Developing the Clients perspective for efficient earthquake proofing of buildings

“Seismic is the new Green”

Overview

- Rationale
- Financial Aspects / Risk
- The Building Code
- Infrastructure vs Buildings
- Alternative Courses of Action

Rationale

Current Proposal – Options

1. do nothing
2. strengthen to 33% in shorter time frame
3. strengthen to 67%
4. strengthen to 100%

Rationale

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Emotional Reaction – *Economic Suicide* ?

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

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

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"

Question

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

IEP

Consistency is important

"The IEP assessment methodology requires an assessor to make many subjective judgments. A robust system of verification of results, consistency checks, cross checks and continuous discussion among the assessors is required to avoid such inconsistencies."

J.K. Bothara, R.D.Jury, K.Wheeler, C.Stevens

Infrastructure

- Horizontal infrastructure – 3 waters / roads /utilities / water retaining structures.
- Wellington – gas.
- Kobe experience.
- Where should we spend the money ?

Alternatives

- Modeling
- 80/20 approach
- Removing CSW’s
- New technologies

Conclusions

- On any logical basis, a change to current policy cannot be justified.
- Genuine Heritage Buildings treated as separate case – National / Local Government Funding.
- Adopt a “most for least” 80/20 approach.
- Treat the IEP as the very rough screening tool it was always intended to be.