed work to follow.

153. Table 8 below shows that under this option, EPB owners could experience significant remediation cost savings (compared to current requirements).

    - All remediation costs would be removed for around 55% of EPB owners, of whom:
        - around 45% of EPBs (all non-Profile Category Buildings) would be removed from the EPB Register
        - around 10% with low exposure (including small regional centres) would not have remediation obligations, and instead would be required to display an EPB notification to inform building occupants and visitors[17]
    - 80% cost reduction for around 25% of EPB owners to secure their façade (URM buildings in low and medium zones)
    - 40% cost reduction for around 15% of EPB owners using simple strengthening
    - around 20% cost reduction for around 3% of EPB owners to strengthen using targeted retrofitting for concrete buildings.

154. For around 2% of EPB owners, the location, typology and size of their building (often URM or multi-story concrete, including apartments) poses too great a life safety risk to occupants and people outside to justify reduced remediation requirements. At present there are few or no options for simpler or more targeted retrofits due to their complexity.[18] These buildings will still be required to remediate to the equivalent of 34%NBS. Support for building owners falling into this category is explored in the 'next steps' section of this report.

[17] The benchmark for low exposure is yet to be determined but would likely factor in population density and foot traffic. Small regional centres could be deemed low exposure without need for further assessment.
[18] MBIE has commissioned a study by Holmes Consulting to explore the performance of multi-storey concrete buildings in earthquakes and if it is feasible to further reduce the number of buildings in this category.

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Table 8: Option 3's indicative impacts on the current stock of EPBs

Building typology	Requirement	Estimated cost reduction	Proportion EPBs (approx.)
Profile Category A: Unreinforced masonry buildings			**51% (2,800)**
Low-Medium seismic zones: regular exposure	Façade securing	~80%	25% (1,400)
High seismic zone: low rise	Simple strengthening OR façade securing + risk notification	~40-80%	15% (850)
High seismic zone: mid-high rise	Retrofit to EPB threshold	N/A	1% (50)
All zones, low exposure	Risk notification	100%	10% (500)
Profile category B: Pre-1976 concrete buildings, 3+ storeys			**4% (200)**
Low seismic zone: regular exposure	Risk notification	100%	<1% (<50)
Low seismic zone: high exposure Medium-High seismic zones: regular exposure	Targeted retrofit	~20%	3% (150)
Medium-High seismic zones: high exposure	Retrofit to EPB threshold	N/A	1% (50)
Non-profile category: Other buildings			**45% (2,500)**
All zones	Removed from register – ~5% subject to review (see para 189)	100%	40-45% (2,200-2,500)

155. Table 9 shows the expected impacts across building ownership type:

Table 9: Indicative impacts of Option 3 by building type

Building owner type	Impact
Residential apartment buildings	Some URM 1-2 story apartments will not be required to remediate, and others will be able to do so via façade securing rather than full strengthening.
Commercial buildings	Significant reduction in current and future EPB for URM buildings in provincial centres, and a large reduction in the number of current and future EPBs.
Public agencies, Councils and Lifeline Utilities	Large reduction in current and future EPBs as the majority appear to be low rise, and/or non-profile category buildings.

156. Option 3 provides the most favourable benefit cost ratios across all policy options across the six centres examined in Beca's analysis. This analysis suggests that Option 3 could save EPB owners in these centres $5.3 billion in reduced seismic remediation costs , relative to costs incurred under the current system. The savings would be higher when applied across all of New Zealand.

OPTION 3 LENDS ITSELF TO SCALING REMEDIATION OBLIGATIONS TO ACCOUNT FOR RISK APPETITE

157. To illustrate that, this report describes two variations: Option 3a and 3b. They use Option 3's risk-targeting framework, but achieve further cost reductions by focusing remediation obligations on priority buildings (which present an elevated risk to the public) and Importance Level 4 buildings (which are essential to disaster response) respectively.

158. Options 3a and 3b are not analysed in detail in this report and no cost/benefit analysis is available. Nonetheless some general observations can be made, as set out below.

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OPTION 3a: FOCUS ON PUBLIC SAFETY ONLY

159. Similar to Option 3, 3a uses mitigation matrices based on the level of human exposure, building vulnerability and the seismic zone to provide a menu of obligations that range from risk notification through to mandatory retrofit. But 3a achieves further cost reductions by focusing remediation obligations on 'priority buildings', which present an elevated risk to the public.

160. Option 3 aims to protect life safety for building users/residents and the public. Option 3a, however, focuses solely on protecting the public, on the assumption that building users and occupiers can make their own decisions about their risk exposure.[19]

161. It does this by focusing regulatory obligations on priority buildings. Priority buildings are designated as such because they are considered to pose a high risk to life safety for the general public or are critical to communities' safety in an emergency. The Building Act requires that priority buildings be remediated faster than other buildings, because of the risks their failure would pose.

162. Priority buildings, as defined in s133AE of the Building Act 2004, include buildings in medium and high seismic zones which belong to one of three categories:

- buildings used in emergency response (eg hospitals, emergency shelters, emergency response services, and educational buildings with occupancy of 20 people or more) [20]
- buildings which, if they collapsed, may impede critical routes for emergency services
- URM buildings along streets with high pedestrian or vehicular traffic.

[Note, however, that in para 165 below we propose two modifications to this definition of 'priority buildings' for application in Option 3a.]

163. Of the approximately 5,500 current EPBs, around 1,800 (~33%) are priority buildings, and another ~100 (roughly 2%) have 'priority parts' (see Figure 15, below).[21] For reference, there are currently the following number of priority buildings in: Christchurch (124), Wellington (183), Feilding (30) and Whanganui (19). There are no priority buildings in Auckland because Auckland is in a low seismic zone.

164. In Wellington, nine buildings are designated as priority buildings due to their function, 97 due to being on an emergency transport route, and 109 due to being on a high traffic route. The total number of priority buildings in Wellington (183) is less than the sum of this due to some buildings meeting more than one of these requirements.

[19] The Steering Group were of the view that it is inherently difficult to disentangle private and public safety, because the lines between them are blurred. For example, retail customers and visitors to a residential apartment may not be aware that the building is an EPB, and employees who work in an EPB may not have a choice about where their work takes place.

[20] The first category in para 1622 is similar, but not identical, to Importance Level (IL) 4 buildings. IL4 buildings include buildings used for special post-disaster functions including medical emergency and surgical facilities, emergency services and designated emergency shelters. IL4 buildings also include "Buildings and facilities containing hazardous materials capable of causing hazardous conditions that extend beyond the property boundaries", which are not specifically identified in the definition of priority buildings. Schools, which are included in priority buildings, are not IL4 buildings.

[21] 'Priority parts' are parts of URM buildings which may fall from the building in an earthquake onto a public road or walkway with high vehicle or pedestrian traffic as designated by the TA.

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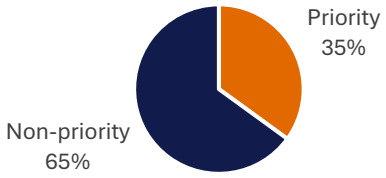
Figure 15: % of priority buildings in medium-high seismic zones currently on the EPB Register



165. Option 3a would, in our view, work better with two modifications to the definition of priority buildings in the Building Act. These are:

- Designating priority buildings across all seismic zones – currently, the Building Act only allows for priority buildings to be designated in medium and high seismic zones. There are currently no priority buildings in low seismic zones (eg Auckland and Dunedin).

  Continuing this approach under Option 3a would mean that no building in a low seismic zone would require any form of remediation work. This could pose high risks to public safety as earthquakes can still happen in these areas. We therefore recommend that, for Option 3a, priority buildings be designated in all seismic zones.

- Designating concrete, as well as URM, buildings along 'high traffic' routes as priority buildings – Section 133AF of the Building Act enables TAs to designate so-called 'high traffic' routes. These are streets with enough foot or vehicular traffic to justify designating URM buildings along those routes as priority buildings. Most TAs in medium and high zones have already identified these high traffic routes.

  Both URM and concrete buildings, however, can cause injury and death to people adjacent to the building when they collapse. The CTV and Pyne Gould buildings' collapse in the 2011 Christchurch Earthquake demonstrated this risk (see Figure 16, below). Hence, we recommend extending the scope of s133AF to include non-URM buildings (such as some apartment buildings and commercial buildings).

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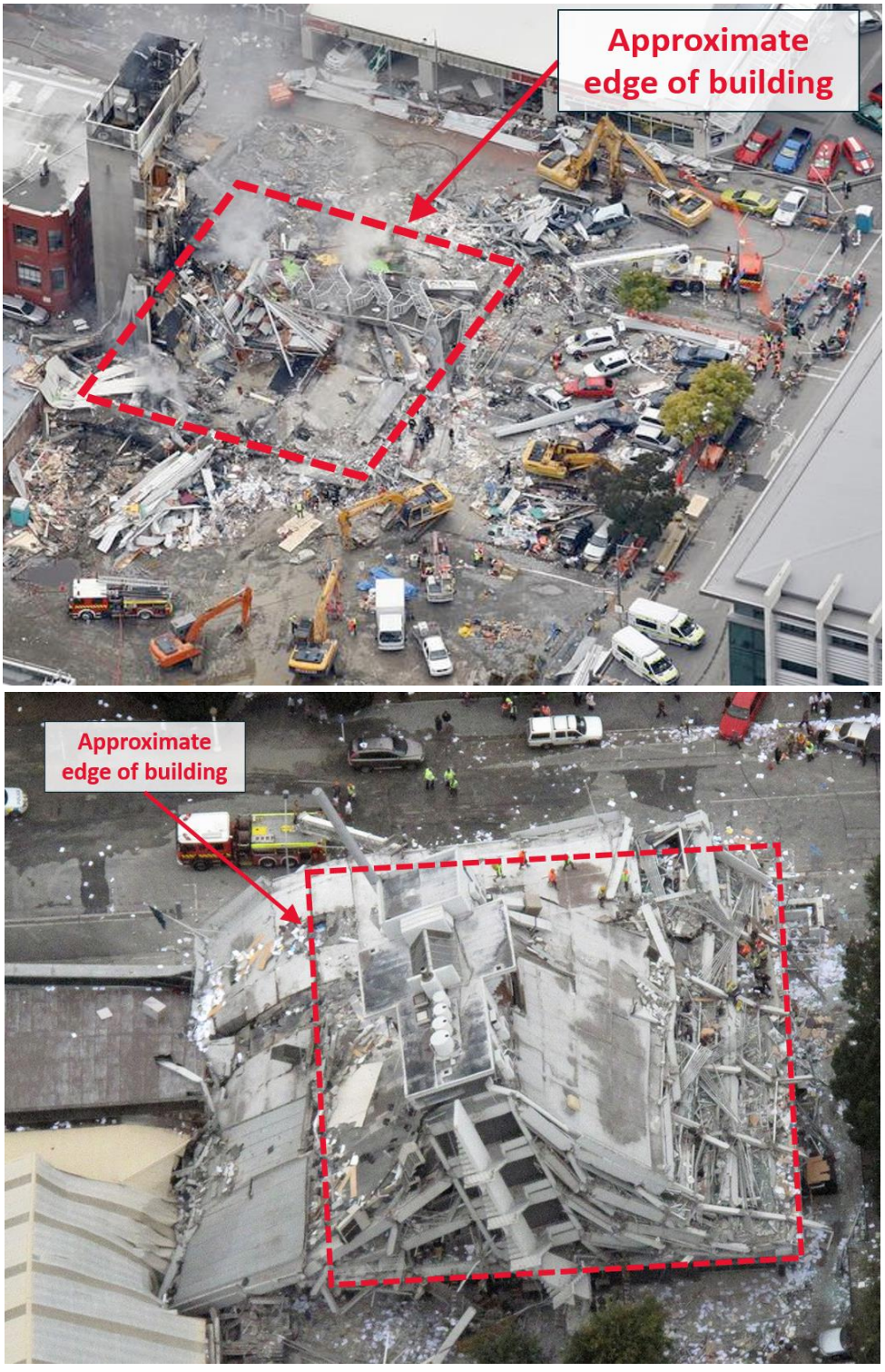
Figure 16: Aerial views of CTV and PGC buildings after collapse in 2011 Christchurch Earthquake indicating collapse debris extending beyond the building footprint.



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166. Option 3a arrives at a building's required level of remediation via two factors:

- Whether it is a priority building, according to the revised definition above (para 162). If it is not, regardless of any other factor, the only mandatory requirement is risk notification.
- If it is a priority building, then the mitigation matrices in Table 10 below provide the required level of remediation.

Table 10: Mitigation matrices for Option 3a

Low Zone matrix:

Increasing Building Vulnerability →

Increasing Consequence ↓

	Class 1 – Lower vulnerability buildings	Class 2A – Vulnerable Multi-storey buildings	Class 2B – Vulnerable URM buildings
Category 1 *Low exposure*	A – No mandatory requirements	B – Risk notification	B – Risk notification
Category 2 *Regular exposure*	A – No mandatory requirements	B – Risk notification	C –Targeted Retrofits
Category 3 *High exposure*	A – No mandatory requirements	B – Risk notification	C –Targeted Retrofits

Medium and High Zone matrix:

Increasing Consequence ↓

	Class 1 – Lower vulnerability buildings	Class 2A – Vulnerable Multi-storey buildings	Class 2B – Vulnerable URM buildings
Category 1 *Low exposure*	A – No mandatory requirements	B – Risk notification	B – Risk notification
Category 2 *Regular exposure*	A – No mandatory requirements	C –Targeted Retrofits	C –Targeted Retrofits
Category 3 *High exposure*	A – No mandatory requirements	C –Targeted Retrofits	D – Retrofit to EPB Threshold

167. Relative to Table 7 (for Option 3), Table 10 (for Option 3a) reduces the mitigation requirements in low seismic zones. URM buildings on high traffic and emergency routes in a low seismic zone, such as Auckland, would require façade securing because of the risks to the public. There would be no remediation requirement beyond risk notification for non-URM buildings in a low zone. Figure 17 compares the remediation requirements for Options 3 and 3a, indicating a significant increase in the number of buildings only requiring risk notification.

168. Table 10 also seeks further simplicity by merging the matrices for the medium and high seismic zones. Alternatively, Option 3a could use separate matrices for medium and high seismic zones (as per Table 7).

169. In medium and high seismic zones, the mitigation matrices require targeted retrofits for large pre-1976 concrete buildings, including multi-unit multi story apartments along high traffic and emergency routes. This recognises the high risk to the public posed by severely damaged and collapsed concrete buildings (refer Figure 15).

170. Option 3a would see a further key decision delegated to TAs – namely, redesignating high traffic routes using new, more prescriptive, guidance. There has been some inconsistency in approach to this under the current system. Some TAs have designated very few routes as high traffic, while others have included most inner-city streets. For example, more than half of Wellington's priority buildings are on a high traffic route.

171. Under the current regime, the decision to designate a building as a priority building only impacts the timeframe under which remediation is required. But under Option 3a, this decision would determine whether any remediation work is required. This is a higher-level consequence, and as such, more national consistency is desirable.

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172. MBIE considers that routes designated 'high traffic' under s133AF should be characterised by continuous storefronts or other indicators of genuinely high and sustained foot traffic. In our view a street should not be designated high traffic simply because it is in the inner city. We therefore suggest that if Option 3a is adopted, MBIE issue new guidance for applying 133AF and TAs be required to reconsider their existing designations in light of this. In some regions, including Wellington, this would likely result in a significant reduction in the number of 'high traffic' routes, and hence the number of buildings that are within scope of s133AF.

173. Under Option 3a, EPB owners could experience a further cost saving compared to current requirements. Specifically:

- all remediation costs would be removed for around 88% of EPBs, of which:
  - around 45% (all non-Profile Category Buildings) would be removed from the EPB Register
  - around 43% (EPBs with low exposure, including in small regional centres) would only be required to display an EPB notification to inform building occupants and visitors
- around 10% of priority URM EPBs would have 80% cost savings as they would only require façade securing
- around 1% of priority concrete buildings (including some residential apartments) and priority URM buildings of 3 stories or more would have around 20% cost savings through the use of targeted retrofits.

174. There would be no cost savings for the remaining <1% as these buildings (priority URM buildings with high exposure in medium and high zones) would still require strengthening to the minimum EPB threshold.

Figure 17: Estimated reduction in retrofit costs between Option 3, Option 3a and Option 3b

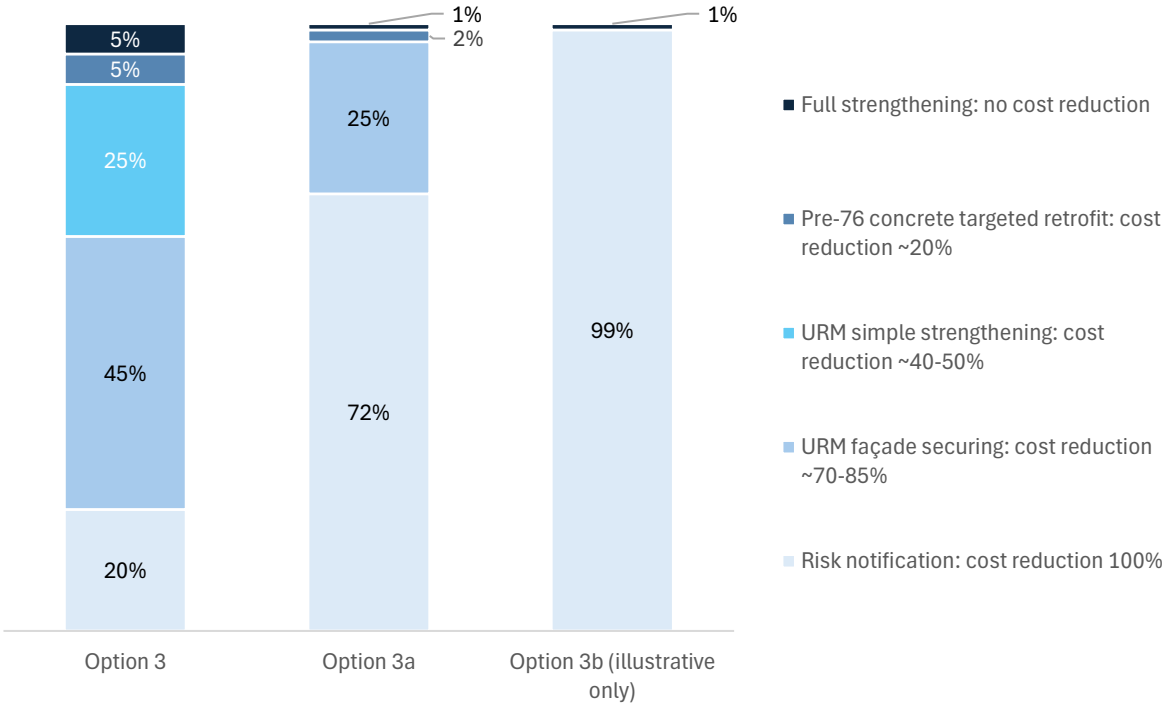

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Table 11: Option 3a's indicative impacts on the current stock of EPBs

Building typology	Requirement	Estimated cost reduction	Proportion EPBs (approx.)
Profile Category A: Unreinforced masonry buildings			**51% (2,800)**
Priority buildings: All zones: regular exposure Low seismic zone: high exposure	Façade securing	~80%	10% (550)
Priority buildings Medium-High seismic zone: high exposure	Retrofit to EPB threshold	N/A	<1% (<50)
Priority buildings All zones: low exposure Non-priority buildings	Risk notification	100%	40% (2,200)
Profile category B: Pre-1976 concrete buildings, 3+ storeys			**4% (200)**
Low seismic zone All buildings Medium-High seismic zone Non-priority buildings	Risk notification	100%	3% (100)
Medium-High seismic zone Priority buildings	Targeted retrofit	~20%	1% (50)
Non-profile category: Other buildings			**45% (2,500)**
All zones	Removed from register – ~5% subject to review (see para 189)	100%	40-45% (2,200-2,500)

175. Option 3a is a new option that was not included in Beca's preliminary economic analysis of the policy options, but we expect that savings for EPB owners would be significantly higher under Option 3a than Option 3. The residual life safety risk, however, would also rise accordingly.

OPTION 3b: FOCUS ON BUILDINGS THAT ARE ESSENTIAL TO DISASTER RESPONSE BY TARGETING IMPORTANCE LEVEL 4 BUILDINGS

176. The Building Code and supporting documents set out five importance levels for new buildings. The required seismic resilience of a new building is determined by what Importance Level (IL) that building is. The five importance levels are set out in Table 12 below:

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Table 12: Building importance levels, consequences and examples

Consequences of failure	Description	Importance level	Examples (not exhaustive)
Low	**Low** consequence for loss of human life, *or* **small or moderate** economic, social or environmental consequences.	1	Minor structures (failure not likely to endanger human life).
Ordinary	**Medium** consequence for loss of human life, *or* **considerable** economic, social or environmental consequences.	2	Normal structures and structures not falling into other levels. Most residential and commercial buildings.
High	**High** consequence for loss of human life, *or* **very great** economic, social or environmental consequences.	3	Major structures (affecting crowds). Theatres, assembly buildings, large commercial buildings, schools.
		4	Post-disaster structures. Hospitals, fire stations, police stations, emergency response or communication centres and shelters.
Exceptional	Circumstances where reliability must be set on a case by case basis	5	Exceptional structures (eg dams)

177. IL4 buildings are buildings that are essential to post disaster response, eg hospitals, medical facilities, emergency shelters, fire / police stations, building with critical national defence functions and air traffic control towers.

178. There is no central record of IL4 buildings, so we are uncertain how many there are. We are confident, however, that residential buildings and commercial premises (eg offices, retail) are unlikely to be designated as IL4. Rather, we expect that the great majority IL4 buildings would be owned or leased by government agencies.

179. Option 3b would work in a similar way to Option 3a, but instead of applying scaled remediation obligations to priority buildings as per Table 12 above, it does so to IL4 buildings only. Any building that is not IL4 would only be required to provide risk notification. This includes priority buildings that are not IL4.

180. Option 3b applies remediation obligations to a much smaller subset of buildings than Option 3a. As described in para 162, priority buildings are designated as such because:

- they have an emergency response function, or
- are on an emergency access route, or
- are on a high traffic route.

181. In contrast, buildings are *only* designated IL4 because they have an emergency response function. Data from Wellington (refer para 164 above) suggests that the great majority of priority buildings are on emergency access or high traffic routes, and do not have an emergency function. They would not have any remediation obligations under Option 3b.

182. Option 3b could be considered the minimum viable regulatory approach. It applies remediation obligations to a minimal number of buildings, which are mostly owned or used by the government. Those obligations are further targeted to the risk posed by that building's

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location, type and exposure (meaning that, for example, the only full retrofit requirement would be for URM buildings in medium or high seismic zones).

183. Most IL4 building owners will in fact target a remediation level well above the regulatory minimum of 34% to provide further confidence they will be able to provide their critical services after a strong earthquake.

184. Because there is no available count of IL4 buildings, we are unable to set out the impact of Option 3b in terms of cost savings, and impact on building owners with precision. Figure 17 above provides an estimate. In terms of its benefit/cost ratio, we expect that Option 3b would perform similarly to Option 4 as without mandatory remediation requirements, life safety risk would likely remain unmitigated in most non-IL4 buildings.

4.6. Option 4: remove the EPB regime entirely

185. This option involves law change to remove EPB system altogether. In its place, reliance would be placed on market forces such as insurance requirements and tenant expectations to drive seismic risk mitigation. MBIE and TAs would have no statutory power to intervene but could retain a supporting and monitoring role, potentially with non-regulatory tools such as case management.

186. The Government could encourage its agencies to remediate their building stock as required. Without a statutory requirement to do so, however, remediation would be discretionary, requiring agencies to balance the cost against their competing priorities.

4.7. Options 2 and 3 require a clear framework or process by which non-Profile Category buildings should have EPB status changed

ALMOST ALL NON-PROFILE CATEGORY EPBs COULD BE REMOVED FROM THE REGISTER AS PART OF THE LEGISLATIVE CHANGE

187. Options 2 and 3 focus on buildings current captured under Profile Categories A and B, namely unreinforced masonry and pre-1976 buildings three storeys or more (which are mostly concrete). These building types have been shown consistently in earthquakes in New Zealand and abroad to be highly vulnerable to severe damage and collapse.[22]

188. Most buildings outside Profile Categories A and B tend to be more resilient to severe damage which would put lives at risk. These include low rise concrete and timber-frame buildings (refer Figure 9 above). But the 2011 Christchurch earthquake highlighted that some larger concrete buildings constructed after 1976 can pose significant life safety risks to occupants and those nearby – most notably the CTV building, whose collapse caused 115 fatalities. Several other post-1976 buildings were critically damaged and presented significant risk to the public.

189. Option 2 and 3 therefore require consideration of which non-Profile Category buildings that were previously designated EPBs should retain that designation. Our initial modelling envisages that almost all of them could have that designation removed, as most present a lower life safety risk than Profile Category buildings. There will be at least a few, however, that pose a high life safety risk that is comparable with Profile Category buildings.

190. For Option 3, we would aim to have the vast majority of these redesignations proposed as part of the legislation or new regulations, and made as part of the legislative change process. This

[22] We propose not to maintain Profile Category C (pre-1935 non-URM that are one to two storeys) as these are considered less vulnerable than Categories A and B.

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would mean that owners of non-Profile Category EPBs are provided with certainty on whether their building will remain on the EPB register or not.

191. The small fraction of non-Profile Category buildings that remain designated as EPBs (roughly 150) would remain on the EPB register, or could be recorded separately on a schedule. Either way, they would be subject to the remediation requirements set out in Table 7 above (which vary by seismic zone and risk profile).

192. The process and methodology for undertaking this 'triage' of non-Profile Category EPBs (which would be based on building typology, not individual assessments) is yet to be determined.

IT MAY ALSO BE DESIRABLE TO HAVE A PROCESS TO ADD NEW EPBs IN FUTURE

193. Option 2 envisages, and Option 3 leaves room for, a process by which new buildings are added to the EPB register. That may be desirable in cases where a voluntary building assessment highlights serious seismic vulnerabilities, that pose a life safety risk similar or higher than a typical Profile Category building. This is the intent of the current 'at any time' pathway – which at present is being overused.

194. Whether this pathway should be retained in any form is still to be determined. If it is retained, it would need a narrowed and strictly applied scope. A centralised function (eg MBIE or an expert panel) may help to achieve this. Alternatively, these decisions could be delegated to TAs, as currently.

195. We have not yet explored this matter in detail. We intend to do this as part of the detailed legislative design set out in the 'next steps' section of this paper.

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5. Preliminary analysis and risk assessment

196. The following section provides indicative cost benefit analysis, assesses the policy options against the assessment criteria, and sets out our rationale for the recommended approach.

5.1. Cost benefit analysis

197. The preliminary cost benefit results in this report were commissioned from Beca. The indicative analysis in Table 13 below:

- compares the relative change in total benefit to cost from the benchmark of strengthening all buildings on the current register to 34%NBS versus adopting one of the policy options. This data aggregates results from six locations, which involves high levels of uncertainty and does not represent an actual earthquake scenario
- applies only across the six centres investigated in the Beca economic analysis (Auckland, Wellington, Christchurch, Dunedin, Feilding and Whanganui). National cost savings will be higher than the values quoted here for these six centres
- assumes all buildings subject to mandatory mitigation requirements for the different options are indeed mitigated (ie 100% compliance)
- should be treated as preliminary in nature and will be refined for regulatory impact analysis after detailed policy development.

198. Through the implementation of simple strengthening solutions for one and two storey URM, Option 1 would provide around $0.5 billion in relief from mandated strengthening costs for EPB owners in the six centres. The benefit-cost ratio for this option is around 2-4% less favourable than the status quo, depending on the level of ground shaking.

199. Option 2 would save around $2.7 billion (for the six centres) and provides a benefit-cost ratio that is 7-11% less favourable than the status quo. This option provides a significant saving for EPB owners compared to Option 1, but remediation costs are significantly higher than for Option 3. The marginal benefits (ie reduction in losses) of this option compared to Option 3 do not make up for this increase in remediation cost.

200. Option 3 provides the highest benefit cost ratios across all options for the levels of ground shaking analysed. This option could save $5.3 billion (for the six centres) and provides a benefit-cost ratio that is 22-43% more favourable than the status quo.

201. Option 4 would save around $7.9 billion (for the six centres), as all EPB owners are relieved of any mandatory remediation obligations. But without mandated remediation there would be no benefits, including for the worst of the worst buildings.

Table 13: Indicative cost benefit analysis

	Est. strengthening costs saved compared to status quo	Est. change in BCR compared to status quo
Option 1	$0.5bn (7%)	2-4% less favourable
Option 2	$2.7bn (35%)	7-11% less favourable
Option 3	$5.3bn (67%)	22-43% more favourable
Option 4	$7.9bn (100%)	N/A

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5.2. Performance against assessment criteria

202. A summary of how the options perform against our assessment criteria is set out below.

Table 14: How the options compare to the status quo

	Status quo	Option 1: Improve the current system	Option 2: Reduce the current system's scope but retain its essential features	Option 3: Focus regulatory obligations on high-risk concrete and unreinforced masonry buildings	Option 4: remove the EPB regime entirely
Effective at reducing life safety risk in existing buildings	0	0 Similar level of risk reduction compared to status quo	+1 Fewer buildings have risk reduced but slightly better compliance	+2 Fewer buildings captured overall but higher levels of compliance expected	-2 No mandated reduction of risk
Proportionate: Intervention is proportionate to the risk posed	0	0 Regulatory requirements slightly more targeted to risk	+1 Regulatory requirements more targeted to risk	+2 Regulatory requirements much more targeted to risk	-2 No consideration of building risk
Efficient: Building owners' costs relate solely to reducing seismic risk	0	+1 Costs are somewhat more targeted to seismic risk	+1 Costs are targeted to seismic risk but could go further to proportionately address risk posed	+2 Costs are targeted to seismic zones and the consequences of building failure	N/A There is no EPB system imposing costs on owners. Owners may incur costs if they are driven by market factors to obtain seismic assessments or undertake remediation work
Certain: Building owners' obligations are clear so they have confidence to carry out remediation work	0	0 Similar certainty to status quo	0 Non-Profile Category Buildings removed	+1 Low exposure buildings require notification only. Clear focus on specific building types	N/A No requirements
Administrative simplicity: The system is simple to administer, and the costs of doing so are reasonable	0	0 Similar simplicity to status quo	-1 Adds varied strengthening requirements	-2 Adds more varied strengthening requirements based on risk	+1 No requirements but some government monitoring/ support
TOTAL	0	1	2	5	-3

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OPTION 1: IMPROVE THE CURRENT SYSTEM

203. Option 1 refines the current system, adjusting rules and practices without changing the Building Act.

204. Across options that retain regulation, Option 1 is the simplest to administer, due to it making only minor tweaks to the existing system and retaining its key features. This also means it provides a high level of certainty to building owners about their continued obligations to remediate. But while it is administratively simple, Option 1 does not resolve key issues with the current EPB system and therefore results in a more limited improvement to its effectiveness than Options 2 and 3.

205. In particular, Option 1 imposes remediation obligations and costs on building owners that are not always proportionate to the actual risk posed by the particular building (or part thereof). It also fails to adequately address the inclusion of low-risk buildings on the EPB Register. These factors lead to greater costs for EPB owners compared to the other options, and do not support widespread compliance with remediation obligations by EPB owners.

OPTION 2: REDUCE THE CURRENT SYSTEM'S SCOPE BUT RETAIN ITS ESSENTIAL FEATURES

206. Option 2 creates changes to regulatory settings and assessment practice, to reduce the extent of mandatory requirements for assessment and strengthening. It creates a mechanism to remove remediation obligations for EPBs that are outside the Profile Categories, except for limited high-risk cases.

207. The option has the second-highest total score across the assessment criteria, and scores second-highest in effectiveness next to Option 3. Compared with Option 1, Option 2 provides more flexibility and better addresses cost concerns for many EPB owners. This is by allowing façade securing for one to two storey URMs in low seismic zones, and simple strengthening for one to two storey URMs in medium and high seismic zones. These retrofits help to address the most vulnerable structural elements of these buildings and would improve the effectiveness of the system by increasing compliance with remediation requirements.

208. While Option 2 is more effective than the status quo since it provides cost savings for many EPB owners (particularly of non-Profile Category buildings), it still imposes remediation obligations on buildings where the life safety risk may not justify that. It therefore scores lower than Option 3, which is more effective, proportionate and efficient.

OPTION 3: FOCUS REGULATORY OBLIGATIONS ON HIGH-RISK CONCRETE AND UNREINFORCED MASONRY BUILDINGS

209. Option 3 balances risk and cost management by directing limited engineering and construction resources to buildings that pose the greatest life safety risk. It simplifies the identification process, and in doing so eliminates reliance on %NBS ratings and the issues this gives rise to.

210. Of Options 1-3, Option 3 involves the greatest level of change. It narrows the scope of regulation to buildings that pose the greatest life safety risk, and enables more cost-effective retrofits for EPBs by targeting the most vulnerable structural components. This approach directly addresses cost – the principal barrier to remediation – more effectively than Options 1 and 2, and should improve effectiveness in comparison to the status quo by increasing building owners' compliance with mitigation requirements.

211. Option 3 also reflects international best practice, such as:

- not using a full seismic assessment to identify buildings that require mitigation
- allowing incremental retrofitting for certain building types

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- enabling more cost-effective retrofits (ie 80/20 approaches to managing risk)
- relying on disclosure, rather than requiring remediation, for lower-risk buildings.

212. Option 3 has the highest aggregate score across the assessment criteria, and scores highest in the effective, proportionate and efficient criteria. It scores worst against the administrative simplicity criterion, because there is initial complexity when introducing the new system, due to the varied mitigation requirements based on risk. We expect that once implemented, however, the administrative burden will fall as EPBs are exited from the system. It should also provide stakeholders with a high degree of certainty as to their obligations.

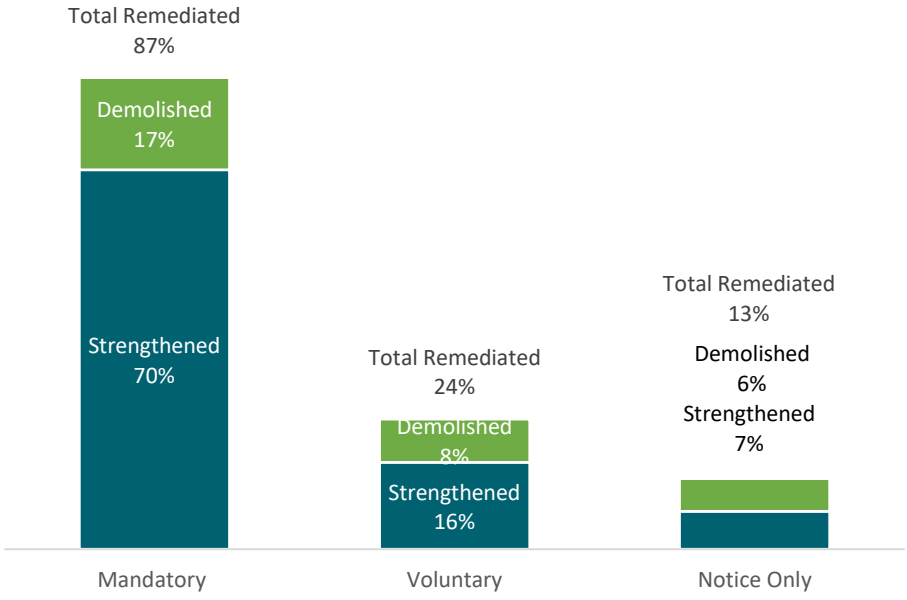
213. We have not analysed options 3a and 3b in this report. We would expect, however, that in terms of performance against the assessment criteria Option 3a would perform largely similarly to Option 3, whereas Option 3b would perform more closely to Option 4. While no benefit/cost ratios are available for these sub options, it is likely that Option 3b would have a similar ratio to Option 4.

OPTION 4: REMOVE THE EPB REGIME ENTIRELY

214. By removing mandatory remediation obligations, Option 4 relies instead on market forces such as insurance, lenders and the real estate market to drive remediation. It offers the greatest cost savings and administrative simplicity. But this comes at the expense of increasing life safety risk, particularly for the worst performing buildings.

215. International evidence suggests that voluntary or market-led approaches to managing seismic risk are largely ineffective. For instance, in California, jurisdictions that adopted voluntary URM remediation schemes reported retrofit rates of only 13 – 25%. In contrast, jurisdictions with mandatory URM remediation requirements achieved compliance rates of approximately 87% over a 20-year period (see Figure 19 below).[23]

Figure 19: Compliance levels of URM buildings under mandatory and voluntary regimes in California



[23] California's local bodies were required to identify URM buildings and establish seismic risk mitigation programmes. Each could design their own scheme - 134 opted for mandatory, and 39 for voluntary.

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216. Removing the EPB system could generate market instability and uncertainty for property owners. Possible impacts include:

- significantly higher fatalities and injuries in the event of an earthquake
- reduced purchaser confidence in former-EPBs due to lack of assurance around structural safety
- depressed asset values resulting from diminished regulatory oversight
- increased insurance premiums to offset increased risk exposure
- increased cost for the Crown and society in the event of an earthquake
- health and safety regulations likely playing a more significant role in remediation decision-making.

217. While removing the EPB system may provide temporary financial relief for property owners, it would significantly increase life safety risks. Furthermore, EPB owners may face uncertain and unquantified remediation costs that may arise from market forces imposed by lenders, insurance and the real estate market. We therefore conclude that the societal and economic risks of this approach likely outweigh its cost savings.

5.3. We think that Option 3 is a good basis for further policy development

218. In our view, the current EPB system is unsustainable, as many (and quite possibly most) building owners cannot or will not comply with it. Option 3 presents a more practical system, which narrows the scope of the existing system to ensure remediation obligations are focused solely on buildings with the highest life safety risk.

219. Option 3 would likely be a more effective, efficient and proportionate system, which will ensure better compliance and deliver more targeted, cost-effective retrofits. By also removing unnecessary obligations for lower-risk buildings, Option 3 addresses the major barrier to remediation for most EPB owners – cost.

220. As noted above, however, Option 3 lends itself to scaling regulatory obligations in accordance with risk tolerance. MBIE views Option 3 as a good starting point for further policy work, but not necessarily as the final end point of this work. Mandatory remediation is proving to be a challenging and sometime insurmountable compliance burden for many EPB owners. If the Government is minded to minimise the imposition of this burden beyond what Option 3 allows for, there may be merit in exploring Option 3a, 3b or a similar variant.

OPTION 3 INCREASES RESIDUAL LIFE SAFETY RISK (ALBEIT, TEMPERED BY INCREASED COMPLIANCE)

221. Option 3 involves a significant reduction to the current scope of earthquake strengthening requirements. This increases life safety risk. For example:

- Around 10% of total EPBs would be ‘notification only’, with no remediation requirement. Experience suggests that EPB notices in windows, in and of themselves, have little or no impact on the use of those buildings. But this is only allowed for buildings with low human exposure, eg buildings in small regional towns.
- Around 25% of total EPBs would qualify for URM façade securing as an acceptable form of remediation. This mitigates risk of falling debris to people outside the building, but does nothing to protect people who are inside it. But this is done in the recognition that most of the risk from a URM building is to people outside the building, because brick walls tend to fall outward.

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- Around 45% of current EPBs would be taken off the register without any need for further assessment or remediation. These are 'non-profile category' buildings with <34%NBS. There would no longer be any requirement to post an EPB notice or remediate these buildings. However, most non-profile category buildings represent a significantly lower risk to life compared to the profile category buildings.

222. Beca's preliminary cost-benefit analysis concluded that Option 3 may lead to an increase in life safety risk of approximately 50% compared to the status quo. This study assumes 100% compliance for all options, however. As indicated earlier in this report, the status quo is not likely to lead to high compliance rates. We anticipate that reducing the number of EPBs and enabling more cost-effective retrofit solutions will lead to higher compliance rates, and that this improvement will largely offset the increase in life safety risk. We have scored Option 3 relatively highly for effectiveness in recognition of the expectation for higher compliance.

223. We will test the assumptions underlying Beca's preliminary work as part of the detailed cost-benefit analysis required for the Regulatory Impact Statement. The estimated losses are highly sensitive to assumptions around building occupancies at the time of the earthquake and the rate of fatalities associated with different levels of building damage.

Options 3a and 3b would progressively result in higher residual risk

224. We do not analyse Options 3a or 3b in-depth in this report. Nonetheless, it is worth noting that enabling all non-priority or non-IL4 EPBs to post a risk notification only would inevitably increase the residual life safety risk over and above that posed by Option 3.

- For Option 3a, the increase to life safety risk relative to Option 3 would be greatest for occupants or users of EPBs which are not located on priority routes. This will include at least some large apartment buildings which are at risk of severe damage or collapse in a strong earthquake. The exact number could not be determined until new priority routes are identified – noting our recommendation that the number of these be significantly reduced in line with a more prescriptive methodology for identifying them.
- For Option 3b, the increase to life safety risk relative to Option 3 would be greatest for occupants or users of EPBs which are not IL4. This is the great majority.

225. Options 3a and 3b rely on risk notification for many more EPBs than options 1, 2 or 3. While these buildings would not require remediation work, risk notification (ie being a designated EPB on the register) in and of itself can be a prompt to voluntary remediation. But it can also contribute to challenges accessing insurance or financing. The impacts of EPB status interplay in complex ways depending on the building's type, ownership, location and usage.

… MAY NOT FULLY ALIGN WITH THE ROYAL COMMISSION'S RECOMMENDATIONS

226. The current EPB system does not incorporate all aspects of the Royal Commission's recommendations (eg enabling TAs to require higher seismic ratings than the national minimum). This would remain the case under Option 3, as a centrally regulated approach ensures greater certainty and consistency for building owners and users across New Zealand.

227. To mitigate risk of misalignment between Option 3 and the Royal Commission's findings, we would look to progress legislative change alongside continued support for the Seismic Assessment Guidelines, future retrofit guidelines for types of regulated buildings, and development of a new rating system to replace %NBS.

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… AND POSES SEVERAL OTHER RISKS AND UNCERTAINTIES

228. Other risks and uncertainties posed by Option 3, and suggested mitigations, are set out in Table 15 below. These risks also apply to Options 3a and 3b, but to a greater extent.

Table 15: Option 3 risks and mitigations

Risk / Drawback	Mitigation
Achieving wider acceptance of the increase in residual risk due to the exclusion of some vulnerable buildings.	Securing public support for the changes from engineers, TAs and building owners. Buy in from those affected by the Canterbury earthquakes would also be valuable. Clear communication that: • the level of compliance with mitigation requirements is expected to be higher under the new system – meaning that the residual life safety risk in buildings is expected to be lower than under the current system • the buildings being removed are lower risk and that some are not buildings which the system originally imagined being captured. • the preliminary Beca study requires further testing to understand the life safety risks presented under Option 3 relative to the current EPB system, when scaled beyond the six locations to a national-level. Further testing and a more detailed cost-benefit analysis will be carried out for the regulatory analysis assessment.
Perceptions that engineering advice on vulnerabilities in specific buildings (as set out in their seismic assessments) is being overridden.	Make the case that mandatory remediation will still be scaled to take into account vulnerability and consequence, and that building owners are free to remediate beyond the statutory minimum.
Requires high resourcing (central and local plus technical expertise) to transition to and manage the new system.	MBIE will need to prioritise its resource to support any legislative change. Trade-offs against other priorities will be necessary.
Fear of another CTV disaster, as this kind of building would not be automatically captured by the new system.	Some level of review will be required before multi-story concrete EPBs have that status removed. This will require active decision making, particularly for higher risk buildings.

NOR WILL IT COMPLETELY RESOLVE ISSUES RELATING TO INNER CITY APARTMENTS

229. Option 3a would go further than Option 3 to remove inner city apartments from the reach of the EPB mitigation requirements. Only apartment buildings along high traffic routes would require remediation under Option 3a. In Wellington, for example, we conservatively estimate that Option 3a could remove in the order of 15 further residential EPBs relative to Option 3. This would leave around 50 EPB apartments (of three storeys or more) in the city.

230. Wellington designated almost every street in CBD as a “high traffic route”, however, and redefining this to focus on heavy trafficked commercial streets could reduce the number of residential EPBs still further.

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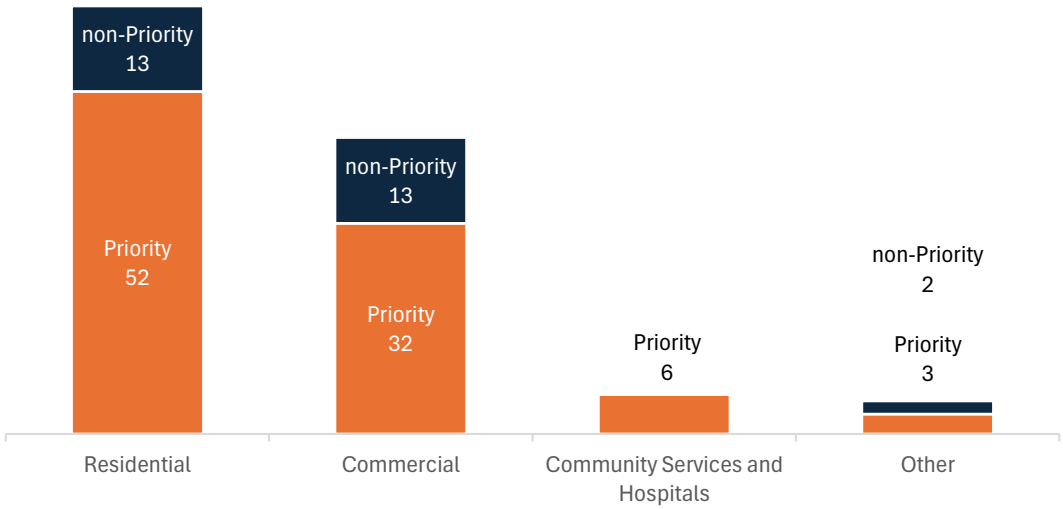
Figure 20: Number of Wellington priority and non-priority buildings (3 storeys and over)



231. Both Options 3 and 3a will work best alongside other forms of assistance because we know that some building owners, irrespective of the changes proposed, still will not be able to afford to remediate. The Next Steps section of this report sets out the work we would like to do to help residential EPB owners remediate to the required standard. Reducing the number of such apartments to the bare minimum may make it easier to provide that support, especially if it has a financial element.

232. The only options considered in this report that completely remove all remediation obligations from these buildings are Option 3b and Option 4.

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6. Preparing legislation, and broader changes to improve the wider EPB system

233. The policy options described in this document are high-level only. Further work remains to prepare for legislative change. This section first outlines the key steps for legislative development and operational preparation that MBIE must carry out, and then sets out further policy work that is required across government. The final part of this section sets out the work that is required to support owners of EPB apartments to remediate.

6.1. Preparing for legislative and operational changes

234. A comprehensive package of legislative and regulatory changes will be required to implement an updated EPB system. Option 3, for example, requires:

- amendments to the Building Act 2004 to reflect the new risk-based system and the revised thresholds for remediation obligations
- revision of the EPB methodology to ensure alignment with the new policy approach by updating technical criteria, exposure categories and assessment thresholds
- updating the Engineering Assessment Guidelines and development of Retrofit Guidelines to match the revised methodology, incorporate clear procedures for re-categorising buildings under the updated EPB Register, and define procedures for targeted retrofits and retrofitting the EPB threshold.

235. TAs, building owners and engineers will need to be well informed about the new system and ready to play their part in it. This will involve:

- establishing transition phases so the move to a new system is as seamless as possible
- updating and expanding the EPB Register to:
  - incorporate new building categories (as these will be the basis of many buildings coming off or remaining on the Register)
  - enable tracking of re-assessed buildings
  - record decisions regarding removal of remediation obligations.

Action – Preparing for legislative and operational changes
Lead: Ministry of Business, Innovation and Employment
Look to collaborate with: Building Research Association of New Zealand (BRANZ), territorial authorities, building owners, the New Zealand Society of Earthquake Engineering, other interested parties

6.2. Required policy work

FURTHER INVESTIGATING LIFE SAFETY RISKS OF THE PREFERRED OPTION

236. The preliminary Beca study requires further testing to understand the life safety risks of the preferred option relative to the current EPB system, when scaled beyond the six locations to a national level. Further testing and a more detailed cost-benefit analysis will be carried out for the regulatory analysis assessment.

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MANAGING CHANGES TO %NBS

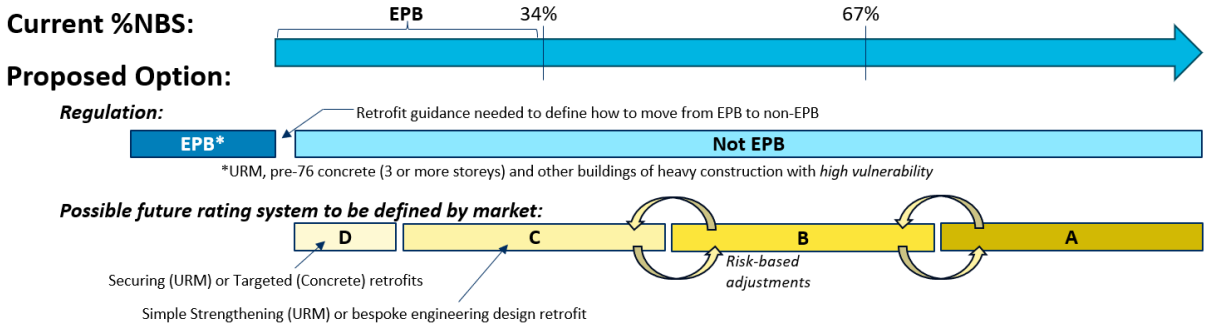
237. %NBS is not used under our recommended option. For regulatory purposes, buildings will be categorised as either 'earthquake-prone' or 'not earthquake-prone'. The latter will not be subject to mandatory mitigation requirements. Outside of the regulatory system, however, the market will still require a suitable measure of seismic risk in buildings.

238. We would like to work with engineers and other stakeholders to come up with a suitable measure, that will support proportionate response to seismic risk by the market, and a gradual increase in the seismic resilience of New Zealand's building stock. One option we are interested in is a category-based system rather than a continuous measure, as set out in Figure 20 below. This approach is supported by the Canterbury Earthquake Royal Commission of Inquiry's recommendation to develop a grading system that can be understood by the general public and adequately describes a building's seismic resilience.

239. A BRANZ-funded research project is currently exploring alternatives to %NBS for improved communication with stakeholders. We propose to work closely with this research programme to ensure it addresses the challenges identified above and will align with proposed changes in the EPB system.

Action – Managing changes to %NBS
Lead: Ministry of Business, Innovation and Employment
Look to collaborate with: Building Research Association of New Zealand (BRANZ), territorial authorities, building owners, the New Zealand Society of Earthquake Engineering, other interested parties

Figure 20: Potential alternative to the % New Building Standard measure



IMPROVED COMPLIANCE TOOLS

240. As noted in this report, the compliance tools available to TAs are not proving workable in practice, and we would like to include improved compliance tools in the law change. We will need to work with TAs to identify options for improving these.

Action – Improved compliance tools
Lead: Ministry of Business, Innovation and Employment
Look to collaborate with: Territorial authorities

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FLEXIBILITY FOR AGENCIES MANAGING CRITICAL INFRASTRUCTURE

241. Agencies who own, manage, or occupy critical public facilities and infrastructure that is needed for post-earthquake response (eg hospitals and emergency centres) often:

- proactively manage seismic risk in their inventory so they can keep operating after a major earthquake
- try to bring their buildings well above the regulatory minimum of 34%NBS, as this minimum won't enable them to keep operating after an earthquake
- plan asset management across their entire inventory, often nation-wide
- aim to balance ongoing service delivery vs remediation.

242. Recognising this, a potential option may be to enable a single remediation deadline (in the order of 20-30 years) for their entire EPB inventory. The minimum remediation requirement would remain at 34%NBS or its equivalent. To qualify for this timeframe, the agency would need to provide MBIE with a long-term remediation plan (covering all of its EPBs) up front, and then periodic progress reports. That plan would need to meet certain principles, including a steady reduction in seismic risk over the duration of the remediation period.

243. This flexibility could be included alongside Options 1-3. This option would require more work and consultation before it could be included in legislation.

Action – Flexibility for agencies managing critical infrastructure
Lead: Ministry of Business, Innovation and Employment
Look to collaborate with: core government agencies

MANDATORY UPGRADES FOR FIRE AND ACCESS

244. The Building Act requires that, in general, EPBs that are open to the public and are undergoing a 'substantial alteration' (including seismic remediation) must also be brought to compliance with the Building Code's fire and disability access provisions. This is to ensure that the opportunity is not lost to bring the building to standard in these areas due to an unnecessarily rigid focus on just doing the seismic remediation. TAs can choose to relax this requirement, however, if it would be unduly onerous (eg if the additional cost would prevent the seismic remediation work being done at all).

245. We are not sure whether these provisions are posing a significant barrier to remediation. Informally, we have heard that some TAs are open to relaxing the 'substantial alteration' provisions, while others are less so. We would like to examine this area further into this matter, including via discussions with the disability sector, to investigate:

- the extent to which the 'substantial alteration' provisions are posing a barrier to seismic remediation, and if so
- whether this is best dealt with via guidance, or whether legislative change is justified.

Action – Mandatory upgrades for fire and access
Lead: Ministry of Business, Innovation and Employment
Look to collaborate with: Territorial authorities, BRANZ

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ADDRESSING ISSUES FOR EPB OWNERS THAT ARISE FROM RULES OUTSIDE THE BUILDING ACT – AND HERITAGE BUILDINGS IN PARTICULAR

246. We will collaborate with other regulatory agencies to help ensure that EPB owners are not subject to conflicting or overly burdensome obligations from non-EPB regulations. This includes, as discussed in the body of this document:

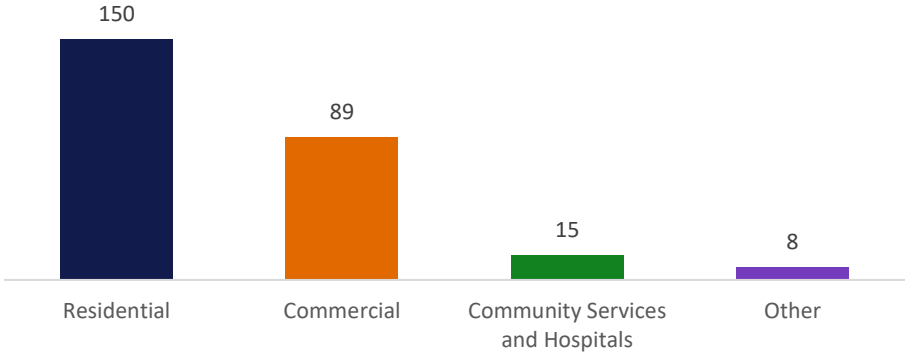
- Ministry for the Environment (Resource Management Act)
- WorkSafe New Zealand (Health and Safety at Work Act)
- Ministry of Housing and Urban Development (Unit Titles Act)
- Ministry for Culture and Heritage.

247. We propose to work with the relevant government agencies, insofar as is possible, on these areas and particularly on ways to address or overcome potential barriers to building owners mitigating seismic risk in their buildings.

6.3. Supporting remediation for apartment owners who reside in EPBs

248. Option 3 would reduce the number of EPBs and provide more cost-effective solutions for one to two storey URM buildings, but will not impact financial barriers for multi-unit apartments of taller than two storeys. There are around 65 of these on the EPB register in Wellington and 56 in Auckland. They range from 3 to 15 storeys, with some containing more than 50 units (see Figure 21 below).

Figure 21: Concrete and URM Buildings three or more storeys on the EPB register across Auckland, Wellington, Christchurch and Dunedin



249. Option 3a would remove the remediation obligation on apartment buildings which are not located on emergency response priority routes or high traffic routes. If this option is pursued, further work will be necessary to estimate the number of buildings this impacts. Furthermore, ongoing studies by Holmes Consulting may lead to some concrete apartment buildings being moved from targeted retrofit to risk notification if they do not contain high risk vulnerabilities, based on a review of the building drawings by an engineer.

250. Despite these potential reductions in mitigation requirements, we still anticipate on the order of 50 residential EPBs three stories or more (exact number to be confirmed) would require retrofit with little or no cost reductions over current requirements.

251. Under current fiscal constraints, direct government funding for remediation of privately owned buildings may not be possible. We therefore propose to work with TAs, building owners and lenders to identify useful means of support that do not require significant Crown investment. The former EPB support service pilot for multi-unit apartment owners may be a model that could be adapted for future use.

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252. Multi-unit building residential owners could benefit from a support service like the pilot to overcome remediation related barriers. In the short period of time the pilot was operational, case management and legal services provided useful support and benefits to EPB owners. If agreed, we will investigate this option. We will also look to explore insurance options with the Natural Hazards Commission.

253. If there is appetite for Crown investment, there are several mechanisms available. These could include tax deductibility for seismic retrofits[24], or grants/subsidised loans.

Action – supporting remediation for apartment owners
Lead: Ministry of Business, Innovation and Employment
Look to collaborate with: Apartment owners, TAs, lenders, developers, Natural Hazards Commission, Inland Revenue, The Treasury

[24] Budget 2025 included a tax rebate for seismic retrofit work on commercial buildings. This could potentially be extended to similar work on residential buildings, perhaps by designating this work as "maintenance" for tax purposes.

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7. Annexes

ANNEX 1: REGULATORY IMPACT ANALYSIS

ANNEX 2: RESILIENT ORGANISATIONS – PUBLIC EXPECTATIONS AND BEHAVIOUR SUMMARY

ANNEX 3: RESILIENT ORGANISATIONS – WILLINGNESS TO PAY SUMMARY

ANNEX 4: SAPERE – IMPLEMENTATION AND OPERATIONALISATION OF THE EPB SYSTEM SUMMARY

ANNEX 5: ECONOMIC ANALYSIS OF NEW ZEALAND'S EARTHQUAKE-PRONE BUILDING SYSTEM

ANNEX 6: SEISMIC RISK MITIGATION PROGRAMMES IN OVERSEAS JURISDICTIONS SUMMARY

ANNEX 7: COST BENEFIT ANALYSIS [INDICATIVE]

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ANNEX 1: REGULATORY IMPACT ANALYSIS

MBIE propose that the criteria are weighted equally. How well an option performs against the current earthquake-prone building system (status quo) is rated using a five-point scale, as set out in Table 1 below.

Table 1: Scale for measuring the impact of proposed changes against the current system or 'status quo'

Key for qualitative judgements	
++	much better than the status quo
+	better than the status quo
0	about the same as the status quo
-	worse than the status quo
- -	much worse than the status quo

	Status Quo	Option 1	Option 2	Option 3	Option 4
Effective – *at reducing life safety risk in existing buildings.*	• Some buildings have been remediated but barriers mean that some owners have not or will not meet their obligations. • Some buildings have also been captured by the system that are not the most vulnerable. 0	• Exclusions and more cost-effective retrofits of simple URMs may increase effectiveness, but key barriers to remediation remain. +	• Changes under Option 1 plus timeframe extensions and permitting some low-cost retrofits may increase compliance/remediation. +	• More cost-effective ways to meet mitigation requirements and spectrum or requirements may increase compliance. • Increase exemptions and disclosure requirements may reduce effectiveness however high-risk buildings are still captured.	• The market is unlikely to effectively drive seismic risk mitigation in all high-risk buildings. - -

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				+	
Proportionate – *intervention is proportionate to the risk posed.*	• Impacts of regulation are not always proportionate to the risk posed, with some buildings outside the profile categories being captured, and no variation in mitigation obligations (except timeframes and some narrow provisions for exemptions or heritage extensions). 0	• Focus is on future EPBs. Exclusions eg for low/infrequent occupancy and enabling more cost-effective retrofits of simple URMs makes regulation slightly more proportionate, but not for existing EPBs. 0	• Impacts of regulation are more proportionate to the risk posed that under the status quo due to timeframe extensions, exemptions for some building types or low occupancy, and permitting some low-cost retrofits. +	• Provides a spectrum of mitigation requirements that are proportionate to risk. ++	• Having no regulation is not proportionate to the seismic risk (particularly life safety risk) post by high-risk buildings. - -
Efficient – *system costs relate directly to reducing seismic risk*	• Significant costs can occur outside of remediation eg during engineering assessment (and reassessment), legal advice and meeting other requirements eg heritage/resource management and health and safety obligations. 0	• May result in some reduction in costs eg by stopping voluntarily assessed buildings that are not highest risk construction types being deemed an EPB in the first place, and by enabling more cost-effective retrofits for simple URMs – but no/minimal change for most current EPBs. 0	• Removal of obligations for some buildings and allowing some cost-effective retrofits means that costs will relate more to reducing seismic risk, with less spent on assessment or unnecessary (or unnecessarily extensive) planning and mitigation. +	• Introducing more cost-effective ways to meet mitigation requirements and using structural characteristics (rather than %NBS) to identify EPBs means that costs are spent more on reducing seismic risk and less on assessments or more costly mitigation. ++	• There is no EPB system imposing costs on owners. • Costs in the market will likely continue to be spent on reducing seismic risk in some buildings (often to above status quo minimum of 34%NBS) and on assessment (and reassessment). N/A
Certain – *building owners' obligations are clear so they have*	• Some owners are unclear as to their obligations.	• Minimal change compared to the status quo.	• Changes such as timeframe extensions, exemptions and low-cost retrofits for certain buildings should not impact clarity of	• Owners will be clear as to their obligations (or lack thereof) once changes are implemented, and	• Owners have no obligations to

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confidence to carry out remediation work.	• Some owners are concerned that system settings may change over time. 0	0	obligations significantly (subject to clear communication with owners and drafting of legislation). 0	have more clarity due to their obligations being specific to their particular building/risk profile. +	remediate under the *Building Act 2004*. N/A
Administrative simplicity – *the system is simple to administer, and the costs of doing so are reasonable.*	• Some challenges, for example with enforcing remediation deadlines or supporting building owners. 0	• Reduced number of EPBs in future may reduce administration cost/complexity for those EPBs. 0	• Extension of some timeframes, identification and removal of some current EPBs and low-cost retrofits will result in administrative cost (particularly in the short-term). -	• Giving more specific consideration to the components of risk for each earthquake-prone building (seismic zones, building vulnerability classes and consequence) and having a spectrum of differing mitigation requirements will add administrative complexity. Conversely, having fewer buildings with mandatory partial or full retrofitting requirements will be simpler to administer once the new system is implemented. - -	• No EPB system to administer. • Some government involvement such as incentives, information, case management. +
Overall score	0	0	+	++	- -

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