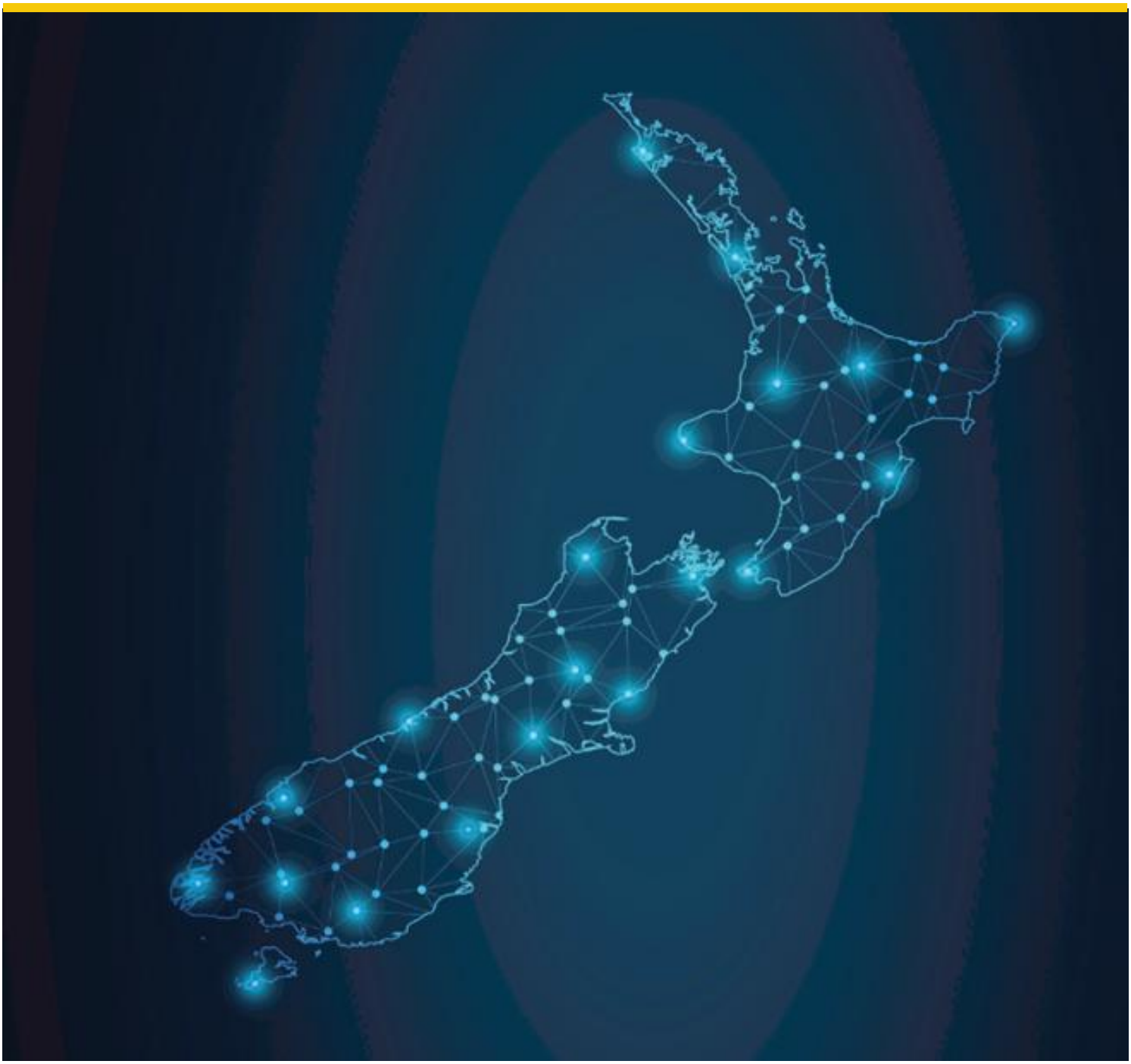
CBA Results for Revised Seismic Risk Mitigation Approach for New Zealand's Earthquake-Prone Buildings

Prepared for Ministry of Business, Innovation & Employment

Prepared by Beca Limited

5 August 2025



Contents

1 Introduction

The Beca project for MBIE to consider the benefits and costs for various options for implementation of earthquake prone buildings (EPB) policy has been completed (report entitled *Economic Analysis of New Zealand's Earthquake Prone Buildings*, dated 30 May 2025). That project considered the impacts on the buildings identified in six centres. MBIE has now commissioned Beca to extend that project methodology to the inventory of currently identified earthquake prone buildings throughout New Zealand and, in particular, to consider several new policy options including a preferred option. The terms of reference for this work are generally covered in the Beca proposal letter to MBIE, dated 27 June 2025, although some variations to the detail of this scope of work have occurred as the project has progressed.

Considering a building inventory now including over 5,000 buildings has been a major undertaking, completed under significant time constraints. Although we have taken all care in completing our work, the possibility of errors is heightened, given the lack of time to complete verification of all results and the inventory inputs.

Although Beca has implemented the analysis work, the policy options and the output data requirements have been largely driven by the MBIE team.

As part of this project, Beca has completed a review of some of the input from the previous project, particularly for the estimates of building occupancy. For most buildings, this has resulted in a reduction in lives at risk and therefore in the BCRs previously determined. As the occupancies do not vary across the various policy options, it is the relative impact of the change in BCRs that should be focused on rather than the absolute numbers that have been calculated. This was also a recommendation of the previous project.

We note that we have only considered the buildings that are currently on the EPB lists and that some authorities are still in the process of evaluating their lists. No attempt has been made to scale up the inventory to take into account the incomplete nature of these inventories. This might be particularly relevant to centres in previously considered low seismicity regions such as Dunedin.

This report summarises results for both approaches: the traditional CBA and the APoE BCRs. Beca cautions sole reliance on the traditional CBA approach to compare the impacts of policy options in evaluating earthquake prone building matters, especially if reliance is placed on the actual numbers rather than the relative impacts. This applies to the costs as well as the benefits. As identified in the brief for the earlier project, the impacts from these potentially, high impact but low likelihood occurrences are not well addressed by a traditional CBA approach. The results (particularly around the benefits achieved from preventing fatalities and injuries) from both need to be considered to fully appreciate the impacts. While the cost impact of the various options is an important consideration, sight should not be lost of the benefit impacts (fatalities and injuries prevented) that are estimated.

The results of the APoE BCRs and traditional CBA are presented per region and per policy option.

This report is focused primarily on presenting the results from our analyses. There is deliberately little attempt to discuss the results or to reiterate the limitations of such analyses. This is as a result of the time pressures which have necessitated a focus on the production of results rather than the presentation of a standalone report. All of the limitations that were discussed in the Beca report dated 30 May 2025 equally apply to this latest work.

2 Inventory Stock

This section includes summary tables (Tables 1, 2, 3, 4 and 5) and figures (Figures 1, 2, 3 and 4) of the current number of buildings on the Earthquake Prone Buildings (EPB) Register, located here:

https://epbr.building.govt.nz/. The distribution of EPBs is shown across the 16 different regions across New Zealand.

There are 56 out of 66 Territorial Authorities with EPBs on the register and ten Territorial Authorities without EPBs.

Table 1 – Beca Typology list definitions

Typology	
1	Timber frames + URM elements
2	URM 1-storey, GFA < 2000m^2
3a	URM 2-storey, GFA < 2000m^2
3b	URM ≥ 3 storey, GFA < 2000m^2
4a	URM 1-2 storey, GFA > 2000m^2
4b	URM ≥ 3 - 7 storey, GFA > 2000m^2
5	RC walls (low-rise), 1-2 storeys
6a	RC walls (mid-rise), 3 storeys
6b	RC walls (mid-rise), ≥ 4 storeys
7a	RC frame with masonry infills, 1-2 storey
7b	RC frame with masonry infills, ≥ 3 storeys
8a	Pre-1976 RC Frame, 1- 2 storey
8b	Pre-1976 RC Frame, ≥ 3 storey
9	Post-1976 RC frame w precast
10	Steel MRF + heavy cladding
	Total

Table 2 – Earthquake Prone Buildings split by Region and Beca Typology

Beca Typology	Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatū-Whanganui	Wellington	Tasman	Nelson	Marlborough	West Coast	Canterbury	Otago	Southland	Total
1	0	265	28	30	0	14	5	41	154	6	5	2	29	80	9	9	**677**
2	0	338	184	54	9	69	30	296	154	17	6	24	70	168	60	112	**1591**
3	0	413	56	33	11	34	12	153	137	7	13	9	27	123	92	109	**1229**
4	0	18	7	3	2	2	1	7	20	0	1	0	0	15	14	7	**97**
5a	0	0	8	11	1	2	2	6	38	0	3	1	8	10	8	6	**104**
5b	0	127	72	26	0	7	13	68	92	7	5	2	16	120	11	25	**591**
6a	0	20	0	0	0	0	0	4	6	0	0	0	0	0	2	0	**32**
6b	0	8	1	4	0	1	1	1	23	0	0	0	0	2	1	0	**42**
7a	0	52	38	8	5	10	6	38	62	5	4	0	18	44	3	16	**309**
7a	0	15	2	1	4	1	1	3	20	0	0	0	1	5	5	2	**60**
8a	0	43	12	0	0	2	2	11	20	0	4	1	2	35	0	7	**139**
8b	0	27	14	0	1	0	3	1	28	0	1	0	1	7	0	1	**84**
9a	0	1	0	0	0	0	0	0	0	0	0	0	0	12	0	0	**13**
9b	0	3	3	0	0	0	0	0	8	0	0	0	0	2	2	0	**18**
10	0	21	8	2	2	5	0	19	40	2	1	1	4	106	4	11	**226**
Total	**0**	**1351**	**433**	**172**	**35**	**147**	**76**	**648**	**802**	**44**	**43**	**40**	**176**	**729**	**211**	**305**	**5212**

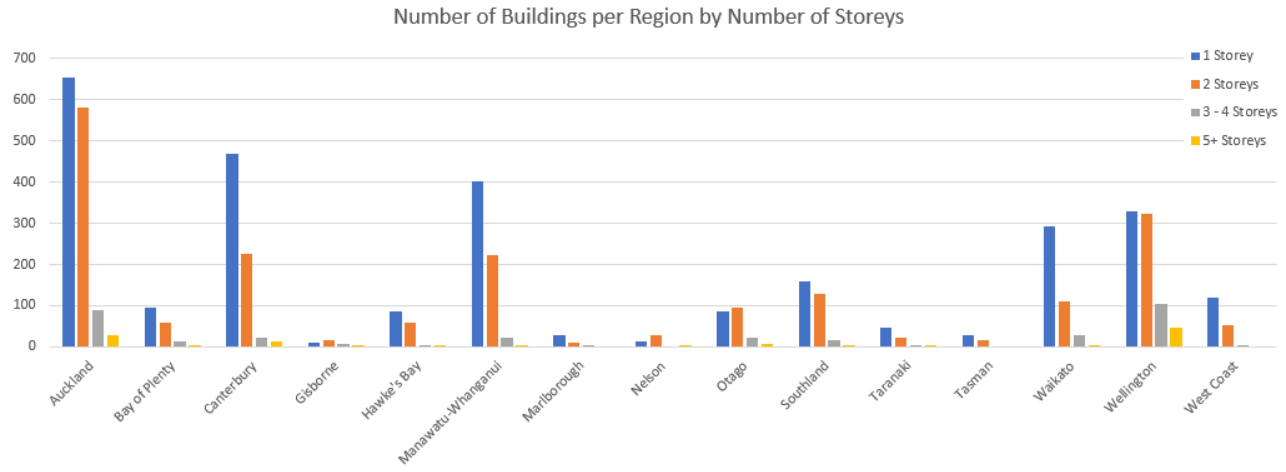


Figure 1 – Number of stories of EPB by region

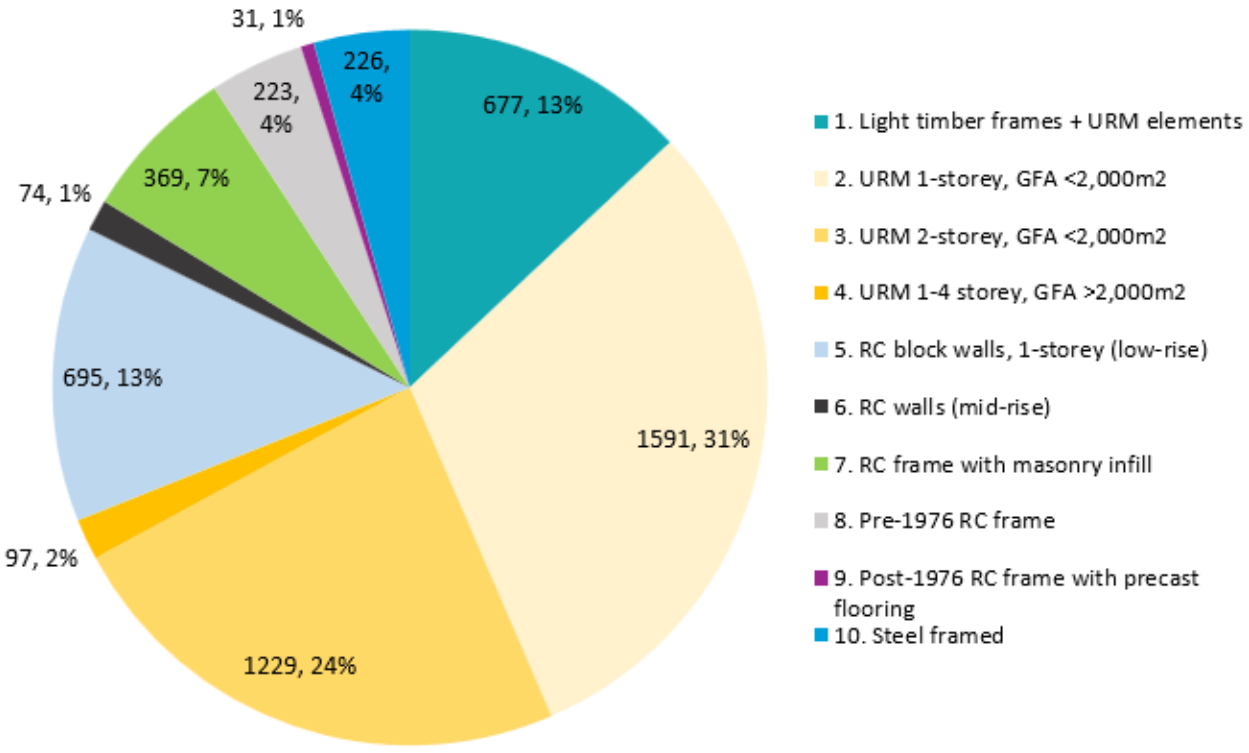


Figure 2 – Pie chart showing the distribution of EPB by the Beca Typology list

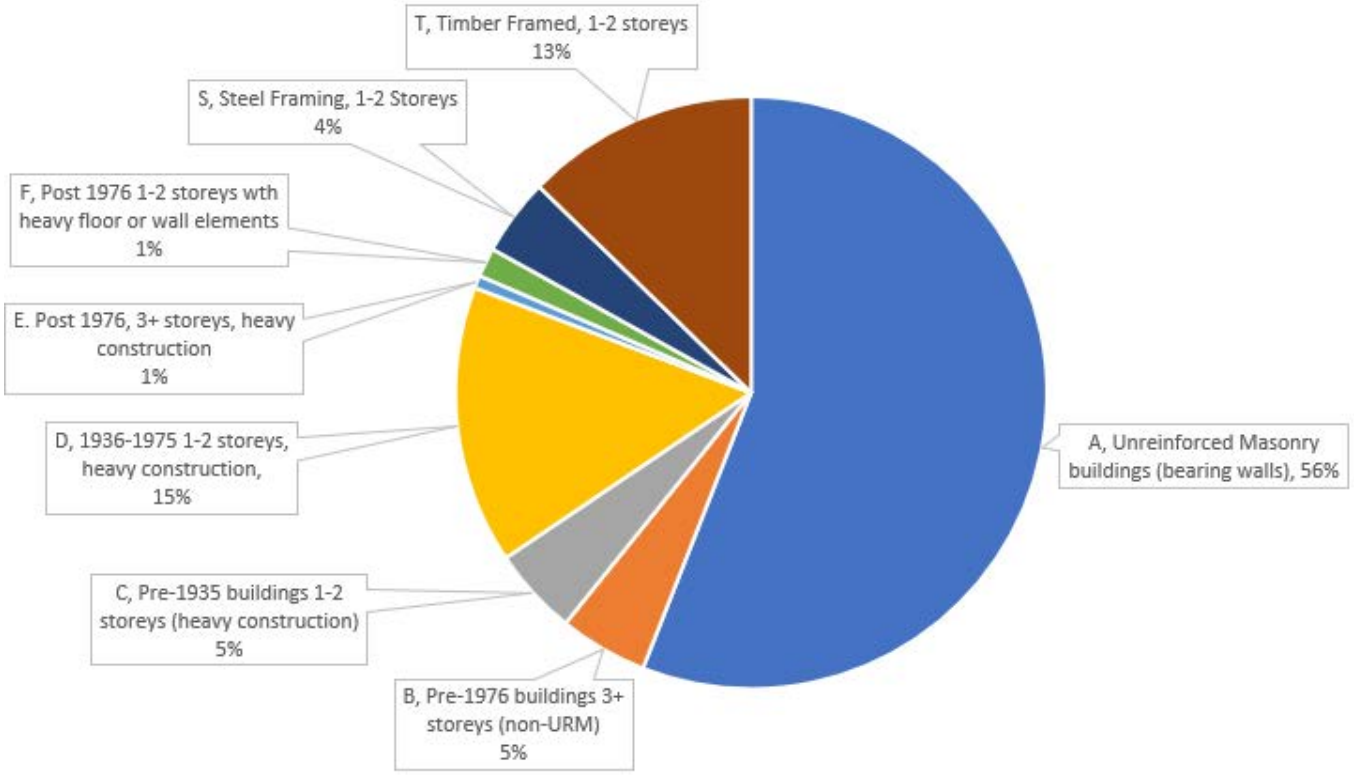


Figure 3 – Pie chart showing the distribution of EPB by the MBIE typology list

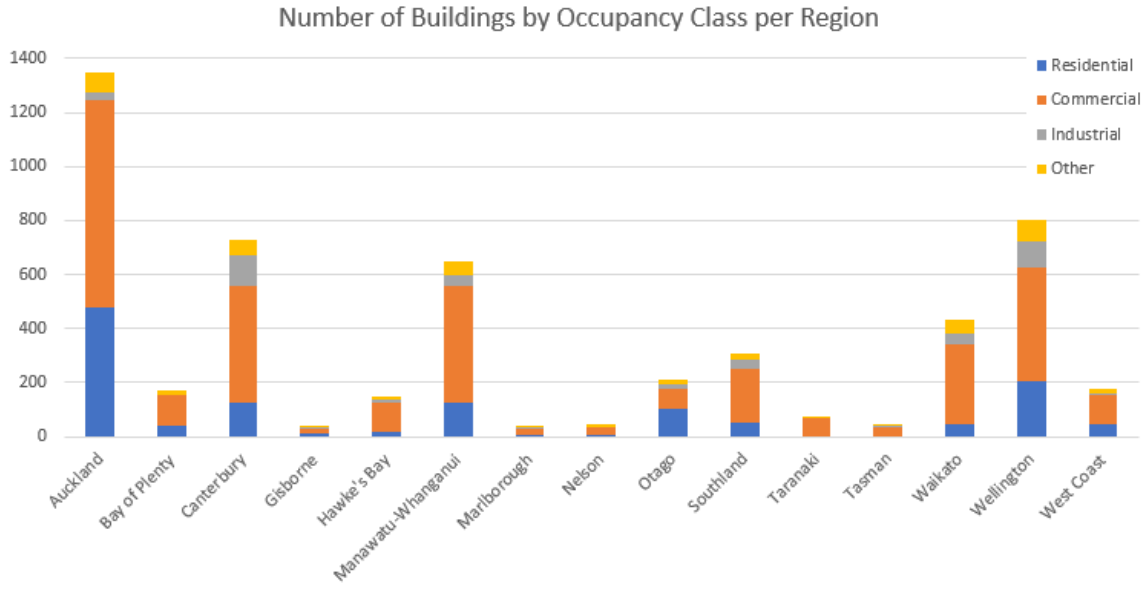


Figure 4 – Occupancy class stacked column chart by region

Table 3 – Number of EPB buildings distributed by the MBIE typology list by region

Category	Construction Era and Type	1. Northland	2. Auckland	3. Waikato	4. Bay of Plenty	5. Gisborne	6. Hawke's Bay	7. Taranaki	8. Manawatū-Whanganui	9. Wellington	10. Tasman	11. Nelson	12. Marlborough	13. West Coast	14. Canterbury	15. Otago	16. Southland	Total
A	Unreinforced Masonry buildings (bearing walls)	0	769	247	90	22	105	43	456	311	24	20	33	97	306	166	228	**2917**
B	Pre-1976 buildings of three or more storeys (non-URM)	0	72	20	10	5	2	6	12	96	0	1	1	2	11	8	6	**252**
C	Pre-1935 buildings of one or two storeys (heavy construction)	0	54	23	12	5	7	3	19	56	3	4	1	19	16	9	18	**249**
D	1936 to 1975 buildings of one or two storeys of heavy construction	0	163	95	24	1	14	14	99	140	7	8	3	21	158	13	32	**792**
E	Post-1976 buildings of three or more storeys of heavy construction - CTV	0	8	3	2	0	0	0	1	11	0	0	0	1	8	2	0	**36**
F	Post-1976 one or two storey construction with heavy floor or wall elements	0	3	10	2	0	0	5	2	5	2	4	0	3	46	0	1	**83**
S	Steel-framed building of one or two storeys (light floors and cladding)	0	20	7	2	2	5	0	19	37	2	1	1	4	104	4	11	**219**
T	Timber-framed one or two storey buildings	0	262	28	30	0	14	5	40	146	6	5	1	29	80	9	9	**664**
-	**Total**	**0**	**1351**	**433**	**172**	**35**	**147**	**76**	**648**	**802**	**44**	**43**	**40**	**176**	**729**	**211**	**305**	**5212**

Table 4 – Number of Heritage EPBs (as identified within MBIE's EPB register)

Regions		Number of Heritage Buildings	% Heritage Buildings of EPB	Number of EPB
1	Northland	0	0.0%	0
2	Auckland	534	39.5%	1351
3	Waikato	20	4.6%	433
4	Bay of Plenty	7	4.1%	172
5	Gisborne	0	0.0%	35
6	Hawke's Bay	4	2.7%	147
7	Taranaki	2	2.6%	76
8	Manawatū-Whanganui	28	4.3%	648
9	Wellington	176	21.9%	802
10	Tasman	5	11.4%	44
11	Nelson	16	37.2%	43
12	Marlborough	2	5.0%	40
13	West Coast	14	8.0%	176
14	Canterbury	62	8.5%	729
15	Otago	23	10.9%	211
16	Southland	63	20.7%	305
	Total	**956**	**18.3%**	**5212**

Table 5 – Number of Priority Buildings (as identified within MBIE's EPB register)

Regions		Number of Priority Buildings	% Priority Buildings of EPB	Number of EPB
1	Northland	0	0.0%	0
2	Auckland	0	0.0%	1351
3	Waikato	252	58.2%	433
4	Bay of Plenty	78	45.3%	172
5	Gisborne	0	0.0%	35
6	Hawke's Bay	22	15.0%	147
7	Taranaki	9	11.8%	76
8	Manawatū-Whanganui	170	26.2%	648
9	Wellington	163	20.3%	802
10	Tasman	14	31.8%	44
11	Nelson	11	25.6%	43
12	Marlborough	0	0.0%	40
13	West Coast	70	39.8%	176
14	Canterbury	288	39.5%	729
15	Otago	10	4.7%	211
16	Southland	190	62.3%	305
	Total	**1277**	**24.5%**	**5212**

3 Exposure

The exposure classification definitions shown in Table 6 were applied to Options 3.1, 3.2, 3.3 and 3.4.

Table 6 – Exposure Categories and number of people per building

Exposure Categories - Number of people per building		Exposure Category 1 - Low	Exposure Category 2 - Medium	Exposure Category 3 - High
Residential	RES1, RES2, RES3A, RES3B, RES3C, RES3D, RES3E, RES3F, MULTI-RES	4	More than 4 and less 120	120
Commercial	COM3,4,5,6,7,8,10,13 MULTI-COM, UTI1, REL1	3	More than 3 and less 200	200
Commercial – large	COM1, COM11, COM11, COM9, GOV1, GOV2, EDU1, EDU1	5	More than 5 and less than 750	750
Industrial	IND1, IND2, IND3	3	More than 3, and less than 240	240

In addition, the small towns are considered low exposure. The Table 8 gives the small regional towns, which will be allocated to the EPB list.

There are 185 small regional towns, 14 medium towns, 16 larger towns and six metro cities.

3.1 Change to the Exposure definition

Following a meeting with MBIE on 16/07/2025 there was a change to the 'exposure' definition. The updated exposure definitions as defined by MBIE are presented in Table 7.

A new option, Option 3.1B, was introduced to reflect the change in definition of exposure. This definition is summarised below and only applies to Option 3.1B. Due to time constraints the other Options 3.1, 3.2, 3.3 and 3.4 use the definitions as defined above in Section 3.

The risk model is based on occupancy rates for different town sizes (small regional, medium, and large towns). For 3.1B, the same approach to occupancy rates has been adopted as in 3.1—using just town size rather than exposure classes as the basis. Town size is part of the exposure measurement.

Table 7 – Revised Exposure definitions as provided by MBIE that apply to Option 3.1B only

	Category A - URM	Category B and E -Concrete three or more storeys.
Low Exposure	Non-priority building *AND* 1-2 storeys *OR* All buildings in Small Regional Centres (Stats NZ FUA 2018) *ACTION* Display EPB Notice	All buildings 3 or more storeys in Small Regional Centres (Stats NZ FUA 2018) *ACTION* Display EPB Notice
Regular Exposure	Non-priority building *AND* 3 or more storeys, or greater than 10m height *BUT* less than 3000m2 GFA *OR* Priority building *AND* 1-2 storeys or less than 10m height	3 or more storeys *AND* less than 3000m2 GFA *ACTION* Targeted Retrofit

	ACTION Façade Securing	
High Exposure	Priority building *AND* 3 or more storeys, *OR* Greater than or equal to 3000m2 GFA (excepting industrial or primary industry use) *ACTION* Retrofit to EPB Threshold	3 or more storeys *AND* greater than or equal to 3000m2 GFA (excepting industrial or primary industry use) *ACTION* Targeted Retrofit

Table 8 – List of Small regional towns

Small Regional Towns		
Akaroa	Lincoln	Rotherham
Albury	Little River	Roxburgh
Alexandra	Loburn	Ruatapu
Amberley	Longburn	Runanga
Arnold Valley	Luggate	Saint Bathans
Arrowtown	Lyttelton	Sanson
Arthurs Pass	Mangatarata	Shannon
Ashhurst	Maraekakaho	Sheffield
Athol	Marlborough	Southbridge
Balfour	Martinborough	Springfield
Banks Peninsula	Marton	Springs Junction
Bluff	Matamata	Stillwater
Brightwater	Mataura	Stratford
Bulls	Middlemarch	Tai Tapu
Burnham	Moana	Taihape
Carterton	Monowai	Takaka
Clyde	Mossburn	Takanini
Coalgate	Motueka	Tapora
Collingwood	Motukarara	Taumarunui
Cromwell	Mount Maunganui	Te Aroha
Culverden	Mt Ruapehu	Te Horo
Akaroa	Luggate	Sheffield
Albury	Lyttelton	Southbridge
Alexandra	Mangatarata	Springfield
Amberley	Maraekakaho	Springs Junction
Arnold Valley	Marlborough	Stillwater
Arrowtown	Martinborough	Stratford
Arthurs Pass	Marton	Tai Tapu
Ashhurst	Matamata	Taihape
Athol	Mataura	Takaka

Small Regional Towns		
Balfour	Middlemarch	Takanini
Banks Peninsula	Moana	Tapora
Bluff	Monowai	Taumarunui
Brightwater	Mossburn	Te Aroha
Bulls	Motueka	Te Horo
Burnham	Motukarara	Te Karaka
Carterton	Mount Maunganui	Te Kuiti
Clyde	Morrinsville	Temuka
Coalgate	Mt Ruapehu	Te Puke
Collingwood	Murchison	Thames
Cromwell	Muriwai	Tirau
Culverden	Naseby	Tokomaru Bay
Cust	Ngahere	Tuatapere
Dannevirke	Ngakuru	Upper Moutere
Darfield	Ngatea	Waihi
Diamond Harbour	Nightcaps	Waihi Beach
Dipton	Ohai	Waikari
Drury	Ohakune	Waikouaiti
Duntroon	Ohaupo	Waikuku Beach
Edendale	Ohoka	Waimana
Fairlie	Okains Bay	Gore
Featherston	Omakau	Greendale
Foxton	Omarama	Greytown
Foxton Beach	Rotherham	Haast
Geraldine	Roxburgh	Halcombe
Glentunnel	Ruatapu	Hamurana
Lincoln	Runanga	Hanmer Springs
Little River	Saint Bathans	Harihari
Loburn	Sanson	Haumoana
Longburn	Shannon	Havelock
Hawarden	Ross	
Helensville	Waimarama	
Himatangi Beach	Waiouru	
Hokitika	Waipara	
Hororata	Waipawa	
Inchbonnie	Waipukurau	
Inglewood	Wairoa	
Katikati	Waiuku	
Kerepehi	Wakefield	

Small Regional Towns		
Kimbell	Wallacetown	
Kirwee	Warkworth	
Kurow	Wellsford	
Lake Tekapo	Westport	
Leeston	Winton	
Leithfield	Whakapapa Village	
Opotiki	Whakatane	
Orewa	Whangaparaoa	
Otaki	Wharanui	
Otautau	Whataroa	
Oxford	Woodend	
Paeroa	Woodville	
Pahiatua	Wyndham	
Papakura	Dunsandel	
Patetonga	Eketahuna	
Picton	Franz Josef Glacier	
Pigeon Bay	Kokatahi	
Piha	Lake Hawea	
Pleasant Point	Omokoroa	
Port Chalmers	Twizel	
Prebbleton		
Putaruru		
Raetihi		
Rai Valley		
Rakaia		
Ranfurly		
Reefton		
Riverhead		
Riverton		
Rongotea		

Table 9 defines the metro/large/medium regional centres. These will be allocated to the EPB list.

Table 9 - List of Metro/Large/Medium towns/cities

List of Metro/Large/Medium towns/cities		
Metro	**Large**	**Medium**
Auckland (Pukekohe, Hibiscus Coast)	Gisborne	Ashburton
Christchurch (Rolleston, Rangiora, Kaiapoi)	Hastings	Blenheim
Dunedin (Mosgiel)	Invercargill	Cambridge
Hamilton	Kapiti Coast	Feilding
Tauranga	Napier	Greymouth
Wellington (Porirua, Lower Hutt, Upper Hutt)	Havelock North	Levin
	Nelson	Masterton
	New Plymouth	Oamaru
	Palmerston North	Queenstown
	Rotorua	Taupō
	Whanganui	Te Awamutu
	Whangārei	Timaru
		Tokoroa
		Whakatāne

4 Adjusted Loss Model Assumptions

4.1 Adjustments of Occupancy Rates: People per building

We revised the day and night occupancy rates for small towns, medium and large towns for each occupancy class. The revised values, together with the original assumptions are provided in Table 10.

Table 10 – Peak occupancy rates and time-specific rates for various use categories

Occupancy class	Description occupancy class	Peak occupancy [m² per person] GNS, Scheele et al., 2023-	Beca's Report 30/5/2025	Beca adjusted rates 04/07/2025			Proportion of peak at 10am weekday	Proportion of peak at 7pm weekday
				Large Towns, Metro	Medium Towns	Small Town		
RES1	Single-family Dwelling	30	30	30	30	30	0.4	0.7
RES1	Apt., Multi-family Dwelling: Duplex	10	20	20	30	30	0.4	0.7
RES3A	Apt., Multi-family Dwelling: Triplex/Quad	10	20	20	25	30	0.2	0.5
RES3B	Apt., Multi-family Dwelling: 5-9 units	10	20	20	25	30	0.2	0.5
RES3C	Apt., Multi-family Dwelling: 10-19 units	10	20	20	25	30	0.2	0.5
RES3D	Apt., Multi-family Dwelling: 20-49 units	10	20	20	25	30	0.2	0.5
RES3E	Apt., Multi-family Dwelling: 50+ units	10	20	20	25	30	0.2	0.5
RES3F	Multi-use: Retail + RESID	10	20	20	25	30	0.2	0.5
MULTI-RES	Department store, shopping mall	2	4	10	20	20	0.8	0.05
COM3	Garage, Repair	20	30	10	30	30	0.75	0.05
COM4	Office	14	14	14	30	30	0.9	0.05
COM6	Hospital	20	20	20	20	20	1	1
COM7	Medical Office/Clinic	20	20	20	20	20	1	0.2
COM8	Restaurant	2	10	10	10	10	0.8	0.8
COM9	Movie theatre, Opera House, Galleries, Exhibitions	2	4	4	10	15	0.1	0.2
COM10	Parking Garage	10	18	20	25	30	0.05*	0.05*
COM11	Swimming pools, sport centre, community centres	10	15	15	20	25	0.5	0.05
COM12	Grandstand, Racecourse	2	4	4	10	15	0.1	0.05

Occupancy class	Description occupancy class	Peak occupancy [m^2 per person] GNS, Scheele et al., 2023-	Beca's Report 30/5/2025	Beca adjusted rates 04/07/2025			Proportion of peak at 10am weekday	Proportion of peak at 7pm weekday
				Large Towns, Metro	Medium Towns	Small Town		
COM13	Small retail shops, NZ corner shop	2	30	30	30	35	0.8	0.2
MULTI-COM	Multi-use: Retail + COMM	15	25	20	25	30	0.2	0.5
UTI1	Substation, suburb	100	100	100	100	100	0.05*	0.05*
IND1	Factory	30	30	40	40	40	0.7	0.05
IND2	Industrial Warehouse, heavy	30	30	50	50	50	0.7	0.05
IND3	Lab, Food/Drugs/Chem 1-storey	30	30	30	30	30	0.7	0.05
REL1	Church	2	4	4	4	4	0.05	0.05
GOV1	Town hall, Main Railway station	4	4	4	4	4	0.5	0.05
GOV2	Police station, Fire stations	14	14	25	25	25	0.5	0.5
EDU1	High-school, Primary and Early childcare	2	4	4	4	4	0.95	0
EDU2	University classrooms	2	2	4	4	4	0.8	0.05

*Note the minimum is capped at a rate of 0.05.

4.2 Business Interruption Losses

Through the course of this work we have encountered some previous assumptions that might be expected to lead to an overstatement of the indirect losses associated with business disruption. This is one component that inputs into the overall 'benefits' side of the benefit to cost ratio, along with People and Property avoidance of losses.

The results have previously been communicated as being most appropriate when being used relative to one another, rather than in absolute value comparisons. The assumptions have not been adjusted in this latest work to maintain the concept of results being comparable relative to one another.

5 Revised Risk Mitigation Approach

This section summarises the definition of the revised risk mitigation approach instructed by MBIE to Beca.

The following are the naming conventions of the options considered:

- Status Quo – 34%*NBS* strengthening to all EPB buildings
- Option 1 – 'Minor change' Same as above, except Simple Strengthening for 1-2 storey URM buildings
- Option 3 – 'More Risk-focused' (revised approach as below)
- Option 4 – 'Doing nothing'

The following sub-options were considered as part of this analysis:

- **Option 3.1:** New seismic zones (refer Figure 5 fore proposed new zones) and 1-2 storey URM for Med and High zones kept inside of scope plus all Low zone buildings outside scope
- **Option 3.1B:** New seismic zones and 1-2 storey URM removed on non-priority routes in all zones plus all Low zone buildings outside scope. Adopts the revised 'Exposure Classification' as defined in Section 3.1.
- **Option 3.2:** New seismic zones and 1-2 storey URM removed in all zones plus all Low zone buildings outside scope
- **Option 3.3:** 2017 seismic zones and 1-2 storey URM for Med and High zones kept inside of scope plus all Low zone buildings outside scope
- **Option 3.4:** 2017 seismic zones and 1-2 storey URM removed in all zones plus all Low zone buildings outside scope

Figure 5 – Draft Proposed Seismic Risk Zones

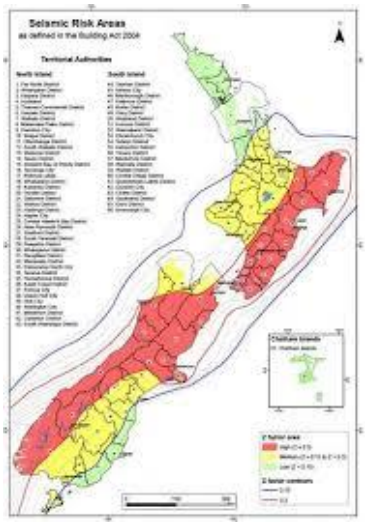


Figure 6 – 2017 Seismic Risk Zones

A summary of Option 3 is:

- Removal of retrofit to Category C, D, F, S and T in Medium and High seismic zone, and
- Removal of retrofit to buildings in small towns, and
- Removal of retrofit in Low Zone buildings (as above defined 3.1-3.4)

- Keep Category A, B and E in Medium and High seismic zone, and apply retrofit as follows:
  - Targeted retrofit to 1-2 storey URM buildings for Category A in Medium and High seismic Zone (Scope as per Holmes/DTC sketches), applies to the buildings as defined in the options description above.
  - 34%*NBS* for URM buildings in High Zone with High Exposure (or simple strengthening for 1-2 storey URM), and
  - Targeted retrofit to highly vulnerable concrete buildings greater and equal to three storeys of Category B and E with Medium or High Exposure in Medium or High Seismic Zone (as per Holmes/Beca report: targeted RC retrofit about 80% of cost of 34%*NBS* option strengthening), and
  - No retrofit to lower vulnerable buildings or vulnerable multi-storey concrete buildings (Category C, D, F) in all Zones and all Exposures, and
- Remove buildings infrequent use (COM3 workshop/garage and UTI1 suburb substations or plant).

The Figure 7 was provided by MBIE summarising the risk mitigation matrices for the approach:

Revised risk mitigation matrices for Minister's preferred approach

Medium Zone matrix:

Increasing Building Vulnerability →

Increasing Consequence ↓	Class 1 – Lower vulnerability buildings	Class 2A – Vulnerable Multi-storey concrete buildings	Class 2B – Highly vulnerable multi-storey concrete buildings	Class 2C – Highly Vulnerable URM buildings
Category 1 *Low exposure*	A – EPB status removed	B – Risk notification	B – Risk notification	B – Risk notification
Category 2 *Regular exposure*	A – EPB status removed	B – Risk notification	C – Targeted Retrofit	C – Façade securing
Category 3 *High exposure*	A – EPB status removed	B – Risk notification	C – Targeted Retrofit	C – Façade securing

To remove EPB notice: *Targeted Retrofit*

High Zone matrix:

Increasing Consequence ↓	Class 1 – Lower vulnerability buildings	Class 2A – Vulnerable multi-storey concrete buildings	Class 2B – Highly vulnerable multi-storey concrete buildings	Class 2C – Highly Vulnerable URM buildings
Category 1 *Low exposure*	A – EPB status removed	B – Risk notification	B – Risk notification	B – Risk notification
Category 2 *Regular exposure*	A – EPB status removed	B – Risk notification	C – Targeted Retrofit	C – Façade securing
Category 3 *High exposure*	A – EPB status removed	B – Risk notification	C – Targeted Retrofit	D – Retrofit to EPB Threshold *(Simple strengthening for 1-2 storey)*

To remove EPB notice: *Retrofit to EPB Threshold*

Figure 7: A summary of the risk mitigation approach was provided by MBIE for Medium and High seismicity zones:

6 Final Inventory for Option 3.1B

Table 11 provides a summary of the numbers of buildings that have been considered in the evaluation of impacts for Option 3.1B.

Table 11 – Summary table of the inventory list for Option 3.1B. Refer to Table 17 for the total number of buildings considered for other options.

Category	Construction Era and Type	1. Northland	2. Auckland	3. Waikato	4. Bay of Plenty	5. Gisborne	6. Hawke's Bay	7. Taranaki	8. Manawatū-Whanganui	9. Wellington	10. Tasman	11. Nelson	12. Marlborough	13. West Coast	14. Canterbury	15. Otago	16. Southland	Total
A	Unreinforced Masonry buildings (bearing walls)	-	-	55	16	2	11	-	73	97		7		27	118	25	90	521
B	Pre-1976 buildings of three or more storeys (non-URM)	-	-	17	9	5	2	4	8	95		1	1	2	11	8	4	167
C	Pre-1935 buildings of one or two storeys (heavy construction)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
D	1936 to 1975 buildings of one or two storeys of heavy construction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
E	Post-1976 buildings of three or more storeys of heavy construction - CTV	-	-	3	2	-	-	-	1	11	-	-	-	-	8	2		27
F	Post-1976 one or two storey construction with heavy floor or wall elements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
S	Steel-framed building of one or two storeys (light floors and cladding)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
T	Timber-framed one or two storey buildings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

-	**Total**	-	-	**75**	**27**	**7**	**13**	**4**	**82**	**203**	**0**	**8**	**1**	**29**	**137**	**35**	**94**	**715**

6.1 Option 3.1B summary of exposure classifications

Table 12 gives the distribution of exposure classifications based on **Medium** seismicity for Option 3.1B

Table 12 – Medium seismicity building numbers for each Exposure classification for Option 3.1B

		Category A - URM	Category B- pre-1976 Reinforced Concrete 3 or more storeys	Category E- post 1976 Reinforced Concrete 3 or more storeys
Low Exposure	Exposure definition as provided by MBIE	Non-priority building *AND* 1-2 storeys *OR* All buildings in Small Regional Centres (Stats NZ FUA 2018) ACTION: Display EPB Notice	All buildings 3 or more storeys in Small Regional Centres (Stats NZ FUA 2018) ACTION: Display EPB Notice	All buildings 3 or more storeys in Small Regional Centres (Stats NZ FUA 2018) ACTION: Display EPB Notice
	Number of buildings	**904**	**6**	**0**
Regular Exposure	Exposure definition as provided by MBIE	Definition: Non-priority building *AND* 3 or more storeys, or greater than 10m height *BUT* less than 3000m2 GFA *OR* Priority building *AND* 1-2 storeys or less than 10m height ACTION: Façade Securing	3 or more storeys *AND* less than 3000m2 GFA ACTION: Targeted Retrofit	3 or more storeys *AND* less than 3000m2 GFA ACTION: Targeted Retrofit
	Number of buildings	**299**	**27**	**10**
High Exposure	Exposure definition as provided by MBIE	Priority building *AND* 3 or more storeys, *OR* Greater than or equal to 3000m^2 GFA (excepting industrial or primary industry use) ACTION: Retrofit to EPB Threshold	3 or more storeys *AND* greater than or equal to 3000m^2 GFA (excepting industrial or primary industry use) ACTION: Targeted Retrofit	3 or more storeys *AND* greater than or equal to 3000m^2 GFA (excepting industrial or primary industry use) ACTION: Targeted Retrofit
	Number of buildings	**47**	**30**	**5**
Total		**1250**	**63**	**15**

Table 13 gives the distribution of exposure classifications based on **High** seismicity for Option 3.1.B

Table 13 – High seismicity building numbers for each Exposure classification for Option 3.1.1

		Category A - URM	Category B- pre-1976 Reinforced Concrete 3 or more storeys	Category E- post 1976 Reinforced Concrete 3 or more storeys
Low Exposure	Exposure definition as provided by MBIE	Non-priority building *AND* 1-2 storeys *OR* All buildings in Small Regional Centres (Stats NZ FUA 2018) ACTION: Display EPB Notice	All buildings 3 or more storeys in Small Regional Centres (Stats NZ FUA 2018) ACTION: Display EPB Notice	All buildings 3 or more storeys in Small Regional Centres (Stats NZ FUA 2018) ACTION: Display EPB Notice
	Number of buildings	**710**	**6**	**1**
Regular Exposure	Exposure definition as provided by MBIE	Definition: Non-priority building *AND* 3 or more storeys, or greater than 10m height *BUT* less than 3000m^2 GFA *OR* Priority building *AND* 1-2 storeys or less than 10m height ACTION: Façade Securing	3 or more storeys *AND* less than 3000m^2 GFA ACTION: Targeted Retrofit	3 or more storeys *AND* less than 3000m^2 GFA ACTION: Targeted Retrofit
	Number of buildings	**140**	**82**	**2**
High Exposure	Exposure definition as provided by MBIE	Priority building *AND* 3 or more storeys, *OR* Greater than or equal to 3000m^2 GFA (excepting industrial or primary industry use) ACTION: Retrofit to EPB Threshold	3 or more storeys *AND* greater than or equal to 3000m^2 GFA (excepting industrial or primary industry use) ACTION: Targeted Retrofit	3 or more storeys *AND* greater than or equal to 3000m^2 GFA (excepting industrial or primary industry use) ACTION: Targeted Retrofit
	Number of buildings	**35**	**28**	**10**
Total		**885**	**116**	**13**

7 Retrofit Costs

The basis for the targeted retrofit scope for URM and concrete buildings was as follows:

7.1 Targeted Retrofit for URM Buildings

Basis of scope for Targeted Retrofit: Sketches provided by DTC/Holmes '250703 Targeted Retrofit diagrams for Cost Proportion benchmarking.pdf' provided dated 3 July 2025, extends scope for zones 1-3 for 1-2 storey URM buildings. The scope of these sketches largely relates to securing of parapets and façade on the street frontages only.

The cost estimates presented in Table 14 are similar to those previously estimated by the Beca quantity surveyor undertaken as part of the 'policy options' review for façade securing. For a Medium seismicity zone, the scope of this work as defined on the DTC/Holmes sketches referred to above is similar to this, with the addition of additional cavity ties to street frontage buildings.

Table 14 – Cost estimates for URM Targeted Retrofit in $/m^2

Typology		Residential	Commercial	Industrial	Hospitals
		[NZ$/m^2]	[NZ$/m^2]	[NZ$/m^2]	[NZ$/m^2]
2	URM 1 storey	550	550	550	1090
3	URM 2 storey	470	470	470	940

Targeted URM retrofit schemes implemented via Simple Securing compared to a 34%*NBS* scheme are estimated to reduce by approximately 70-85%. There is additional scope associated with building on a corner, as it has two sides requiring retrofit, albeit with less intervention to the parapet on one side. It has been assumed that corner buildings make up 10% of the total.

For URM buildings of three or more storeys, there were no targeted schemes used because these buildings are often unique/bespoke and require engineering design. This is consistent with the DTC/Holmes Targeted Retrofit report.

7.2 Targeted Retrofit for Reinforced Concrete Buildings

Basis of scope for Targeted Retrofit: Report **"**Exploring Targeted Retrofit Approaches for RC buildings in NZ – Feasibility Study_v02_Draft_June 2025 provided by Holmes/Beca.

In the above report, the targeted retrofit scope has been assumed to be 80% of that required to achieve a 34%*NBS* building. These numbers are presented in Table 15.

Table 15 – Cost estimates for RC buildings Targeted Retrofit in $/m^2

Typology		Residential	Commercial	Industrial	Hospitals
		[NZ$/m^2]	[NZ$/m^2]	[NZ$/m^2]	[NZ$/m^2]
5	RC shear wall (low-rise)	1930	1950	1880	3890
6	RC shear walls (mid-rise)	1005	1180	600	2360
7	RC frame with masonry infill	1500	1665	1090	3330
8	Pre-1976 RC Frames	1600	1770	1200	3900
9	Post-1976 RC Frames	1060	1240	1036	2480

7.3 Regional Variations

The previous cost estimates for the scope of the original study across six towns captured variability relating to seismicity (structural scope) and cost variables relating to the local regional factors. To extend out the cost estimates to a national level, these have been approximated by allocating each similar cost region to one of the six previously estimated towns and indicated in Table 16.

High level advice was provided by a Beca Quantity Surveyor for regional variables in costings across the 16 regions. These were then apportioned to the local Territorial Authorities within that region, acknowledging there are instances where there are multiple seismicity zones across one region, such as Otago.

We note there are additional uncertainties introduced into the cost estimates by this approximating approach.

Table 16 – Distribution of approximate cost locations based on one of the six towns from the original study

Territorial Authorities	Region	Seismic Risk Area (current)	Approximate cost equivalent to Wgtn
Ashburton District Council	Canterbury	Medium/High	Christchurch
Buller District Council	West Coast	Medium/High	Wellington
Carterton District Council	Wellington	High	Wellington
Central Hawke's Bay District Council	Hawke's Bay	High	Fielding
Central Otago District Council	Otago	Medium	Whanganui
Gisborne District Council	Gisborne	High	Wellington
Gore District Council	Southland	Medium	Christchurch
Grey District Council	West Coast	High	Wellington
Hamilton City Council	Waikato	Medium	Whanganui
Hastings District Council	Hawke's Bay	High	Fielding
Hauraki District Council	Waikato	Low/Medium	Whanganui
Horowhenua District Council	Manawatū-Whanganui	High	Fielding
Hurunui District Council	Canterbury	High	Christchurch
Hutt City Council	Wellington	High	Wellington
Invercargill City Council	Southland	Medium	Christchurch
Kapiti Coast District Council	Wellington	High	Wellington
Mackenzie District Council	Canterbury	Medium/High	Christchurch
Manawatu District Council	Manawatū-Whanganui	High	Fielding
Marlborough District Council	Marlborough	Medium/High	Christchurch
Masterton District Council	Wellington	High	Wellington

Territorial Authorities	Region	Seismic Risk Area (current)	Approximate cost equivalent to Wgtn
Matamata-Piako District Council	Waikato	Medium	Whanganui
Napier City Council	Hawke's Bay	High	Fielding
Nelson City Council	Nelson	Medium	Whanganui
New Plymouth District Council	Taranaki	Medium	Whanganui
Opotiki District Council	Bay of Plenty	High	Fielding
Palmerston North City Council	Manawatū-Whanganui	High	Fielding
Porirua City Council	Wellington	High	Wellington
Queenstown-Lakes District Council	Otago	High	Wellington
Rangitikei District Council	Manawatū-Whanganui	High	Fielding
Rotorua District Council	Bay of Plenty	Medium	Whanganui
Ruapehu District Council	Manawatū-Whanganui	Medium	Whanganui
Selwyn District Council	Canterbury	High	Christchurch
South Waikato District Council	Waikato	Medium	Whanganui
South Wairarapa District Council	Wellington	High	Wellington
Southland District Council	Southland	Medium/High	Christchurch
Stratford District Council	Taranaki	Medium	Whanganui
Tararua District Council	Manawatū-Whanganui	High	Fielding
Tasman District Council	Tasman	Medium/High	Christchurch
Taupo District Council	Waikato	Medium	Whanganui
Tauranga City Council	Bay of Plenty	Medium	Whanganui
Thames-Coromandel District Council	Waikato	Low/Medium	Whanganui
Timaru District Council	Canterbury	Medium	Christchurch
Upper Hutt City Council	Wellington	High	Wellington
Waimakariri District Council	Canterbury	High	Christchurch
Waipa District Council	Waikato	Medium	Whanganui
Wairoa District Council	Hawke's Bay	High	Fielding
Waitaki District Council	Otago	Medium/High	Christchurch
Waitomo District Council	Waikato	Medium	Whanganui
Western Bay of Plenty District Council	Bay of Plenty	Medium	Whanganui

Territorial Authorities	Region	Seismic Risk Area (current)	Approximate cost equivalent to Wgtn
Westland District Council	West Coast	High	Wellington
Whakatane District Council	Bay of Plenty	High	Fielding
Auckland City Council	Auckland	Low	Auckland
Wellington City Council	Wellington	High	Wellington
Christchurch City Council	Canterbury	High	Christchurch
Dunedin City Council	Otago	Low	Dunedin
Whanganui District Council	Manawatū-Whanganui	Medium	Whanganui

8 Fragility Assumptions

Fragility assumptions for:

- Status-Quo 34%*NBS:* as per Beca report 30 May 2025
- 'Doing nothing': as per Beca report 30 May 2025
- Targeted Retrofit currently kept same as 34%*NBS* fragility curves for all three aspects: people, downtime, property damage. This may not accurately represent or correctly interpret the expected performance of the targeted retrofit approach for each category. However, we would like to note that this aspect should be discussed further with the different technical groups before finalisation.

9 APoE Results

Table 17 – APoE results – National

Nighttime Event	National	POLICY OPTION Reduced inventory as per policy option and specified targeted retrofit							BENCHMARK: Reduced inventory as per options and retrofit kept at 34%*NBS*						% change in BCR
	APoE	Nº of buildings	Nº of retrofitted buildings	Benefit - Avoided loss relative to the unstrengthened case	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened	No. of retrofitted buildings	Benefit – Avoided loss	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened	
Status quo, 34%*NBS* retrofit	1:2500	5212	5212	$ 193 ,100 M	$ 10 ,900 M	18	$ 681 ,600 M	$ 488 ,500 M	5212	$ 193 ,100 M	$ 10 ,900 M	18	$ 681 ,600 M	$ 488 ,500 M	100%
	1:1000	5212	5212	$ 193 ,300 M	$ 10 ,900 M	18	$ 560 ,700 M	$ 367 ,400 M	5212	$ 193 ,300 M	$ 10 ,900 M	18	$ 560 ,700 M	$ 367 ,400 M	100%
	1:500	5212	5212	$ 181 ,800 M	$ 10 ,900 M	17	$ 455 ,700 M	$ 273 ,900 M	5212	$ 181 ,800 M	$ 10 ,900 M	17	$ 455 ,700 M	$ 273 ,900 M	100%
Option 1	1:2500	5212	5212	$ 193 ,200 M	$ 8 ,500 M	23	$ 681 ,600 M	$ 488 ,400 M	5212	$ 193 ,200 M	$ 8 ,500 M	23	$ 681 ,600 M	$ 488 ,400 M	100%
	1:1000	5212	5212	$ 193 ,500 M	$ 8 ,500 M	23	$ 560 ,700 M	$ 367 ,200 M	5212	$ 193 ,500 M	$ 8 ,500 M	23	$ 560 ,700 M	$ 367 ,200 M	100%
	1:500	5212	5212	$ 182 ,000 M	$ 8 ,500 M	22	$ 455 ,700 M	$ 273 ,700 M	5212	$ 182 ,000 M	$ 8 ,500 M	22	$ 455 ,700 M	$ 273 ,700 M	100%
Option 3.1 New seismic zones 1-2 storey URM in	1:2500	5212	1455	$ 68 ,300 M	$ 2 ,500 M	27	$ 681 ,600 M	$ 613 ,300 M	1455	$ 67 ,300 M	$ 4 ,400 M	15	$ 681 ,600 M	$ 614 ,300 M	174%
	1:1000	5212	1455	$ 75 ,500 M	$ 2 ,500 M	30	$ 560 ,700 M	$ 485 ,200 M	1455	$ 74 ,700 M	$ 4 ,400 M	17	$ 560 ,700 M	$ 486 ,000 M	173%
	1:500	5212	1455	$ 75 ,800 M	$ 2 ,500 M	30	$ 455 ,700 M	$ 379 ,900 M	1455	$ 75 ,100 M	$ 4 ,400 M	17	$ 455 ,700 M	$ 380 ,600 M	173%
Option 3.1B As 3.1 above but with new exposure zone	1:2500	5212	715	$ 56,959 M	$ 2 ,259 M	25	$ 681 ,600 M	$ 624, 600 M	715	$ 56, 000 M	$ 3, 325 M	16	$ 681 ,600 M	$ 625, 000 M	156%
	1:1000	5212	715	$ 60, 712 M	$ 2 ,259 M	26	$ 560 ,700 M	$ 500, 000 M	715	$ 60, 000 M	$ 3, 325 M	18	$ 560 ,700 M	$ 500, 600 M	144%
	1:500	5212	715	$ 58, 824 M	$ 2 ,259 M	26	$ 455 ,700 M	$ 396, 000 M	715	$ 58, 000 M	$ 3, 325 M	17	$ 455 ,700 M	$ 397, 400 M	152%
Option 3.2 New seismic zones 1-2 storey URM out	1:2500	5212	297	$ 44 ,700 M	$ 1 ,900 M	23	$ 681 ,600 M	$ 636 ,900 M	297	$ 43 ,900 M	$ 2 ,400 M	18	$ 681 ,600 M	$ 637 ,600 M	128%
	1:1000	5212	297	$ 45 ,900 M	$ 1 ,900 M	24	$ 560 ,700 M	$ 514 ,800 M	297	$ 45 ,300 M	$ 2 ,400 M	19	$ 560 ,700 M	$ 515 ,400 M	128%
	1:500	5212	297	$ 43 ,200 M	$ 1 ,900 M	23	$ 455 ,700 M	$ 412 ,500 M	297	$ 42 ,600 M	$ 2 ,400 M	18	$ 455 ,700 M	$ 413 ,100 M	128%
Option 3.3 2017 seismic zones 1-2 storey URM in	1:2500	5212	1323	$ 60 ,700 M	$ 2 ,300 M	26	$ 681 ,600 M	$ 620 ,800 M	1323	$ 59 ,700 M	$ 4 ,000 M	15	$ 681 ,600 M	$ 621 ,800 M	178%
	1:1000	5212	1323	$ 68 ,400 M	$ 2 ,300 M	30	$ 560 ,700 M	$ 492 ,300 M	1323	$ 67 ,600 M	$ 4 ,000 M	17	$ 560 ,700 M	$ 493 ,100 M	177%
	1:500	5212	1323	$ 70 ,000 M	$ 2 ,300 M	31	$ 455 ,700 M	$ 385 ,700 M	1323	$ 69 ,200 M	$ 4 ,000 M	17	$ 455 ,700 M	$ 386 ,500 M	177%
Option 3.4 2017 seismic zones 1-2 storey URM out	1:2500	5212	268	$ 41 ,900 M	$ 1 ,800 M	24	$ 681 ,600 M	$ 639 ,700 M	268	$ 41 ,200 M	$ 2 ,300 M	18	$ 681 ,600 M	$ 640 ,400 M	129%
	1:1000	5212	268	$ 43 ,700 M	$ 1 ,800 M	24	$ 560 ,700 M	$ 517 ,000 M	268	$ 43 ,000 M	$ 2 ,300 M	19	$ 560 ,700 M	$ 517 ,700 M	129%
	1:500	5212	268	$ 41 ,500 M	$ 1 ,800 M	23	$ 455 ,700 M	$ 414 ,200 M	268	$ 41 ,000 M	$ 2 ,300 M	18	$ 455 ,700 M	$ 414 ,700 M	129%
Option 4 Doing nothing	1:2500	5212	0	0	0		$ 681 ,600 M	$ 681 ,600 M	0	0	0		$ 681 ,600 M	$ 681 ,600 M	
	1:1000	5212	0	0	0		$ 560 ,700 M	$ 560 ,700 M	0	0	0		$ 560 ,700 M	$ 560 ,700 M	
	1:500	5212	0	0	0		$ 455 ,700 M	$ 455 ,700 M	0	0	0		$ 455 ,700 M	$ 455 ,700 M	

Table 18 – Impact on Life Safety Policy option vs Status quo

	National	Number of Buildings	Number of Buildings retrofitted	Impact on Life Safety under policy option vs Status-quo 34%			
	APoE			CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	5212	5212	1.00	1.00	1.00	1.00
	1:1000	5212	5212	1.00	1.00	1.00	1.00
	1:500	5212	5212	1.00	1.00	1.00	1.00
Option 1	1:2500	5212	5212	1.00	1.00	1.00	1.00
	1:1000	5212	5212	1.00	1.00	1.00	1.00
	1:500	5212	5212	1.00	1.00	1.00	1.00
Option 3.1 New Seismic Zones 1-2 storey URM inside scope	1:2500	5212	1455	1.27	1.32	1.28	1.29
	1:1000	5212	1455	1.31	1.39	1.34	1.34
	1:500	5212	1455	1.34	1.47	1.41	1.40
Option 3.1B As 3.1 above but with new exposure zone	1:2500	5212	715	1.28	1.43	1.37	1.37
	1:1000	5212	715	1.33	1.58	1.50	1.48
	1:500	5212	715	1.37	1.77	1.65	1.61
Option 3.2 New Seismic Zones 1-2 storey URM outside scope	1:2500	5212	297	1.29	1.53	1.45	1.44
	1:1000	5212	297	1.35	1.72	1.61	1.58
	1:500	5212	297	1.41	1.95	1.81	1.76
Option 3.3 2017 Seismic Zones 1-2 storey URM inside scope	1:2500	5212	1323	1.28	1.37	1.33	1.33
	1:1000	5212	1323	1.33	1.44	1.39	1.39
	1:500	5212	1323	1.37	1.52	1.46	1.45
Option 3.4 2017 Seismic Zones 1-2 storey URM outside scope	1:2500	5212	268	1.29	1.54	1.47	1.45
	1:1000	5212	268	1.35	1.73	1.63	1.60
	1:500	5212	268	1.42	1.97	1.82	1.78
Option 4 Doing nothing	1:2500	5212	0	1.41	1.69	1.60	1.61
	1:1000	5212	0	1.52	1.95	1.83	1.81
	1:500	5212	0	1.62	2.25	2.08	2.04

National – APoE Cost vs Benefit (life safety only)

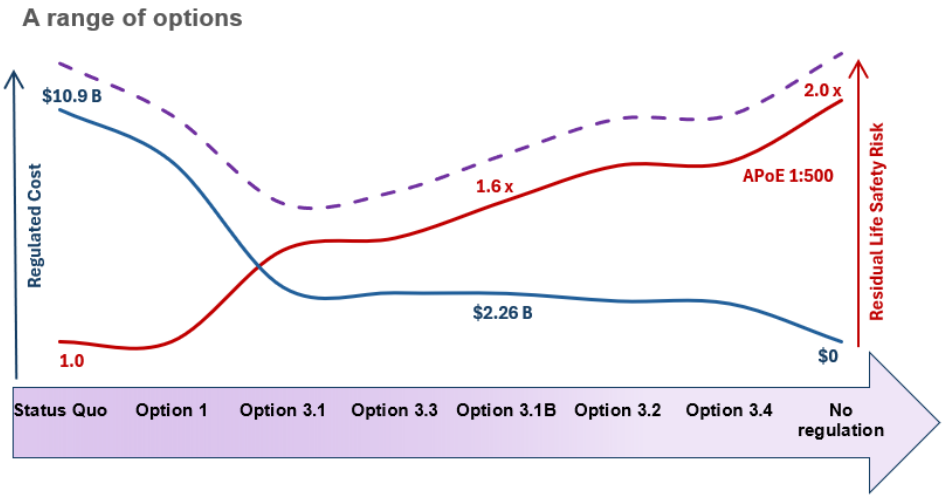


Figure 8: National APoE vs Retrofit Cost results for the various options

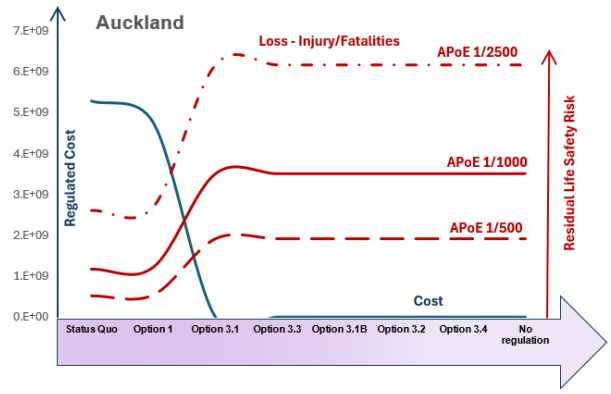


Figure 9: Auckland APoE vs Retrofit Cost results for the various options

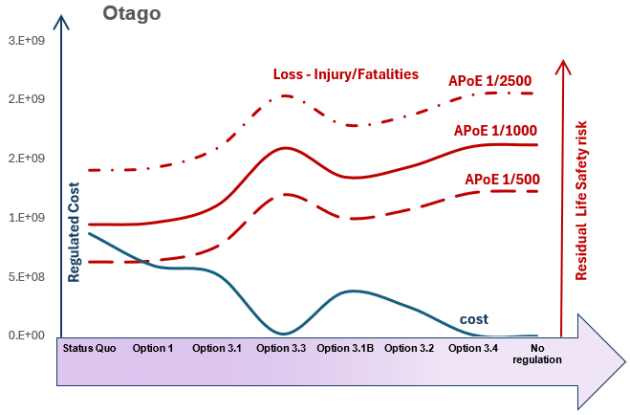


Figure 10: Otago APoE vs Retrofit Cost results for the various options

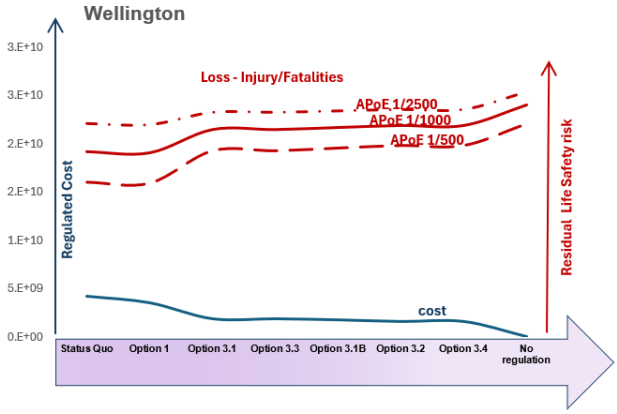


Figure 11: Wellington APoE vs Retrofit Cost results for the various options

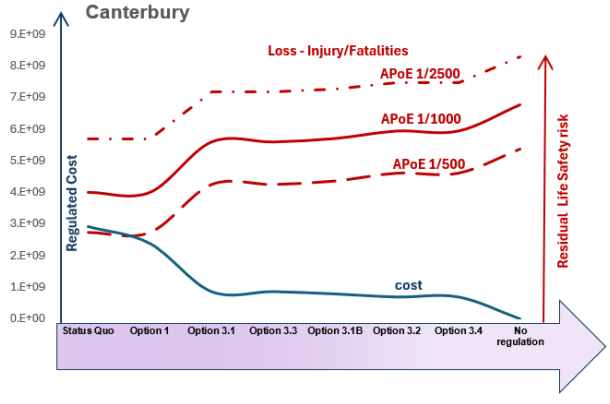


Figure 12: Canterbury APoE vs Retrofit Cost results for the various options

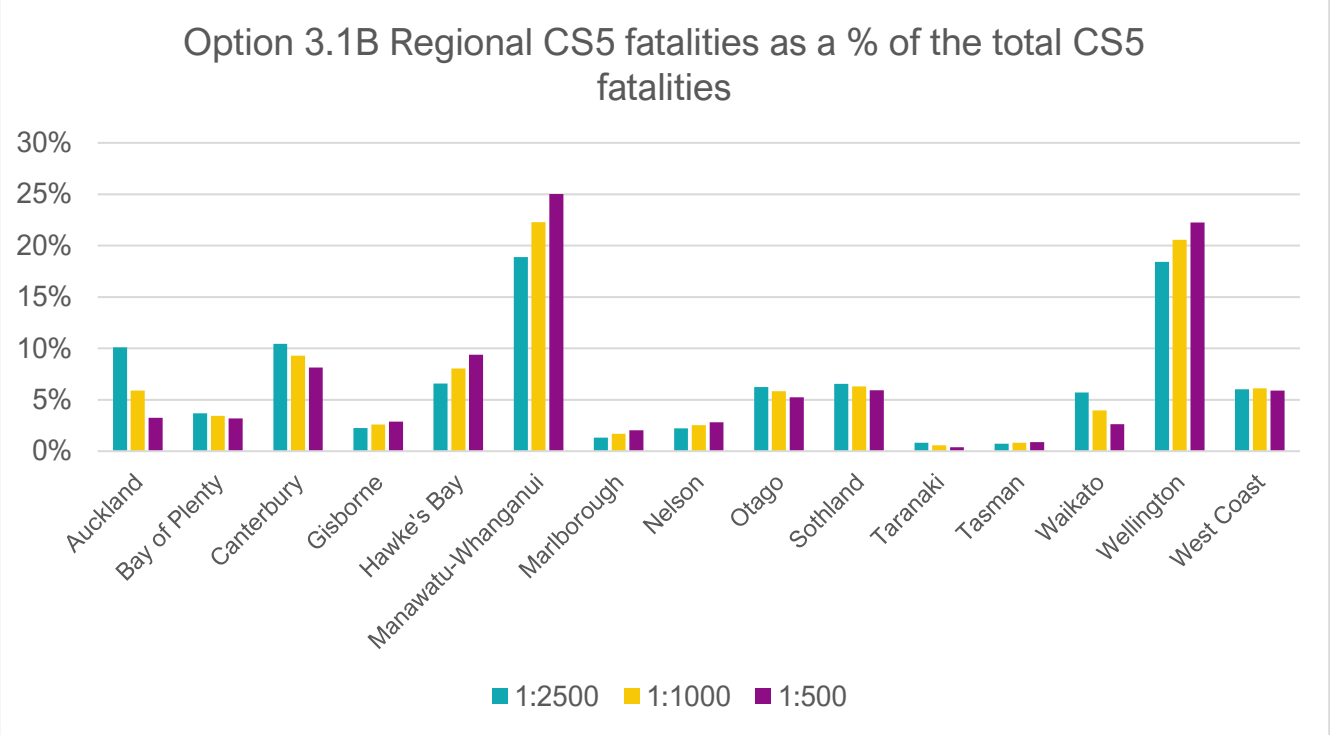


Figure 13: Option 3.1B showing the regional CS5 fatalities as a percent of the total fatalities.

As can be seen from the Figure 13, the Manawatu-Whanganui region represents the highest proportional rate of fatalities. Looking into the inventory of this region reveals there are currently 648 buildings on the EPB register with 566 (87%) of these designated as 'Low Exposure'. This region is relatively large and covers seven TAs generally in a high seismicity zone. Similarly, Wellington has 802 buildings on the EPB register, 599 (75%) of these are designated as 'Low Exposure' and is also in a high seismicity zone.

Manawatu-Whanganui also has seven larger GFA buildings with a total of 44,000m^2.

Table 19 – Impact on Life Safety

	APoE	Status Quo	Option1	Option 3.1	Option 3.3	Option 3.1B	Option 3.2	Option 3.4	Doing nothing
Cost		$10.9 *B*	$8.45 *B*	$ 2.55 *B*	$ 2.29 *B*	$ 2.26 *B*	$ 1.9 *B*	$ 1.78 *B*	0
Residual Life Safety	1:2500	1.00	1.00	1.29	1.33	1.37	1.44	1.45	1.61
	1:1000	1.00	1.00	1.34	1.39	1.48	1.58	1.60	1.81
	1:500	1.00	1.00	1.40	1.45	1.61	1.76	1.78	2.04
Nº of Retrofitted buildings		5212	5212	1455	1323	715	297	268	0

Table 20 – Preferred Policy Option – ApoE Approach – Auckland

Auckland		Auckland				Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 43 ,600 M	$ 70,800 M	$ 29,800 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 26 ,600 M	$ 37,500 M	$ 13,600 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 14 ,600 M	$ 18,800 M	$ 6,900 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 43 ,500 M	$ 70,800 M	$ 29,600 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 26 ,500 M	$ 37,500 M	$ 13,300 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 14 ,600 M	$ 18,800 M	$ 6,600 M		1:500	1.0	1.0	1.0	1.0
Option 3.1	1:2500	0	$ 70,800 M	$ 70,800 M		1:2500	2.4	3.7	3.4	3.5
New seismic zones	1:1000	0	$ 37,500 M	$ 37,500 M		1:1000	3.0	5.2	4.9	4.9
1-2 storey URM inside of scope	1:500	0	$ 18,800 M	$ 18,800 M		1:500	3.7	6.8	6.9	6.8
Option 3.1B	1:2500	0	$ 70,800 M	$ 70,800 M		1:2500	2.4	3.7	3.4	3.5
as above new exposure	1:1000	0	$ 37,500 M	$ 37,500 M		1:1000	3.0	5.2	4.9	4.9
	1:500	0	$ 18,800 M	$ 18,800 M		1:500	3.7	6.8	6.9	6.8
Option 3.2	1:2500	0	$ 70,800 M	$ 70,800 M		1:2500	2.4	3.7	3.4	3.5
New seismic zones	1:1000	0	$ 37,500 M	$ 37,500 M		1:1000	3.0	5.2	4.9	4.9
1-2 storey URM out of scope	1:500	0	$ 18,800 M	$ 18,800 M		1:500	3.7	6.8	6.9	6.8
Option 3.3	1:2500	0	$ 70,800 M	$ 70,800 M		1:2500	2.4	3.7	3.4	3.5
2017 seismic zones	1:1000	0	$ 37,500 M	$ 37,500 M		1:1000	3.0	5.2	4.9	4.9
1-2 storey URM inside of scope	1:500	0	$ 18,800 M	$ 18,800 M		1:500	3.7	6.8	6.9	6.8
Option 3.4	1:2500	0	$ 70,800 M	$ 70,800 M		1:2500	2.4	3.7	3.4	3.5
2017 seismic zones	1:1000	0	$ 37,500 M	$ 37,500 M		1:1000	3.0	5.2	4.9	4.9
1-2 storey URM out of scope	1:500	0	$ 18,800 M	$ 18,800 M		1:500	3.7	6.8	6.9	6.8
Option 4	1:2500	0	$ 70,800 M	$ 70,800 M		1:2500	2.4	3.7	3.4	3.5
Doing nothing	1:1000	0	$ 37,500 M	$ 37,500 M		1:1000	3.0	5.2	4.9	4.9
	1:500	0	$ 18,800 M	$ 18,800 M		1:500	3.7	6.8	6.9	6.8

Table 21 – Preferred Policy Option – ApoE Approach – Bay of Plenty

Bay of Plenty		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 9 ,340 M	$ 390 M	24	$ 28,000 M	$ 19,100 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 9 ,500 M	$ 390 M	24	$ 22,300 M	$ 13,200 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 8 ,600 M	$ 390 M	22	$ 17,200 M	$ 9,100 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 9 ,400 M	$ 280 M	33	$ 28,000 M	$ 18,900 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 9 ,500 M	$ 280 M	34	$ 22,300 M	$ 13,100 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 8 ,600 M	$ 280 M	30	$ 17,200 M	$ 9,000 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 4 ,400 M	$ 130 M	35	$ 28,000 M	$ 23,700 M		1:2500	1.2	1.4	1.3	1.3
	1:1000	$ 4 ,500 M	$ 130 M	35	$ 22,300 M	$ 18,000 M		1:1000	1.3	1.6	1.5	1.4
	1:500	$ 4 ,100 M	$ 130 M	32	$ 17,200 M	$ 13,300 M		1:500	1.4	1.8	1.7	1.6
Option 3.1B as above new exposure	1:2500	$ 3 ,900 M	$ 120 M	33	$ 28,000 M	$ 24,200 M		1:2500	1.2	1.5	1.4	1.4
	1:1000	$ 3 ,900 M	$ 120 M	33	$ 22,300 M	$ 18,600 M		1:1000	1.3	1.9	1.7	1.6
	1:500	$ 3 ,400 M	$ 120 M	29	$ 17,200 M	$ 13,900 M		1:500	1.4	2.2	2.0	1.9
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 3 ,300 M	$ 100 M	31	$ 28,000 M	$ 24,900 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	$ 3 ,100 M	$ 100 M	30	$ 22,300 M	$ 19,400 M		1:1000	1.3	2.1	1.8	1.8
	1:500	$ 2 ,600 M	$ 100 M	25	$ 17,200 M	$ 14,800 M		1:500	1.5	2.5	2.2	2.2
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 4 ,400 M	$ 130 M	35	$ 28,000 M	$ 23,700 M		1:2500	1.2	1.4	1.3	1.3
	1:1000	$ 4 ,500 M	$ 130 M	35	$ 22,300 M	$ 18,000 M		1:1000	1.3	1.6	1.5	1.4
	1:500	$ 4 ,100 M	$ 130 M	32	$ 17,200 M	$ 13,300 M		1:500	1.4	1.8	1.7	1.6
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 3 ,300 M	$ 100 M	31	$ 28,000 M	$ 24,900 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	$ 3 ,100 M	$ 100 M	30	$ 22,300 M	$ 19,400 M		1:1000	1.3	2.1	1.8	1.8
	1:500	$ 2 ,600 M	$ 100 M	25	$ 17,200 M	$ 14,800 M		1:500	1.5	2.5	2.2	2.2
Option 4 Doing nothing	1:2500	0	0	0	$ 28,000 M	$ 28,000 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	0	0	0	$ 22,300 M	$ 22,300 M		1:1000	1.3	2.1	1.8	1.8
	1:500	0	0	0	$ 17,200 M	$ 17,200 M		1:500	1.5	2.5	2.2	2.2

Table 22 – Preferred Policy Option – ApoE Approach – Canterbury

Canterbury		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 36 ,310 M	$ 1,460 M	25	$ 107,100 M	$ 72,300 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 37 ,400 M	$ 1,460 M	26	$ 85,900 M	$ 49,900 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 34 ,200 M	$ 1,460 M	23	$ 66,600 M	$ 33,900 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 36 ,300 M	$ 1,190 M	30	$ 107,100 M	$ 72,000 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 37 ,400 M	$ 1,190 M	31	$ 85,900 M	$ 49,700 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 34 ,200 M	$ 1,190 M	29	$ 66,600 M	$ 33,600 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 13 ,800 M	$ 430 M	32	$ 107,100 M	$ 93,800 M		1:2500	1.2	1.4	1.3	1.3
	1:1000	$ 13 ,800 M	$ 430 M	32	$ 85,900 M	$ 72,500 M		1:1000	1.3	1.7	1.5	1.5
	1:500	$ 12 ,400 M	$ 430 M	29	$ 66,600 M	$ 54,600 M		1:500	1.4	1.9	1.8	1.7
Option 3.1B as above new exposure	1:2500	$ 12 ,700 M	$ 400 M	32	$ 107,100 M	$ 94,900 M		1:2500	1.2	1.5	1.4	1.4
	1:1000	$ 12 ,500 M	$ 400 M	32	$ 85,900 M	$ 73,800 M		1:1000	1.3	1.8	1.6	1.6
	1:500	$ 11 ,000 M	$ 400 M	28	$ 66,600 M	$ 56,000 M		1:500	1.4	2.1	1.9	1.9
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 10 ,400 M	$ 350 M	30	$ 107,100 M	$ 97,100 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	$ 9 ,500 M	$ 350 M	27	$ 85,900 M	$ 76,700 M		1:1000	1.3	2.0	1.8	1.8
	1:500	$ 7 ,800 M	$ 350 M	23	$ 66,600 M	$ 59,100 M		1:500	1.5	2.4	2.2	2.2
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 13 ,800 M	$ 430 M	32	$ 107,100 M	$ 93,800 M		1:2500	1.2	1.4	1.3	1.3
	1:1000	$ 13 ,800 M	$ 430 M	32	$ 85,900 M	$ 72,500 M		1:1000	1.3	1.7	1.5	1.5
	1:500	$ 12 ,400 M	$ 430 M	29	$ 66,600 M	$ 54,600 M		1:500	1.4	1.9	1.8	1.7
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 10 ,400 M	$ 350 M	30	$ 107,100 M	$ 97,100 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	$ 9 ,500 M	$ 350 M	28	$ 85,900 M	$ 76,700 M		1:1000	1.3	2.0	1.8	1.8
	1:500	$ 7 ,800 M	$ 350 M	23	$ 66,600 M	$ 59,100 M		1:500	1.5	2.4	2.2	2.2
Option 4 Doing nothing	1:2500	0	0	0	$ 107,100 M	$ 107,100 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	0	0	0	$ 85,900 M	$ 85,900 M		1:1000	1.3	2.0	1.8	1.8
	1:500	0	0	0	$ 66,600 M	$ 66,600 M		1:500	1.5	2.4	2.2	2.2

Table 23 – Preferred Policy Option – ApoE Approach – Gisborne

Gisborne		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 1 ,260 M	$ 110 M	12	$ 6,900 M	$ 5,700 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 1 ,700 M	$ 110 M	16	$ 6,300 M	$ 4,700 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 1 ,900 M	$ 110 M	18	$ 5,600 M	$ 3,800 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 1 ,300 M	$ 80 M	16	$ 6,900 M	$ 5,700 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 1 ,700 M	$ 80 M	22	$ 6,300 M	$ 4,700 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 1 ,900 M	$ 80 M	25	$ 5,600 M	$ 3,700 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 1 ,000 M	$ 50 M	18	$ 6,900 M	$ 6,000 M		1:2500	1.0	1.1	1.0	1.0
	1:1000	$ 1 ,300 M	$ 50 M	24	$ 6,300 M	$ 5,100 M		1:1000	1.0	1.1	1.1	1.1
	1:500	$ 1 ,500 M	$ 50 M	27	$ 5,600 M	$ 4,100 M		1:500	1.0	1.1	1.1	1.1
Option 3.1B as above new exposure	1:2500	$ 700 M	$ 40 M	15	$ 6,900 M	$ 6,200 M		1:2500	1.0	1.2	1.2	1.1
	1:1000	$ 800 M	$ 40 M	19	$ 6,300 M	$ 5,500 M		1:1000	1.0	1.4	1.3	1.2
	1:500	$ 900 M	$ 40 M	20	$ 5,600 M	$ 4,700 M		1:500	1.1	1.6	1.4	1.4
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 700 M	$ 40 M	15	$ 6,900 M	$ 6,200 M		1:2500	1.0	1.2	1.2	1.1
	1:1000	$ 800 M	$ 40 M	19	$ 6,300 M	$ 5,500 M		1:1000	1.0	1.4	1.3	1.2
	1:500	$ 900 M	$ 40 M	20	$ 5,600 M	$ 4,700 M		1:500	1.1	1.6	1.4	1.4
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 1 ,000 M	$ 50 M	18	$ 6,900 M	$ 6,000 M		1:2500	1.0	1.1	1.0	1.0
	1:1000	$ 1 ,300 M	$ 50 M	24	$ 6,300 M	$ 5,100 M		1:1000	1.0	1.1	1.1	1.1
	1:500	$ 1 ,500 M	$ 50 M	27	$ 5,600 M	$ 4,100 M		1:500	1.0	1.1	1.1	1.1
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 700 M	$ 40 M	15	$ 6,900 M	$ 6,200 M		1:2500	1.0	1.2	1.2	1.1
	1:1000	$ 800 M	$ 40 M	19	$ 6,300 M	$ 5,500 M		1:1000	1.0	1.4	1.3	1.2
	1:500	$ 900 M	$ 40 M	20	$ 5,600 M	$ 4,700 M		1:500	1.1	1.6	1.4	1.4
Option 4 Doing nothing	1:2500	0	0	0	$ 6,900 M	$ 6,900 M		1:2500	1.0	1.2	1.2	1.1
	1:1000	0	0	0	$ 6,300 M	$ 6,300 M		1:1000	1.0	1.4	1.3	1.2
	1:500	0	0	0	$ 5,600 M	$ 5,600 M		1:500	1.1	1.6	1.4	1.4

Table 24 – Preferred Policy Option – ApoE Approach – Hawkes Bay

Hawkes Bay		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 5 ,630 M	$ 320 M	17	$ 34,900 M	$ 29,600 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 7 ,900 M	$ 320 M	24	$ 32,300 M	$ 24,800 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 9 ,300 M	$ 320 M	29	$ 28,900 M	$ 20,000 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 5 ,700 M	$ 170 M	33	$ 34,900 M	$ 29,400 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 7 ,900 M	$ 170 M	46	$ 32,300 M	$ 24,600 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 9 ,300 M	$ 170 M	54	$ 28,900 M	$ 19,800 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 1 ,600 M	$ 70 M	23	$ 34,900 M	$ 33,400 M		1:2500	1.1	1.1	1.1	1.1
	1:1000	$ 2 ,500 M	$ 70 M	37	$ 32,300 M	$ 29,900 M		1:1000	1.1	1.2	1.2	1.1
	1:500	$ 3 ,200 M	$ 70 M	47	$ 28,900 M	$ 25,800 M		1:500	1.2	1.3	1.2	1.2
Option 3.1B as above new exposure	1:2500	$ 700 M	$ 40 M	18	$ 34,900 M	$ 34,200 M		1:2500	1.1	1.3	1.2	1.2
	1:1000	$ 1 ,100 M	$ 40 M	28	$ 32,300 M	$ 31,200 M		1:1000	1.1	1.5	1.4	1.3
	1:500	$ 1 ,400 M	$ 40 M	35	$ 28,900 M	$ 27,500 M		1:500	1.2	1.8	1.6	1.5
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 500 M	$ 30 M	19	$ 34,900 M	$ 34,400 M		1:2500	1.1	1.3	1.2	1.2
	1:1000	$ 800 M	$ 30 M	26	$ 32,300 M	$ 31,600 M		1:1000	1.1	1.5	1.4	1.4
	1:500	$ 900 M	$ 30 M	30	$ 28,900 M	$ 28,100 M		1:500	1.2	1.9	1.7	1.6
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 1 ,600 M	$ 70 M	23	$ 34,900 M	$ 33,400 M		1:2500	1.1	1.1	1.1	1.1
	1:1000	$ 2 ,500 M	$ 70 M	37	$ 32,300 M	$ 29,900 M		1:1000	1.1	1.2	1.2	1.1
	1:500	$ 3 ,200 M	$ 70 M	47	$ 28,900 M	$ 25,800 M		1:500	1.2	1.3	1.2	1.2
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 500 M	$ 30 M	19	$ 34,900 M	$ 34,400 M		1:2500	1.1	1.3	1.2	1.2
	1:1000	$ 800 M	$ 30 M	26	$ 32,300 M	$ 31,600 M		1:1000	1.1	1.5	1.4	1.4
	1:500	$ 900 M	$ 30 M	30	$ 28,900 M	$ 28,100 M		1:500	1.2	1.9	1.7	1.6
Option 4 Doing nothing	1:2500	0	0	0	$ 34,900 M	$ 34,900 M		1:2500	1.1	1.3	1.2	1.2
	1:1000	0	0	0	$ 32,300 M	$ 32,300 M		1:1000	1.1	1.5	1.4	1.4
	1:500	0	0	0	$ 28,900 M	$ 28,900 M		1:500	1.2	1.9	1.7	1.6

Table 25 – Preferred Policy Option – ApoE Approach – Manawatu-Whanganui

Manawatu-Whanganui		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 12 ,780 M	$ 1,090 M	12	$ 89,700 M	$ 78,000 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 18 ,100 M	$ 1,090 M	17	$ 83,300 M	$ 66,400 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 21 ,800 M	$ 1,090 M	20	$ 74,900 M	$ 54,100 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 12 ,900 M	$ 660 M	19	$ 89,700 M	$ 77,500 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 18 ,100 M	$ 660 M	27	$ 83,300 M	$ 65,900 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 21 ,900 M	$ 660 M	33	$ 74,900 M	$ 53,600 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 4 ,000 M	$ 170 M	23	$ 89,700 M	$ 85,900 M		1:2500	1.1	1.2	1.1	1.1
	1:1000	$ 5 ,900 M	$ 170 M	35	$ 83,300 M	$ 77,600 M		1:1000	1.1	1.3	1.2	1.2
	1:500	$ 7 ,400 M	$ 170 M	43	$ 74,900 M	$ 67,700 M		1:500	1.1	1.4	1.3	1.3
Option 3.1B as above new exposure	1:2500	$ 2 ,900 M	$ 130 M	22	$ 89,700 M	$ 87,000 M		1:2500	1.0	1.3	1.2	1.2
	1:1000	$ 4 ,000 M	$ 130 M	31	$ 83,300 M	$ 79,500 M		1:1000	1.1	1.4	1.3	1.3
	1:500	$ 4 ,800 M	$ 130 M	37	$ 74,900 M	$ 70,200 M		1:500	1.2	1.7	1.5	1.5
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 1 ,800 M	$ 90 M	21	$ 89,700 M	$ 88,000 M		1:2500	1.0	1.3	1.3	1.2
	1:1000	$ 2 ,400 M	$ 90 M	28	$ 83,300 M	$ 81,000 M		1:1000	1.1	1.5	1.4	1.4
	1:500	$ 2 ,800 M	$ 90 M	33	$ 74,900 M	$ 72,100 M		1:500	1.2	1.8	1.7	1.6
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 4 ,000 M	$ 170 M	23	$ 89,700 M	$ 85,900 M		1:2500	1.1	1.2	1.1	1.1
	1:1000	$ 5 ,900 M	$ 170 M	35	$ 83,300 M	$ 77,600 M		1:1000	1.1	1.3	1.2	1.2
	1:500	$ 7 ,400 M	$ 170 M	43	$ 74,900 M	$ 67,700 M		1:500	1.1	1.4	1.3	1.3
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 1 ,800 M	$ 90 M	21	$ 89,700 M	$ 88,000 M		1:2500	1.0	1.3	1.3	1.2
	1:1000	$ 2 ,400 M	$ 90 M	28	$ 83,300 M	$ 81,000 M		1:1000	1.1	1.5	1.4	1.4
	1:500	$ 2 ,800 M	$ 90 M	33	$ 74,900 M	$ 72,100 M		1:500	1.2	1.8	1.7	1.6
Option 4 Doing nothing	1:2500	0	0	0	$ 89,700 M	$ 89,700 M		1:2500	1.0	1.3	1.3	1.2
	1:1000	0	0	0	$ 83,300 M	$ 83,300 M		1:1000	1.1	1.5	1.4	1.4
	1:500	0	0	0	$ 74,900 M	$ 74,900 M		1:500	1.2	1.8	1.7	1.6

Table 26 – Preferred Policy Option – ApoE Approach – Marlborough

Marlborough		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 350 M	$ 50 M	7	$ 4,500 M	$ 4,200 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 600 M	$ 50 M	12	$ 4,300 M	$ 3,800 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 900 M	$ 50 M	17	$ 4,000 M	$ 3,200 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 300 M	$ 20 M	20	$ 4,500 M	$ 4,200 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 600 M	$ 20 M	34	$ 4,300 M	$ 3,700 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 900 M	$ 20 M	48	$ 4,000 M	$ 3,200 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 200 M	$ 10 M	24	$ 4,500 M	$ 4,300 M		1:2500	1.1	1.1	1.1	1.1
	1:1000	$ 400 M	$ 10 M	46	$ 4,300 M	$ 4,000 M		1:1000	1.1	1.1	1.1	1.1
	1:500	$ 500 M	$ 10 M	67	$ 4,000 M	$ 3,500 M		1:500	1.1	1.2	1.2	1.2
Option 3.1B as above new exposure	1:2500	$ 13 M	0	0	$ 4,500 M	$ 4,500 M		1:2500	1.0	1.2	1.2	1.2
	1:1000	$ 19 M	0	0	$ 4,300 M	$ 4,300 M		1:1000	1.1	1.5	1.4	1.3
	1:500	$ 22 M	0	0	$ 4,000 M	$ 4,000 M		1:500	1.1	1.8	1.6	1.6
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 13 M	0	0	$ 4,500 M	$ 4,500 M		1:2500	1.0	1.2	1.2	1.2
	1:1000	$ 19 M	0	0	$ 4,300 M	$ 4,300 M		1:1000	1.1	1.5	1.4	1.3
	1:500	$ 22 M	0	0	$ 4,000 M	$ 4,000 M		1:500	1.1	1.8	1.6	1.6
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 200 M	$ 10 M	24	$ 4,500 M	$ 4,300 M		1:2500	1.1	1.1	1.1	1.1
	1:1000	$ 400 M	$ 10 M	46	$ 4,300 M	$ 4,000 M		1:1000	1.1	1.1	1.1	1.1
	1:500	$ 500 M	$ 10 M	67	$ 4,000 M	$ 3,500 M		1:500	1.1	1.2	1.2	1.2
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 13 M	0	0	$ 4,500 M	$ 4,500 M		1:2500	1.0	1.2	1.2	1.2
	1:1000	$ 19 M	0	0	$ 4,300 M	$ 4,300 M		1:1000	1.1	1.5	1.4	1.3
	1:500	$ 22 M	0	0	$ 4,000 M	$ 4,000 M		1:500	1.1	1.8	1.6	1.6
Option 4 Doing nothing	1:2500	0	0	0	$ 4,500 M	$ 4,500 M		1:2500	1.0	1.2	1.2	1.2
	1:1000	0	0	0	$ 4,300 M	$ 4,300 M		1:1000	1.1	1.5	1.4	1.3
	1:500	0	0	0	$ 4,000 M	$ 4,000 M		1:500	1.1	1.8	1.6	1.6

Table 27 – Preferred Policy Option – ApoE Approach – Nelson

Nelson		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 1 ,940 M	$ 90 M	21	$ 8,600 M	$ 6,800 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 2 ,400 M	$ 90 M	26	$ 7,600 M	$ 5,300 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 2 ,600 M	$ 90 M	28	$ 6,500 M	$ 4,000 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 1 ,900 M	$ 60 M	30	$ 8,600 M	$ 6,700 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 2 ,400 M	$ 60 M	37	$ 7,600 M	$ 5,200 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 2 ,600 M	$ 60 M	40	$ 6,500 M	$ 4,000 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 1 ,000 M	$ 20 M	46	$ 8,600 M	$ 7,600 M		1:2500	1.1	1.1	1.1	1.1
	1:1000	$ 1 ,300 M	$ 20 M	61	$ 7,600 M	$ 6,300 M		1:1000	1.2	1.2	1.2	1.2
	1:500	$ 1 ,500 M	$ 20 M	67	$ 6,500 M	$ 5,100 M		1:500	1.2	1.2	1.2	1.2
Option 3.1B as above new exposure	1:2500	$ 500 M	$ 10 M	32	$ 8,600 M	$ 8,100 M		1:2500	1.1	1.5	1.4	1.3
	1:1000	$ 600 M	$ 10 M	38	$ 7,600 M	$ 7,000 M		1:1000	1.2	1.8	1.6	1.6
	1:500	$ 600 M	$ 10 M	39	$ 6,500 M	$ 6,000 M		1:500	1.3	2.1	1.9	1.8
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 400 M	$ 10 M	28	$ 8,600 M	$ 8,300 M		1:2500	1.1	1.5	1.4	1.4
	1:1000	$ 400 M	$ 10 M	30	$ 7,600 M	$ 7,200 M		1:1000	1.2	1.9	1.7	1.7
	1:500	$ 400 M	$ 10 M	29	$ 6,500 M	$ 6,200 M		1:500	1.3	2.3	2.1	2.0
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 1 ,000 M	$ 20 M	46	$ 8,600 M	$ 7,600 M		1:2500	1.1	1.1	1.1	1.1
	1:1000	$ 1 ,300 M	$ 20 M	61	$ 7,600 M	$ 6,300 M		1:1000	1.2	1.2	1.2	1.2
	1:500	$ 1 ,500 M	$ 20 M	67	$ 6,500 M	$ 5,100 M		1:500	1.2	1.2	1.2	1.2
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 400 M	$ 10 M	28	$ 8,600 M	$ 8,300 M		1:2500	1.1	1.5	1.4	1.4
	1:1000	$ 400 M	$ 10 M	30	$ 7,600 M	$ 7,200 M		1:1000	1.2	1.9	1.7	1.7
	1:500	$ 400 M	$ 10 M	29	$ 6,500 M	$ 6,200 M		1:500	1.3	2.3	2.1	2.0
Option 4 Doing nothing	1:2500	0	0	0	$ 8,600 M	$ 8,600 M		1:2500	1.1	1.5	1.4	1.4
	1:1000	0	0	0	$ 7,600 M	$ 7,600 M		1:1000	1.2	1.9	1.7	1.7
	1:500	0	0	0	$ 6,500 M	$ 6,500 M		1:500	1.3	2.3	2.1	2.0

Table 28 – Preferred Policy Option – ApoE Approach – Otago

Otago		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 9 ,580 M	$ 430 M	22	$ 26,500 M	$ 17,400 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 9 ,300 M	$ 430 M	21	$ 20,000 M	$ 11,200 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 7 ,900 M	$ 430 M	18	$ 14,500 M	$ 7,000 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 9 ,600 M	$ 300 M	32	$ 26,500 M	$ 17,300 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 9 ,300 M	$ 300 M	31	$ 20,000 M	$ 11,100 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 7 ,900 M	$ 300 M	26	$ 14,500 M	$ 6,900 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 8 ,100 M	$ 260 M	31	$ 26,500 M	$ 18,700 M		1:2500	1.1	1.1	1.1	1.1
	1:1000	$ 7 ,800 M	$ 260 M	30	$ 20,000 M	$ 12,500 M		1:1000	1.1	1.2	1.1	1.1
	1:500	$ 6 ,600 M	$ 260 M	25	$ 14,500 M	$ 8,100 M		1:500	1.1	1.2	1.2	1.2
Option 3.1B as above new exposure	1:2500	$ 4 ,400 M	$ 190 M	24	$ 26,500 M	$ 22,300 M		1:2500	1.1	1.7	1.5	1.5
	1:1000	$ 3 ,800 M	$ 190 M	20	$ 20,000 M	$ 16,500 M		1:1000	1.2	2.1	1.9	1.8
	1:500	$ 2 ,800 M	$ 190 M	15	$ 14,500 M	$ 11,900 M		1:500	1.4	2.6	2.3	2.1
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 2 ,900 M	$ 120 M	23	$ 26,500 M	$ 23,800 M		1:2500	1.2	1.8	1.7	1.6
	1:1000	$ 2 ,400 M	$ 120 M	19	$ 20,000 M	$ 17,800 M		1:1000	1.3	2.3	2.1	2.0
	1:500	$ 1 ,700 M	$ 120 M	14	$ 14,500 M	$ 12,900 M		1:500	1.5	2.9	2.6	2.4
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 600 M	$ 10 M	65	$ 26,500 M	$ 25,900 M		1:2500	1.2	2.0	1.9	1.8
	1:1000	$ 700 M	$ 10 M	78	$ 20,000 M	$ 19,300 M		1:1000	1.4	2.4	2.2	2.1
	1:500	$ 800 M	$ 10 M	82	$ 14,500 M	$ 13,700 M		1:500	1.6	2.8	2.6	2.5
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 100 M	$ 10 M	21	$ 26,500 M	$ 26,400 M		1:2500	1.2	2.2	2.0	1.9
	1:1000	$ 100 M	$ 10 M	17	$ 20,000 M	$ 20,000 M		1:1000	1.4	2.7	2.4	2.3
	1:500	$ 100 M	$ 10 M	12	$ 14,500 M	$ 14,400 M		1:500	1.7	3.4	3.0	2.8
Option 4 Doing nothing	1:2500	0	0	0	$ 26,500 M	$ 26,500 M		1:2500	1.2	2.2	2.0	1.9
	1:1000	0	0	0	$ 20,000 M	$ 20,000 M		1:1000	1.4	2.7	2.4	2.3
	1:500	0	0	0	$ 14,500 M	$ 14,500 M		1:500	1.7	3.4	3.0	2.8

Table 29 – Preferred Policy Option – ApoE Approach – Palmerston North

Taranaki		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%						
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities	Quantities (Injuries)	Quantities CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 4 ,490 M	$ 210 M	21	$ 10,100 M	$ 5,900 M		1:2500	1.0	1.0	1.0	1.0	91	18
	1:1000	$ 3 ,800 M	$ 210 M	18	$ 7,000 M	$ 3,300 M		1:1000	1.0	1.0	1.0	1.0	45	7
	1:500	$ 2 ,900 M	$ 210 M	13	$ 4,500 M	$ 1,800 M		1:500	1.0	1.0	1.0	1.0	22	3
Option 1	1:2500	$ 4 ,500 M	$ 180 M	25	$ 10,100 M	$ 5,800 M		1:2500	1.0	1.0	1.0	1.0	91	18
	1:1000	$ 3 ,800 M	$ 180 M	21	$ 7,000 M	$ 3,300 M		1:1000	1.0	1.0	1.0	1.0	45	7
	1:500	$ 2 ,900 M	$ 180 M	16	$ 4,500 M	$ 1,800 M		1:500	1.0	1.0	1.0	1.0	22	3
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 2 ,500 M	$ 100 M	26	$ 10,100 M	$ 7,700 M		1:2500	1.2	1.9	1.7	1.7	126	32
	1:1000	$ 1 ,900 M	$ 100 M	20	$ 7,000 M	$ 5,100 M		1:1000	1.3	2.5	2.3	2.4	72	16
	1:500	$ 1 ,300 M	$ 100 M	13	$ 4,500 M	$ 3,300 M		1:500	1.5	3.2	3.0	3.2	40	8
Option 3.1B as above new exposure	1:2500	$ 2 ,500 M	$ 100 M	26	$ 10,100 M	$ 7,700 M		1:2500	1.2	1.9	1.7	1.7	126	32
	1:1000	$ 1 ,900 M	$ 100 M	20	$ 7,000 M	$ 5,100 M		1:1000	1.3	2.5	2.3	2.4	72	16
	1:500	$ 1 ,300 M	$ 100 M	13	$ 4,500 M	$ 3,300 M		1:500	1.5	3.2	3.0	3.2	40	8
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 2 ,500 M	$ 100 M	26	$ 10,100 M	$ 7,700 M		1:2500	1.2	1.9	1.7	1.7	126	32
	1:1000	$ 1 ,900 M	$ 100 M	20	$ 7,000 M	$ 5,100 M		1:1000	1.3	2.5	2.3	2.4	72	16
	1:500	$ 1 ,300 M	$ 100 M	13	$ 4,500 M	$ 3,300 M		1:500	1.5	3.2	3.0	3.2	40	8
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 2 ,500 M	$ 100 M	26	$ 10,100 M	$ 7,700 M		1:2500	1.2	1.9	1.7	1.7	126	32
	1:1000	$ 1 ,900 M	$ 100 M	20	$ 7,000 M	$ 5,100 M		1:1000	1.3	2.5	2.3	2.4	72	16
	1:500	$ 1 ,300 M	$ 100 M	13	$ 4,500 M	$ 3,300 M		1:500	1.5	3.2	3.0	3.2	40	8
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 2 ,500 M	$ 100 M	26	$ 10,100 M	$ 7,700 M		1:2500	1.2	1.9	1.7	1.7	126	32
	1:1000	$ 1 ,900 M	$ 100 M	20	$ 7,000 M	$ 5,100 M		1:1000	1.3	2.5	2.3	2.4	72	16
	1:500	$ 1 ,300 M	$ 100 M	13	$ 4,500 M	$ 3,300 M		1:500	1.5	3.2	3.0	3.2	40	8
Option 4 Doing nothing	1:2500	0	0	0	$ 10,100 M	$ 10,100 M		1:2500	1.2	1.9	1.7	1.7	126	32
	1:1000	0	0	0	$ 7,000 M	$ 7,000 M		1:1000	1.3	2.5	2.3	2.4	72	16
	1:500	0	0	0	$ 4,500 M	$ 4,500 M		1:500	1.5	3.2	3.0	3.2	40	8

Table 30 – Preferred Policy Option – ApoE Approach – Southland

Southland		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 12 ,230 M	$ 570 M	22	$ 41,800 M	$ 30,100 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 13 ,700 M	$ 570 M	24	$ 34,900 M	$ 21,800 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 13 ,400 M	$ 570 M	24	$ 28,300 M	$ 15,400 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 12 ,200 M	$ 310 M	39	$ 41,800 M	$ 29,900 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 13 ,700 M	$ 310 M	44	$ 34,900 M	$ 21,600 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 13 ,400 M	$ 310 M	43	$ 28,300 M	$ 15,200 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 4 ,600 M	$ 90 M	50	$ 41,800 M	$ 37,300 M		1:2500	1.1	1.4	1.3	1.3
	1:1000	$ 5 ,400 M	$ 90 M	59	$ 34,900 M	$ 29,600 M		1:1000	1.2	1.7	1.5	1.5
	1:500	$ 5 ,400 M	$ 90 M	60	$ 28,300 M	$ 22,900 M		1:500	1.3	1.9	1.8	1.7
Option 3.1B as above new exposure	1:2500	$ 3 ,800 M	$ 80 M	48	$ 41,800 M	$ 38,100 M		1:2500	1.1	1.5	1.4	1.4
	1:1000	$ 4 ,400 M	$ 80 M	48	$ 34,900 M	$ 30,600 M		1:1000	1.2	1.9	1.7	1.6
	1:500	$ 4 ,400 M	$ 80 M	48	$ 28,300 M	$ 23,900 M		1:500	1.3	2.2	2.0	1.9
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 1 ,100 M	$ 50 M	24	$ 41,800 M	$ 40,800 M		1:2500	1.2	1.9	1.7	1.6
	1:1000	$ 1 ,100 M	$ 50 M	24	$ 34,900 M	$ 33,900 M		1:1000	1.3	2.5	2.2	2.1
	1:500	$ 1 ,000 M	$ 50 M	21	$ 28,300 M	$ 27,300 M		1:500	1.5	3.0	2.7	2.5
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 4 ,600 M	$ 90 M	50	$ 41,800 M	$ 37,300 M		1:2500	1.1	1.4	1.3	1.3
	1:1000	$ 5 ,400 M	$ 90 M	59	$ 34,900 M	$ 29,600 M		1:1000	1.2	1.7	1.5	1.5
	1:500	$ 5 ,400 M	$ 90 M	60	$ 28,300 M	$ 22,900 M		1:500	1.3	1.9	1.8	1.7
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 1 ,100 M	$ 50 M	24	$ 41,800 M	$ 40,800 M		1:2500	1.2	1.9	1.7	1.6
	1:1000	$ 1 ,100 M	$ 50 M	24	$ 34,900 M	$ 33,900 M		1:1000	1.3	2.5	2.2	2.1
	1:500	$ 1 ,000 M	$ 50 M	21	$ 28,300 M	$ 27,300 M		1:500	1.5	3.0	2.7	2.5
Option 4 Doing nothing	1:2500	0	0	0	$ 41,800 M	$ 41,800 M		1:2500	1.2	1.9	1.7	1.6
	1:1000	0	0	0	$ 34,900 M	$ 34,900 M		1:1000	1.3	2.5	2.2	2.1
	1:500	0	0	0	$ 28,300 M	$ 28,300 M		1:500	1.5	3.0	2.7	2.5

Table 31 – Preferred Policy Option – ApoE Approach – Tasman

Tasman		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 910 M	$ 50 M	17	$ 4,300 M	$ 3,400 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 1 ,100 M	$ 50 M	21	$ 3,800 M	$ 2,700 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 1 ,200 M	$ 50 M	23	$ 3,300 M	$ 2,100 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$,900 M	$ 40 M	25	$ 4,300 M	$ 3,400 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 1 ,100 M	$ 40 M	32	$ 3,800 M	$ 2,700 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 1 ,200 M	$ 40 M	34	$ 3,300 M	$ 2,100 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 19 M	$ 0.45 M	42	$ 4,300 M	$ 4,300 M		1:2500	1.2	1.6	1.5	1.5
	1:1000	$ 30 M	$ 0.45 M	68	$ 3,800 M	$ 3,800 M		1:1000	1.3	2.1	1.8	1.8
	1:500	$ 38 M	$ 0.45 M	86	$ 3,300 M	$ 3,200 M		1:500	1.5	2.5	2.2	2.1
Option 3.1B as above new exposure	1:2500	0	0	0	$ 4,300 M	$ 4,300 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	0	0	0	$ 3,800 M	$ 3,800 M		1:1000	1.3	2.1	1.9	1.8
	1:500	0	0	0	$ 3,300 M	$ 3,300 M		1:500	1.5	2.6	2.3	2.2
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	0	0	0	$ 4,300 M	$ 4,300 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	0	0	0	$ 3,800 M	$ 3,800 M		1:1000	1.3	2.1	1.9	1.8
	1:500	0	0	0	$ 3,300 M	$ 3,300 M		1:500	1.5	2.6	2.3	2.2
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 19 M	$ 0.45 M	42	$ 4,300 M	$ 4,300 M		1:2500	1.2	1.6	1.5	1.5
	1:1000	$ 30 M	$ 0.45 M	68	$ 3,800 M	$ 3,800 M		1:1000	1.3	2.1	1.8	1.8
	1:500	$ 38 M	$ 0.45 M	86	$ 3,300 M	$ 3,200 M		1:500	1.5	2.5	2.2	2.1
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	0	0	0	$ 4,300 M	$ 4,300 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	0	0	0	$ 3,800 M	$ 3,800 M		1:1000	1.3	2.1	1.9	1.8
	1:500	0	0	0	$ 3,300 M	$ 3,300 M		1:500	1.5	2.6	2.3	2.2
Option 4 Doing nothing	1:2500	0	0	0	$ 4,300 M	$ 4,300 M		1:2500	1.2	1.7	1.5	1.5
	1:1000	0	0	0	$ 3,800 M	$ 3,800 M		1:1000	1.3	2.1	1.9	1.8
	1:500	0	0	0	$ 3,300 M	$ 3,300 M		1:500	1.5	2.6	2.3	2.2

Table 32 – Preferred Policy Option – ApoE Approach – Waikato

Waikato		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 21 ,230 M	$ 880 M	24	$ 45,200 M	$ 24,800 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 17 ,400 M	$ 880 M	20	$ 29,900 M	$ 13,400 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 12 ,500 M	$ 880 M	14	$ 18,800 M	$ 7,200 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 21 ,200 M	$ 660 M	32	$ 45,200 M	$ 24,600 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 17 ,400 M	$ 660 M	26	$ 29,900 M	$ 13,200 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 12 ,500 M	$ 660 M	19	$ 18,800 M	$ 7,000 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 7 ,200 M	$ 200 M	36	$ 45,200 M	$ 38,200 M		1:2500	1.4	2.4	2.2	2.1
	1:1000	$ 5 ,800 M	$ 200 M	29	$ 29,900 M	$ 24,400 M		1:1000	1.7	3.1	3.0	2.8
	1:500	$ 4 ,100 M	$ 200 M	21	$ 18,800 M	$ 14,900 M		1:500	2.0	3.8	3.8	3.5
Option 3.1B as above new exposure	1:2500	$ 6 ,200 M	$ 190 M	33	$ 45,200 M	$ 39,200 M		1:2500	1.4	2.6	2.3	2.2
	1:1000	$ 4 ,700 M	$ 190 M	26	$ 29,900 M	$ 25,400 M		1:1000	1.8	3.4	3.2	3.0
	1:500	$ 3 ,300 M	$ 190 M	18	$ 18,800 M	$ 15,700 M		1:500	2.1	4.2	4.1	3.8
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 3 ,500 M	$ 160 M	22	$ 45,200 M	$ 41,800 M		1:2500	1.5	3.1	2.7	2.6
	1:1000	$ 2 ,300 M	$ 160 M	14	$ 29,900 M	$ 27,900 M		1:1000	1.9	4.1	3.8	3.6
	1:500	$ 1 ,300 M	$ 160 M	8	$ 18,800 M	$ 17,700 M		1:500	2.3	5.2	5.1	4.8
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 7 ,200 M	$ 200 M	36	$ 45,200 M	$ 38,200 M		1:2500	1.4	2.4	2.2	2.1
	1:1000	$ 5 ,800 M	$ 200 M	29	$ 29,900 M	$ 24,400 M		1:1000	1.7	3.1	3.0	2.8
	1:500	$ 4 ,100 M	$ 200 M	21	$ 18,800 M	$ 14,900 M		1:500	2.0	3.8	3.8	3.5
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 3 ,500 M	$ 160 M	22	$ 45,200 M	$ 41,800 M		1:2500	1.5	3.1	2.7	2.6
	1:1000	$ 2 ,300 M	$ 160 M	14	$ 29,900 M	$ 27,900 M		1:1000	1.9	4.1	3.8	3.6
	1:500	$ 1 ,300 M	$ 160 M	8	$ 18,800 M	$ 17,700 M		1:500	2.3	5.2	5.1	4.8
Option 4 Doing nothing	1:2500	0	0	0	$ 45,200 M	$ 45,200 M		1:2500	1.5	3.1	2.7	2.6
	1:1000	0	0	0	$ 29,900 M	$ 29,900 M		1:1000	1.9	4.1	3.8	3.6
	1:500	0	0	0	$ 18,800 M	$ 18,800 M		1:500	2.3	5.2	5.1	4.8

Table 33 – Preferred Policy Option – ApoE Approach – Wellington

Wellington		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 24 ,570 M	$ 2,110 M	12	$ 170,000 M	$ 147,600 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 33 ,600 M	$ 2,110 M	16	$ 157,600 M	$ 126,100 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 39 ,900 M	$ 2,110 M	19	$ 141,600 M	$ 103,700 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 24 ,700 M	$ 1,770 M	14	$ 170,000 M	$ 147,100 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 33 ,700 M	$ 1,770 M	19	$ 157,600 M	$ 125,600 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 40 ,000 M	$ 1,770 M	23	$ 141,600 M	$ 103,300 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 16 ,700 M	$ 910 M	18	$ 170,000 M	$ 154,200 M		1:2500	1.0	1.1	1.1	1.1
	1:1000	$ 21 ,300 M	$ 910 M	23	$ 157,600 M	$ 137,200 M		1:1000	1.1	1.1	1.1	1.1
	1:500	$ 24 ,100 M	$ 910 M	26	$ 141,600 M	$ 118,300 M		1:500	1.1	1.2	1.2	1.1
Option 3.1B as above new exposure	1:2500	$ 15 ,900 M	$ 880 M	18	$ 170,000 M	$ 155,000 M		1:2500	1.0	1.1	1.1	1.1
	1:1000	$ 19 ,900 M	$ 880 M	23	$ 157,600 M	$ 138,500 M		1:1000	1.1	1.2	1.2	1.1
	1:500	$ 22 ,000 M	$ 880 M	25	$ 141,600 M	$ 120,400 M		1:500	1.1	1.3	1.3	1.2
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 15 ,300 M	$ 770 M	20	$ 170,000 M	$ 155,500 M		1:2500	1.0	1.1	1.1	1.1
	1:1000	$ 18 ,700 M	$ 770 M	24	$ 157,600 M	$ 139,600 M		1:1000	1.1	1.2	1.2	1.2
	1:500	$ 20 ,200 M	$ 770 M	26	$ 141,600 M	$ 122,100 M		1:500	1.1	1.4	1.3	1.3
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 16 ,700 M	$ 910 M	18	$ 170,000 M	$ 154,200 M		1:2500	1.0	1.1	1.1	1.1
	1:1000	$ 21 ,300 M	$ 910 M	23	$ 157,600 M	$ 137,200 M		1:1000	1.1	1.1	1.1	1.1
	1:500	$ 24 ,100 M	$ 910 M	26	$ 141,600 M	$ 118,300 M		1:500	1.1	1.2	1.2	1.1
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 15 ,300 M	$ 770 M	20	$ 170,000 M	$ 155,500 M		1:2500	1.0	1.1	1.1	1.1
	1:1000	$ 18 ,700 M	$ 770 M	24	$ 157,600 M	$ 139,600 M		1:1000	1.1	1.2	1.2	1.2
	1:500	$ 20 ,200 M	$ 770 M	26	$ 141,600 M	$ 122,100 M		1:500	1.1	1.4	1.3	1.3
Option 4 Doing nothing	1:2500	0	0	0	$ 170,000 M	$ 170,000 M		1:2500	1.0	1.1	1.1	1.1
	1:1000	0	0	0	$ 157,600 M	$ 157,600 M		1:1000	1.1	1.2	1.2	1.2
	1:500	0	0	0	$ 141,600 M	$ 141,600 M		1:500	1.1	1.4	1.3	1.3

Table 34 – Preferred Policy Option – ApoE Approach – West Coast

West Coast		POLICY OPTION: Reduced inventory as per policy option and specified targeted retrofit						Impact on Life Safety under Policy option vs Status-quo 34%				
	APoE	Benefit	Cost	BCR	Total Loss_ unstrengthened	Total Loss_ strengthened		APoE	CS2 Moderate injury	CS3 Serious injury	CS4 Critical injury	CS5 Fatalities
Status quo, 34%*NBS* mitigation	1:2500	$ 8 ,810 M	$ 450 M	20	$ 33,100 M	$ 24,800 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 10 ,300 M	$ 450 M	23	$ 27,900 M	$ 18,000 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 10 ,200 M	$ 450 M	23	$ 22,300 M	$ 12,500 M		1:500	1.0	1.0	1.0	1.0
Option 1	1:2500	$ 8 ,800 M	$ 350 M	26	$ 33,100 M	$ 24,700 M		1:2500	1.0	1.0	1.0	1.0
	1:1000	$ 10 ,300 M	$ 350 M	30	$ 27,900 M	$ 17,900 M		1:1000	1.0	1.0	1.0	1.0
	1:500	$ 10 ,200 M	$ 350 M	29	$ 22,300 M	$ 12,400 M		1:500	1.0	1.0	1.0	1.0
Option 3.1 New seismic zones 1-2 storey URM inside of scope	1:2500	$ 3 ,200 M	$ 100 M	31	$ 33,100 M	$ 30,100 M		1:2500	1.1	1.5	1.4	1.4
	1:1000	$ 3 ,700 M	$ 100 M	35	$ 27,900 M	$ 24,300 M		1:1000	1.2	1.8	1.7	1.6
	1:500	$ 3 ,600 M	$ 100 M	35	$ 22,300 M	$ 18,700 M		1:500	1.3	2.1	2.0	1.9
Option 3.1B as above new exposure	1:2500	$ 2 ,800 M	$ 90 M	30	$ 33,100 M	$ 30,500 M		1:2500	1.1	1.6	1.5	1.4
	1:1000	$ 3 ,100 M	$ 90 M	33	$ 27,900 M	$ 24,900 M		1:1000	1.2	2.0	1.8	1.7
	1:500	$ 2 ,900 M	$ 90 M	31	$ 22,300 M	$ 19,400 M		1:500	1.3	2.4	2.2	2.1
Option 3.2 New seismic zones 1-2 storey URM out of scope	1:2500	$ 2 ,400 M	$ 80 M	28	$ 33,100 M	$ 30,800 M		1:2500	1.1	1.7	1.6	1.5
	1:1000	$ 2 ,500 M	$ 80 M	30	$ 27,900 M	$ 25,400 M		1:1000	1.2	2.2	2.0	1.8
	1:500	$ 2 ,300 M	$ 80 M	28	$ 22,300 M	$ 20,000 M		1:500	1.3	2.7	2.5	2.3
Option 3.3 2017 seismic zones 1-2 storey URM inside of scope	1:2500	$ 3 ,200 M	$ 100 M	31	$ 33,100 M	$ 30,100 M		1:2500	1.1	1.5	1.4	1.4
	1:1000	$ 3 ,700 M	$ 100 M	35	$ 27,900 M	$ 24,300 M		1:1000	1.2	1.8	1.7	1.6
	1:500	$ 3 ,600 M	$ 100 M	35	$ 22,300 M	$ 18,700 M		1:500	1.3	2.1	2.0	1.9
Option 3.4 2017 seismic zones 1-2 storey URM out of scope	1:2500	$ 2 ,400 M	$ 80 M	28	$ 33,100 M	$ 30,800 M		1:2500	1.1	1.7	1.6	1.5
	1:1000	$ 2 ,500 M	$ 80 M	30	$ 27,900 M	$ 25,400 M		1:1000	1.2	2.2	2.0	1.8
	1:500	$ 2 ,300 M	$ 80 M	28	$ 22,300 M	$ 20,000 M		1:500	1.3	2.7	2.5	2.3
Option 4 Doing nothing	1:2500	0	0	0	$ 33,100 M	$ 33,100 M		1:2500	1.1	1.7	1.6	1.5
	1:1000	0	0	0	$ 27,900 M	$ 27,900 M		1:1000	1.2	2.2	2.0	1.8
	1:500	0	0	0	$ 22,300 M	$ 22,300 M		1:500	1.3	2.7	2.5	2.3

10 Traditional CBA Results

Traditional CBA (probability adjusted) results for Policy Option

Benefit includes People/Function/Property.

Note on change of assumptions for Traditional CBA: In the previous report, the focus was primarily on the APoE approach, with the Traditional Cost-Benefit Analysis (CBA) presented only as a supplementary result in the appendices. A further more detailed review and reassessment of the Traditional CBA and probability calculation method has been undertaken. Previously, only five APoE levels were used in the annualised probability approach for the Traditional CBA. The current analysis has been aligned with the HAZUS Technical Manual 6.1 (July 2024), utilising eight APoE levels instead of five for assessing the "current state". This change most significantly affects locations with higher expected earthquake losses (e.g. Wellington), while having minimal impact on areas with lower risk (e.g. Auckland). As a result, BCRs across regions have changed compared to previous results using now eight APoE levels; however, within each region, the relative BCRs for different typologies should remain consistent, although absolute values will be reduced.

Table 34 – Trad CBA results by Region ad Building Category A-T

Traditional CBA results by Region		Status Quo 34%*NBS* (case 200)			Policy Option								
					3.1 New seismic zones, and 1-2 storey URM in scope			3.1B New seismic zones with revised Exposure definition			3.2 New seismic zones, and 1-2 storey URM out of scope		
	Region	NPV	BCR	IRR	NPV	BCR	IRR	NPV	BCR	IRR	NPV	BCR	IRR
									-	-	-		
1	Northland	-	-	-	-	-	-	-	-	-	-	-	-
	• Category A	-	-	-	-	-	-	-	-	-	-	-	-
	• Category B	-	-	-	-	-	-	-	-	-	-	-	-
	• Category C	-	-	-	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-	-	-	-
	• Others Cat	-	-	-	-	-	-	-	-	-	-	-	-
2	Auckland	-$11,558M	0.3	-1.6%	-	-	-	-	-	-	-	-	-
	• Category A	-$1,396M	0.5	0.0%	-	-	-	-	-	-	-	-	-
	• Category B	-$7,144M	0.1	-3.1%	-	-	-	-	-	-	-	-	-
	• Category C	-$368M	0.4	-0.6%	-	-	-	-	-	-	-	-	-
	• Category E	-$521M	0.2	-2.2%	-	-	-	-	-	-	-	-	-
	• Others	-$2,127M	0.4	-0.8%	-	-	-	-	-	-	-	-	-
3	Waikato	-$771M	0.9	1.5%	$543M	1.5	3.5%	$319M	1.3	2.98%	-$482M	0.5	-0.1%
	• Category A	$397M	1.2	2.7%	$968M	3.5	9.7%	$744M	3.5	9.66%	-$56M	0.6	0.4%
	• Category B	-$769M	0.5	-0.2%	-$408M	0.5	-0.4%	-$408M	0.5	-0.39%	-$408M	0.5	-0.4%
	• Category C	-$103M	0.6	0.2%	-	-	-	-	-	-	-	-	-
	• Category E	-$31M	0.7	0.6%	-$17M	0.8	1.2%	-$17M	0.8	1.15%	-$17M	0.8	1.2%
	• Others	-$265M	0.8	1.3%	-	-	-	-	-	-	-	-	-
4	Bay of Plenty	$1,861M	1.8	4.6%	$1,232M	2.6	7.0%	$895M	2.3	5.96%	$404M	1.7	4.1%
	• Category A	$725M	1.8	4.6%	$853M	5.3	15.4%	$516M	4.5	12.71%	$25M	1.4	3.4%
	• Category B	$299M	1.4	3.3%	$369M	1.7	4.2%	$369M	1.7	4.21%	$369M	1.7	4.2%
	• Category C	$24M	1.4	3.3%	-	-	-	-	-	-	-	-	-
	• Category E	$5M	1.2	2.8%	$10M	1.6	4.0%	$10M	1.6	3.97%	$10M	1.6	4.0%
	• Others	$807M	2.4	6.4%	-	-	-	-	-	-	-	-	-
5	Gisborne	$819M	2.3	6.0%	$856M	3.6	10.1%	$255M	2.0	5.04%	$255M	2.0	5.0%
	• Category A	$435M	2.3	6.2%	$609M	5.3	15.5%	$8M	1.1	2.34%	$8M	1.1	2.3%
	• Category B	$206M	1.9	5.0%	$247M	2.4	6.2%	$247M	2.4	6.22%	$247M	2.4	6.2%
	• Category C	$70M	2.0	5.2%	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-	-	-	-
	• Others	$107M	5.7	16.8%	-	-	-	-	-	-	-	-	-

Traditional CBA results by Region		Status Quo 34%*NBS* (case 200)			Policy Option								
					3.1 New seismic zones, and 1-2 storey URM in scope			3.1B New seismic zones with revised Exposure definition			3.2 New seismic zones, and 1-2 storey URM out of scope		
	Region	NPV	BCR	IRR	NPV	BCR	IRR	NPV	BCR	IRR	NPV	BCR	IRR
6	Hawke's Bay	$6,257M	4.2	12.0%	$3,577M	9.9	33.1%	$1,890M	8.8	28.57%	$431M	3.5	9.6%
	• Category A	$3,284M	3.5	9.8%	$3,316M	11.0	38.4%	$1,629M	10.6	36.40%	$170M	2.7	7.1%
	• Category B	$240M	3.6	9.9%	$262M	4.6	13.2%	$262M	4.6	13.23%	$262M	4.6	13.2%
	• Category C	$133M	2.4	6.5%	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-	-	-	-
	• Others	$2,601M	6.8	20.8%	-	-	-	-	-	-	-	-	-
7	Taranaki	-$280M	0.8	1.2%	-$184M	0.7	0.8%	-$184M	0.7	0.77%	-$184M	0.7	0.8%
	• Category A	$90M	1.3	3.1%	-	-	-	-	-	-	-	-	-
	• Category B	-$319M	0.6	0.2%	-$184M	0.7	0.8%	-$184M	0.7	0.77%	-$184M	0.7	0.8%
	• Category C	-$4M	0.9	1.5%	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-	-	-	-
	• Others	-$48M	0.8	1.3%	-	-	-	-	-	-	-	-	-
8	Manawatū-Whanganui	$13,117M	3.0	8.2%	$6,621M	7.5	23.3%	$3,449M	5.5	16.14%	$2,004M	4.9	14.1%
	• Category A	$6,405M	2.7	7.2%	$4,810M	8.4	26.8%	$1,638M	5.1	14.87%	$193M	2.3	6.2%
	• Category B	$1,639M	4.6	13.1%	$1,543M	6.2	18.4%	$1,543M	6.1	18.35%	$1,543M	6.1	18.4%
	• Category C	$128M	1.9	4.9%	-	-	-	-	-	-	-	-	-
	• Category E	$242M	3.6	10.0%	$268M	4.9	14.2%	$268M	4.9	14.16%	$268M	4.9	14.2%
	• Others	$4,704M	3.3	9.1%	-	-	-	-	-	-	-	-	-
9	Wellington	$27,584M	3.2	8.7%	$19,748M	4.6	13.1%	$16,119M	4.1	11.41%	$10,261M	3.2	8.8%
	• Category A	$11,044M	3.6	10.0%	$12,696M	7.3	22.4%	$9,067M	6.0	17.83%	$3,210M	3.7	10.4%
	• Category B	$2,966M	1.9	4.8%	$3,962M	2.6	6.8%	$3,962M	2.6	6.84%	$3,962M	2.6	6.8%
	• Category C	$1,277M	2.9	7.7%	-	-	-	-	-	-	-	-	-
	• Category E	$2,763M	3.3	9.0%	$3,090M	4.4	12.6%	$3,090M	4.4	12.55%	$3,090M	4.4	12.6%
	• Others	$9,534M	4.1	11.6%	-	-	-	-	-	-	-	-	-
10	Tasman	$652M	3.0	8.2%	$39M	15.4	63.3%	-	-	-	-	-	-
	• Category A	$259M	2.7	7.4%	$39M	15.4	63.3%	-	-	-	-	-	-
	• Category B	-	-	-	-	-	-	-	-	-	-	-	-
	• Category C	$10M	1.8	4.6%	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-	-	-	-
	• Others	$383M	3.3	9.1%	-	-	-	-	-	-	-	-	-
11	Nelson	$1,228M	3.2	8.9%	$939M	8.2	26.2%	$346M	4.9	14.08%	$136M	2.8	7.5%
	• Category A	$659M	4.0	11.2%	$802M	16.3	69.4%	$210M	19.1	92.72%	-	-	-
	• Category B	$119M	2.3	6.0%	$136M	2.8	7.5%	$136M	2.8	7.45%	$136M	2.8	7.5%
	• Category C	$34M	2.9	7.9%	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-	-	-	-
	• Others	$416M	2.9	7.9%	-	-	-	-	-	-	-	-	-
12	Marlborough	$650M	3.1	8.5%	$578M	13.4	51.0%	-	-	-	-	-	-
	• Category A	$578M	3.2	8.6%	$578M	13.4	51.0%	-	-	-	-	-	-
	• Category B	-	-	-	-	-	-	-	-	-	-	-	-
	• Category C	$14M	3.6	10.1%	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-	-	-	-
	• Others	$48M	2.5	6.5%	-	-	-	-	-	-	-	-	-

Traditional CBA results by Region		Status Quo 34%*NBS* (case 200)			Policy Option								
					3.1 New seismic zones, and 1-2 storey URM in scope			3.1B New seismic zones with revised Exposure definition			3.2 New seismic zones, and 1-2 storey URM out of scope		
	Region	NPV	BCR	IRR	NPV	BCR	IRR	NPV	BCR	IRR	NPV	BCR	IRR
13	West Coast	$2,377M	1.9	4.9%	$1,330M	3.2	8.6%	$830M	2.5	6.65%	$474M	1.9	5.0%
	• Category A	$778M	2.0	5.1%	$856M	8.3	26.6%	$356M	7.6	23.81%	-	-	-
	• Category B	$300M	1.5	3.5%	$474	1.9	5.0%	$474M	1.9	5.02%	$474M	1.9	5.0%
	• Category C	$75M	1.5	3.6%	-	-	-	-	-	-	-	-	-
	• Category E	$49M	1.8	4.7%	-	-	-	-	-	-	-	-	-
	• Others	$1,176M	2.2	5.8%	-	-	-	-	-	-	-	-	-
14	Canterbury	$8,825M	2.0	5.2%	$3,797M	2.5	6.6%	$3,063M	2.3	6.05%	$1,020M	1.5	3.6%
	• Category A	$2,614	1.9	5.0%	$2,768M	3.6	10.0%	$2,034M	3.4	9.32%	-$8M	1.0	2.0%
	• Category B	$431M	1.4	3.2%	$678M	1.7	4.3%	$678M	1.7	4.33%	$678M	1.7	4.3%
	• Category C	$84M	1.9	4.9%	-	-	-	-	-	-	-	-	-
	• Category E	$208M	1.3	3.0%	$351M	1.6	4.0%	$351M	1.6	4.01%	$351M	1.6	4.0%
	• Others	$5,488M	2.4	6.4%	-	-	-	-	-	-	-	-	-
15	Otago	$939M	1.4	3.2%	$1,393M	1.9	4.9%	-$67M	0.9	1.78%	-$71M	0.9	1.7%
	• Category A	$905M	1.5	3.5%	$1,391M	2.1	5.4%	-$68M	0.9	1.70%	-$72M	0.8	1.4%
	• Category B	-$31M	0.9	1.6%	$12M	1.1	2.2%	$12M	1.1	2.18%	$12M	1.1	2.2%
	• Category C	$9M	1.1	2.3%	-	-	-	-	-	-	-	-	-
	• Category E	-$15M	0.6	0.3%	-$11M	0.7	0.7%	-$11M	0.7	0.66%	-$11M	0.7	0.7%
	• Others	$71M	1.5	3.6%	-	-	-	-	-	-	-	-	-
16	Southland	$4,440M	2.3	6.1%	$3,185M	6.8	20.7%	$2,362M	6.0	17.90%	$194M	1.7	4.3%
	• Category A	$3,317M	2.5	6.7%	$3,063M	8.3	26.3%	$2,239M	7.5	23.33%	$72M	1.5	3.6%
	• Category B	$193M	1.9	4.8%	$123M	2.0	5.1%	$123M	2.0	5.11%	$123M	2.0	5.1%
	• Category C	$81M	1.5	3.6%	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-	-	-	-
	• Others	$847M	2.1	5.4%	-	-	-	-	-	-	-	-	-

Table 35 – Traditional CBA results by Region ad Building Category A-T = Option 3.3 and Option 3.4

Traditional CBA results by Region		Status Quo 34%*NBS* (case 200)			Policy Option					
					3.3 2017 seismic zones, and 1-2 storey URM in scope			3.4 2017 seismic zones, and 1-2 storey URM out of scope		
	Region	NPV	BCR	NPV	BCR	NPV	BCR	NPV	BCR	IRR
1	Northland	-	-	-	-	-	-	-	-	-
	• Category A	-	-	-	-	-	-	-	-	-
	• Category B	-	-	-	-	-	-	-	-	-
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others Cat	-	-	-	-	-	-	-	-	-
2	Auckland	-	-	-	-	-	-	-	-	-
	• Category A	-	-	-	-	-	-	-	-	-
	• Category B	-	-	-	-	-	-	-	-	-
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-
3	Waikato	$543M	1.5	$543M	1.5	$543M	1.5	-$482M	0.5	-0.1%
	• Category A	$968M	3.5	$968M	3.5	$968M	3.5	-$56M	0.6	0.4%
	• Category B	-$408M	0.5	-$408M	0.5	-$408M	0.5	-$408M	0.5	-0.4%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-$17M	0.8	-$17M	0.8	-$17M	0.8	-$17M	0.8	1.2%
	• Others	-	-	-	-	-	-	-	-	-
4	Bay of Plenty	$1,232M	2.6	$1,232M	2.6	$1,232M	2.6	$404M	1.7	4.1%
	• Category A	$853M	5.3	$853M	5.3	$853M	5.3	$25M	1.4	3.4%
	• Category B	$369M	1.7	$369M	1.7	$369M	1.7	$369M	1.7	4.2%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	$10M	1.6	$10M	1.6	$10M	1.6	$10M	1.6	4.0%
	• Others	-	-	-	-	-	-	-	-	-
5	Gisborne	$856M	3.6	$856M	3.6	$856M	3.6	$255M	2.0	5.0%
	• Category A	$609M	5.3	$609M	5.3	$609M	5.3	$8M	1.1	2.3%
	• Category B	$247M	2.4	$247M	2.4	$247M	2.4	$247M	2.4	6.2%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-
6	Hawke's Bay	$3,577M	9.9	$3,577M	9.9	$3,577M	9.9	$431M	3.5	9.6%
	• Category A	$3,316M	11.0	$3,316M	11.0	$3,316M	11.0	$170M	2.7	7.1%
	• Category B	$262M	4.6	$262M	4.6	$262M	4.6	$262M	4.6	13.2%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-
7	Taranaki	-$184M	0.7	-$184M	0.7	-$184M	0.7	-$184M	0.69	0.8%
	• Category A	-	-	-	-	-	-	-	-	-

Traditional CBA results by Region		Status Quo 34%*NBS* (case 200)			Policy Option					
					3.3 2017 seismic zones, and 1-2 storey URM in scope			3.4 2017 seismic zones, and 1-2 storey URM out of scope		
	Region	NPV	BCR	NPV	BCR	NPV	BCR	NPV	BCR	IRR
	• Category B	-$184M	0.7	-$184M	0.7	-$184M	0.7	-$184M	0.69	0.8%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-
8	Manawatū-Whanganui	$6,621M	7.5	$6,621M	7.5	$6,621M	7.5	$2,004M	4.9	14.1%
	• Category A	$4,810M	8.4	$4,810M	8.4	$4,810M	8.4	$193M	2.3	6.2%
	• Category B	$1,543M	6.2	$1,543M	6.2	$1,543M	6.2	$1,543M	6.1	18.4%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	$268M	4.9	$268M	4.9	$268M	4.9	$268M	4.9	14.2%
	• Others	-	-	-	-	-	-	-	-	-
9	Wellington	$19,748M	4.6	$19,748M	4.6	$19,748M	4.6	$10,261M	3.2	8.8%
	• Category A	$12,696M	7.3	$12,696M	7.3	$12,696M	7.3	$3,210M	3.7	10.4%
	• Category B	$3,962M	2.6	$3,962M	2.6	$3,962M	2.6	$3,962M	2.6	6.8%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	$3,090M	4.4	$3,090M	4.4	$3,090M	4.4	$3,090M	4.4	12.6%
	• Others	-	-	-	-	-	-	-	-	-
10	Tasman	$39M	15.4	$39M	15.4	$39M	15.4	-	-	-
	• Category A	$39M	15.4	$39M	15.4	$39M	15.4	-	-	-
	• Category B	-	-	-	-	-	-	-	-	-
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-
11	Nelson	$939M	8.2	$939M	8.2	$939M	8.2	$136M	2.8	7.5%
	• Category A	$802M	16.3	$802M	16.3	$802M	16.3	-	-	-
	• Category B	$136M	2.8	$136M	2.8	$136M	2.8	$136M	2.8	7.5%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-
12	Marlborough	$567M	13.2	$567M	13.2	$567M	13.2	-	-	-
	• Category A	$567M	13.2	$567M	13.2	$567M	13.2	-	-	-
	• Category B	-	-	-	-	-	-	-	-	-
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-
13	West Coast	$1,330M	3.2	$1,330M	3.2	$1,330M	3.2	$474M	1.9	5.0%
	• Category A	$856M	8.3	$856M	8.3	$856M	8.3	-	-	-
	• Category B	$474	1.9	$474	1.9	$474	1.9	$474M	1.9	5.0%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-
14	Canterbury	$3,802M	2.5	$3,802M	2.5	$3,802M	2.5	$1,020M	1.5	3.6%
	• Category A	$2,773M	3.6	$2,773M	3.6	$2,773M	3.6	-$8M	1.0	2.0%

Traditional CBA results by Region		Status Quo 34%*NBS* (case 200)			Policy Option					
					3.3 2017 seismic zones, and 1-2 storey URM in scope			3.4 2017 seismic zones, and 1-2 storey URM out of scope		
	Region	NPV	BCR	NPV	BCR	NPV	BCR	NPV	BCR	IRR
	• Category B	$678M	1.7	$678M	1.7	$678M	1.7	$678M	1.7	4.3%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	$351M	1.6	$351M	1.6	$351M	1.6	$351M	1.6	4.0%
	• Others	-	-	-	-	-	-	-	-	-
15	Otago	$406M	8.2	$406M	8.2	$406M	8.2	-$71M	0.9	1.7%
	• Category A	$416M	18.0	$416M	18.0	$416M	18.0	-$72M	0.8	1.4%
	• Category B	-	-	-	-	-	-	$12M	1.1	2.2%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-$11M	0.7	-$11M	0.7	-$11M	0.7	-$11M	0.7	0.7%
	• Others	-	-	-	-	-	-	-	-	-
16	Southland	$3,185M	6.8	$3,185M	6.8	$3,185M	6.8	$194M	1.7	4.3%
	• Category A	$3,063M	8.3	$3,063M	8.3	$3,063M	8.3	$72M	1.5	3.6%
	• Category B	$123M	2.0	$123M	2.0	$123M	2.0	$123M	2.0	5.1%
	• Category C	-	-	-	-	-	-	-	-	-
	• Category E	-	-	-	-	-	-	-	-	-
	• Others	-	-	-	-	-	-	-	-	-