



Framework Models for Adaptation Strategies for Buildings

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Presentation at the 2010 International Climate Change
Adaptation Conference, June 2010, Gold Coast



Australian Building Codes Board ABCBC

- Responsible for writing the Building Code of Australia (BCA)
- BCA applies to new buildings and renovations
- BCA updated annually
- 'Policy delivery vehicle'



Context

- Desire to 'do something about climate change'
- Required to comply with OBPR Guidelines
- Therefore need a way to model proposed policy interventions
- Lack of quantitative data
- Need a testable hypothesis



Our big question

- Which is increasing faster:
 - the resilience of buildings to extreme events due to improved regulations OR
 - the intensity and frequency of extreme events due to climate change?



The answer: Modelling

- Two approaches to modelling were used
 - Reliability as the metric
 - Fragility as the metric
- Case study chosen based on available data: cyclonic wind events and 1980 regulation change

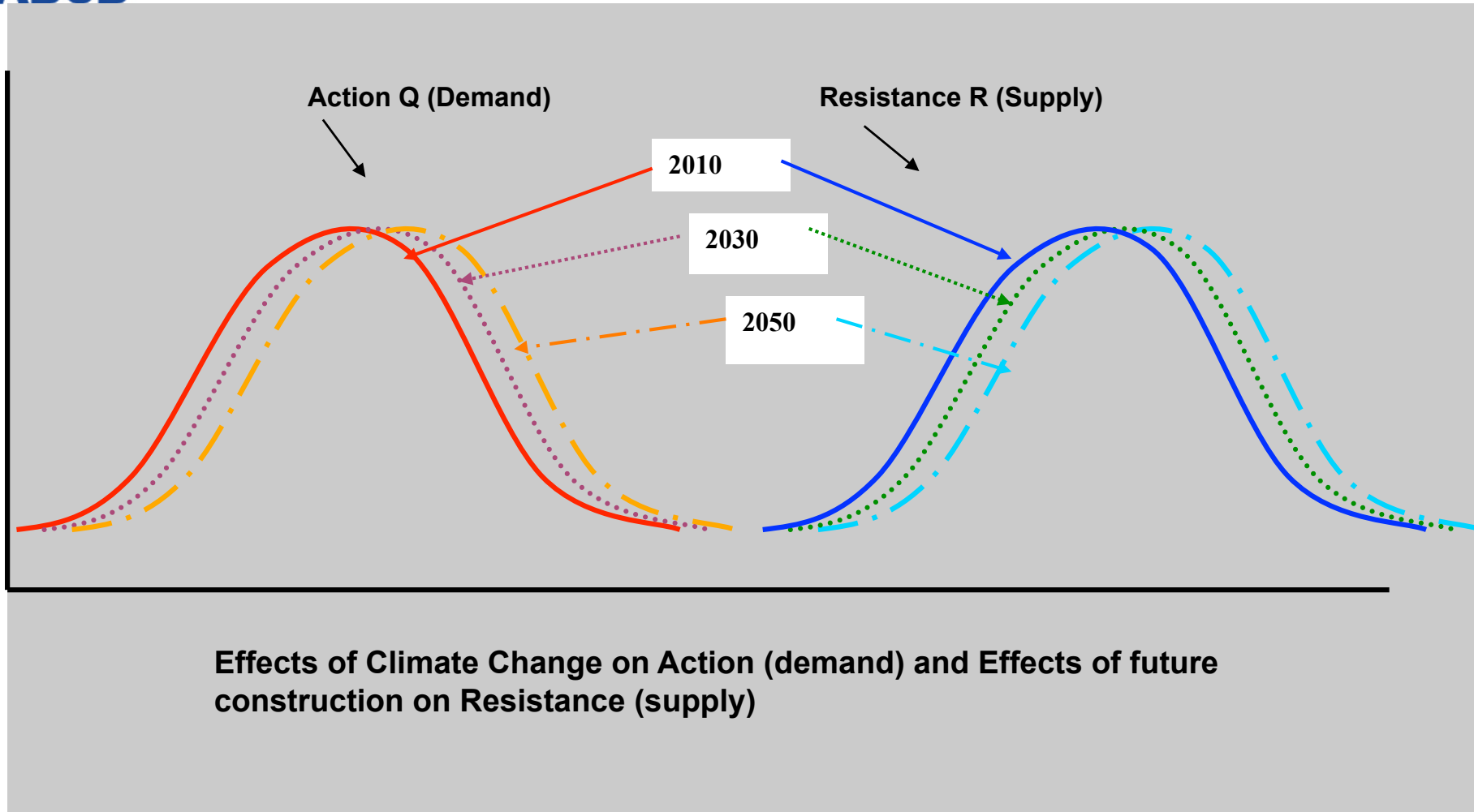


Reliability modelling

- Used in structural engineering
- Uncertainty model
- Can assign various values to 'demand' and 'supply'

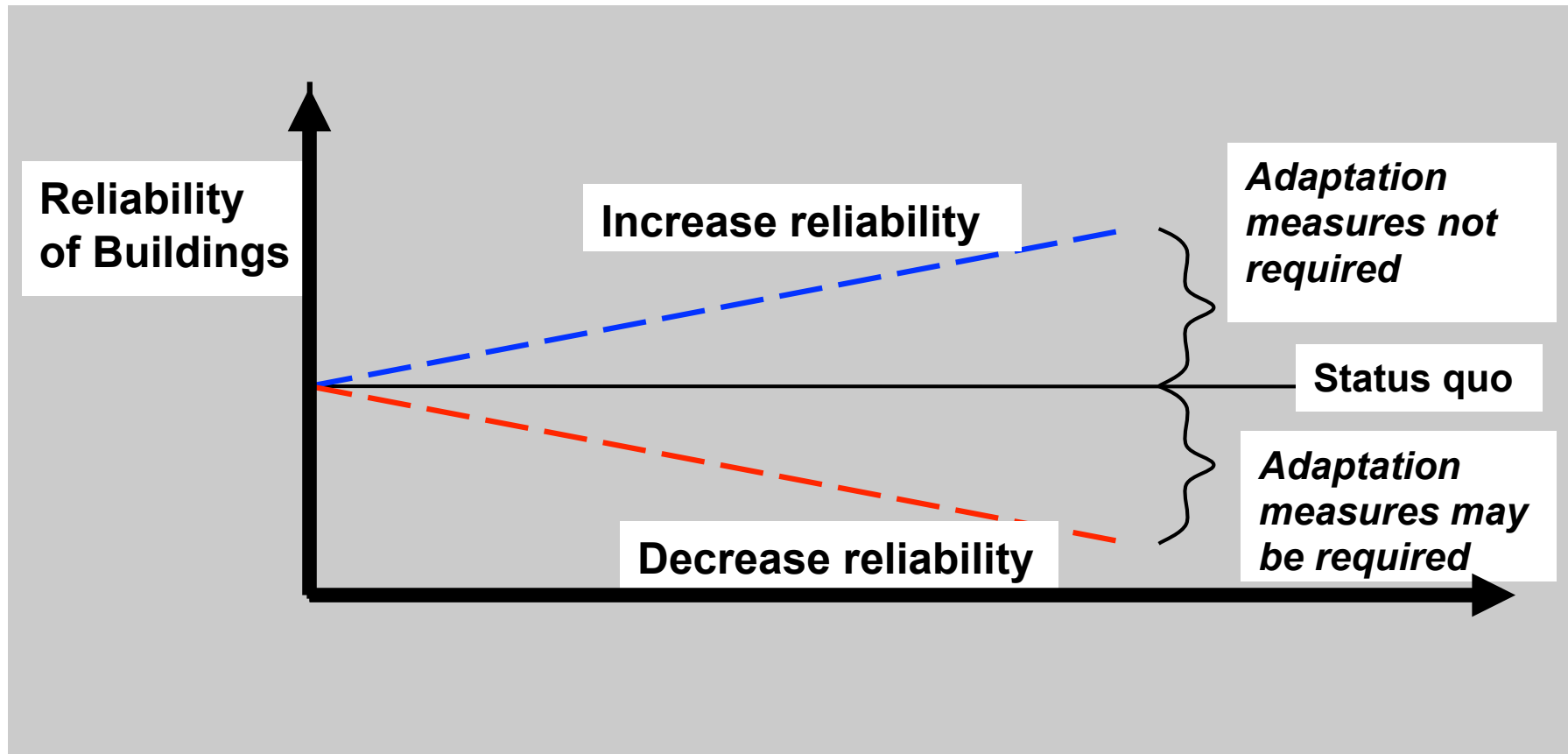


Reliability modelling concept





Reliability Model



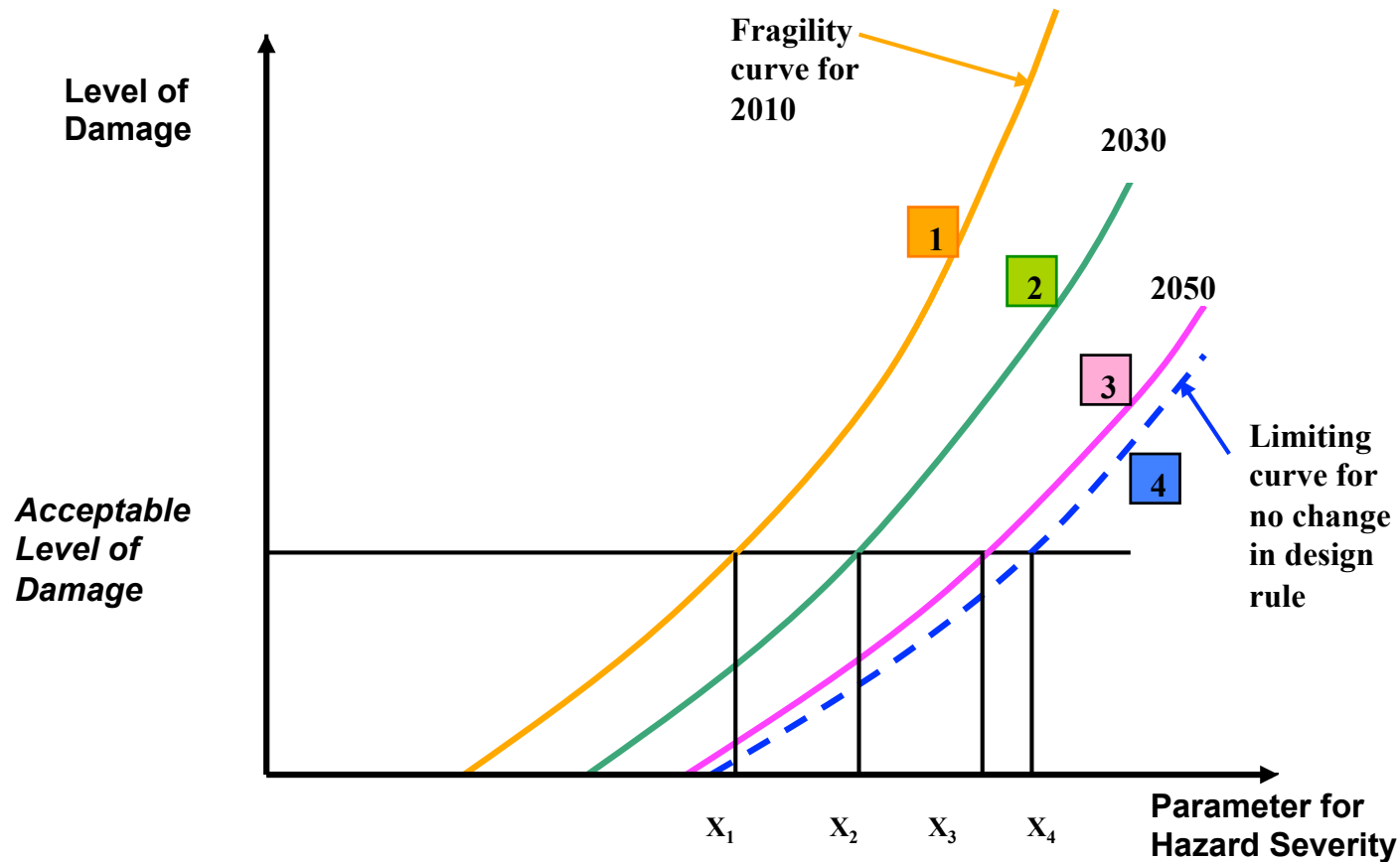


Fragility modelling

- Used in (re)insurance industry and seismology
- Deterministic model
- Can compare current and future risk profiles



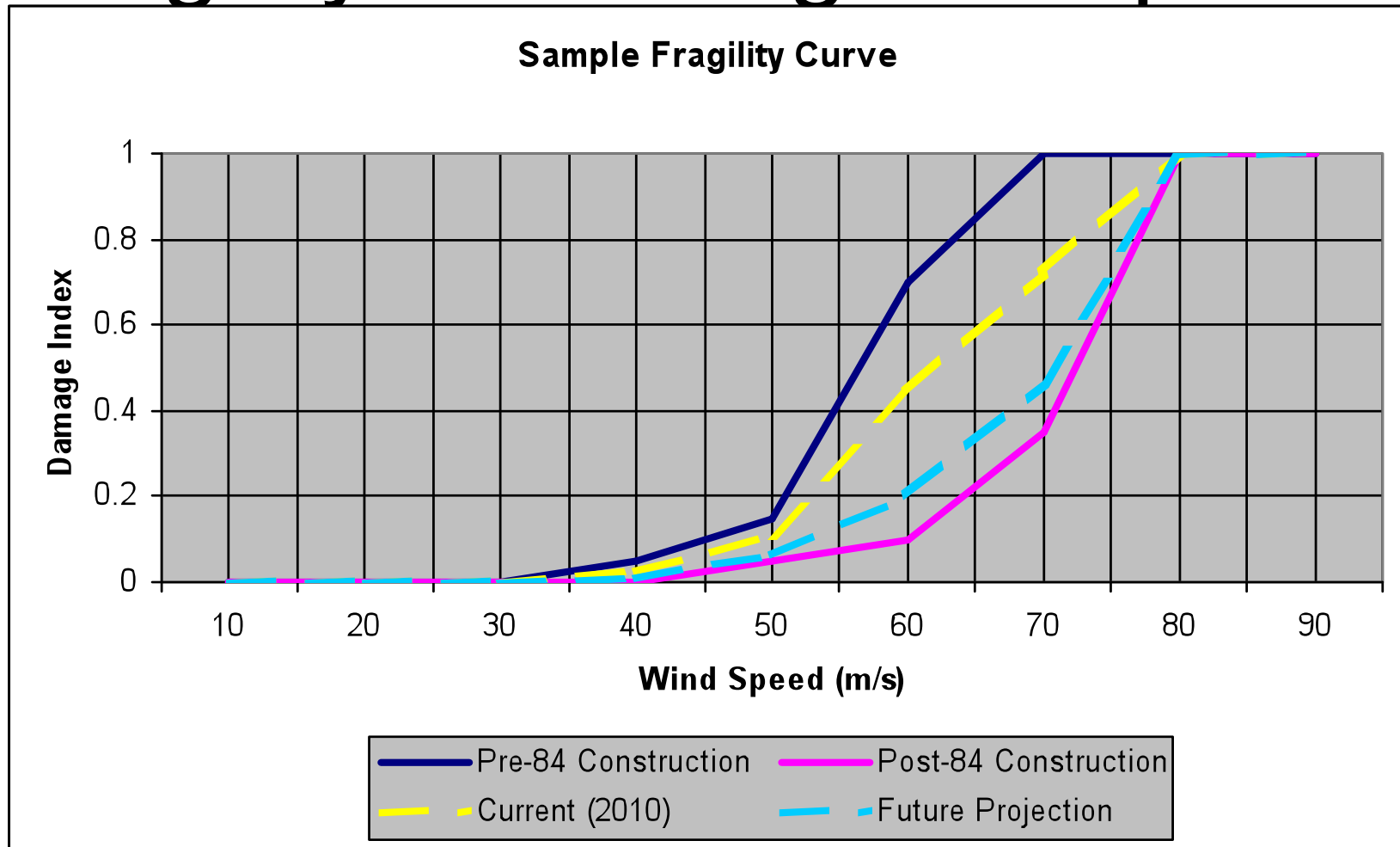
Fragility modelling concept



Use of Fragility Curves to decide whether Adaptation Measures are Necessary



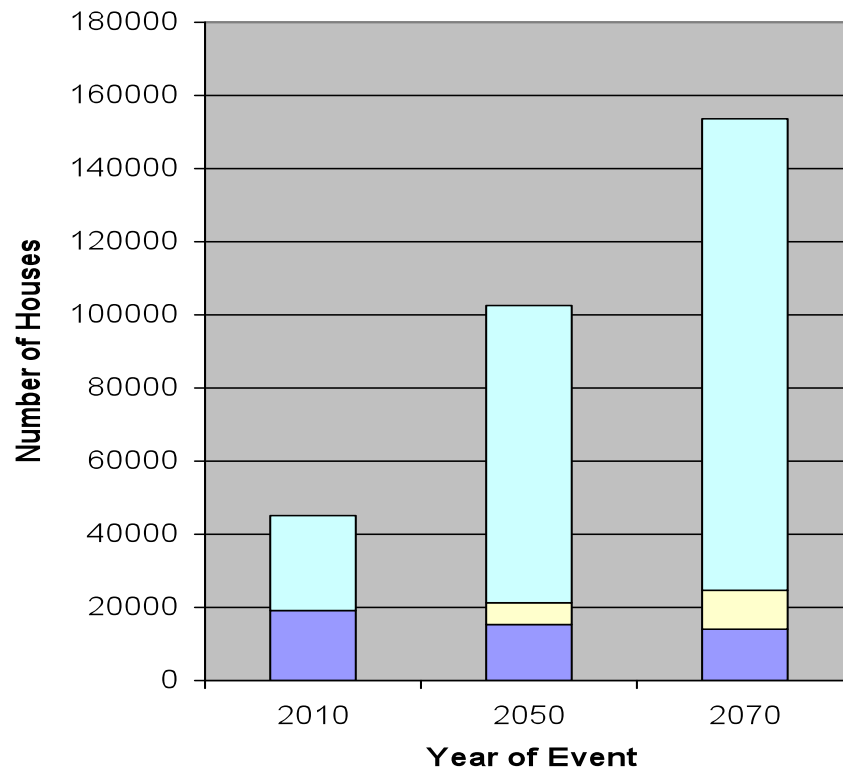
Fragility modelling example



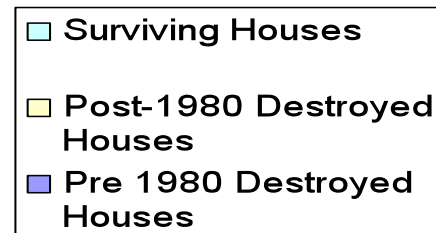


Sample Event

Destroyed Houses by Category for Hypothetical 60m/s Wind Event



- Absolute losses increase slightly
- Proportional losses decrease sharply



's Future



Conclusions

- The two modelling methods are in agreement
- May be more effective to retrofit than alter regulations
- The approach helped to identify what data was needed



Future Use

- Able to compare current risk profile to a projected risk profile
- Identify most effective policy interventions
- Useful where there is dual uncertainty – climate change and demographic change



Questions?

Building Australia's Future



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