

Developing the Clients perspective
for efficient earthquake proofing of
buildings

“Seismic is the new Green”

Financial Aspects / Risk

cost per square metre to strengthen

	34%NBS	67%NBS	100%NBS
Pre 1935 buildings	\$300	\$510	\$615
1935 – 1976 buildings	\$416	\$640	\$807

Financial Aspects / Risk

Summary of CBA Model Strengthening Costs*

3 strengthening options: (1) 33% with reduced timing; (2) 67%; (3) 100%

Total Strengthening Costs	Total Real \$M	NPV \$M
<33% to 33% current timing 28 years	\$3,598M	\$958M
<33% to 33% policy timing 15 years	\$3,598M	\$1,717M
Incremental cost vs current 33% case	\$0M	\$760M
<33% to 67%	\$6,117M	\$2,919M
33% - 67% to 67%	\$10,000M	\$4,772M
total cost to strengthen to 67%	\$16,117M	\$7,692M
Incremental cost vs current 33% case	\$12,519M	\$6,734M
<33% to 100%	\$7,376M	\$3,520M
33 – 67% to 100%	\$12,599M	\$6,012M
Total cost to strengthen to 100%	\$19,975M	\$9,533M
Incremental cost vs current 33% case	\$16,377M	\$8,575M

* Martin Jenkins – Indicative CBA Model for Earthquake prone building review- September 2012

Financial Aspects / Risk

	Estimated deaths – daytime working				Return period	Estimated building collapses			
	Do nothing	33%NBS	67% NBS	100% NBS		Do nothing	33%NBS	67% NBS	100% NBS
Wellington									
MM8	0	0	0	0	120	0	0	0	0
MM9	29	20	8	5	400	5	4	2	1
MM10	380	290	142	84	1500	41	31	17	10
MM11	1521	1175	692	448	8500	204	151	83	48
Expected annual impact	0.50477	0.38157	0.19608	0.1211		0.06383	0.04843	0.02610	0.01481

Financial Aspects / Risk – Summary*

- On a probability basis, costs are well in excess of benefits.
- Even under extreme sensitivities, this relationship does not change.
- On an actual event basis, there is only a short time window where higher strengthening options show net benefits.
- The CBA alone does not support higher levels of strengthening – or shorter timeframes.

Building Code

- % NBS
- Snapshot in Time
- Reflection of Economic Wellbeing
- Standards Procedure

“we require a building to be as strong as we can afford it to be at a particular moment in time”

- How do we measure the strength of a building?

The IEP

What is it?

Rough Screening Tool

Variables:

- Importance Level
- Critical Structural Weaknesses
- Discretion Factor
- Age
- Construction type – system / material
- Previous strengthening
- Soil type

Alternatives

- Modeling
- 80/20 approach
- Removing CSW's

NZS4219 -2009

“The Forgotten Standard”

- Recommendation only.
- Paid lip service.
- Needs to be incorporated into Building Code.
- Previous events continually ignored.