Technical Needs for Seismic Regulations for Existing Buildings

Practitioner’s Perspective
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Objective

Bring the inventory of buildings in a community up to a standard of seismic resistance before the next significant earthquake.
Focus away from West Coast

• Nature of Seismic Hazard
• Nature of the Building Inventory
Seismic Hazards

- High Hazards
  - Middle Mississippi Valley
  - Wasatch Front
  - South Carolina

- Moderate and Low Hazards
  - Large areas
  - Large cities
Nature of the Hazard

• Generally not as well understood
  – Even though we have a longer written history
  – Classic low frequency but high consequence event

• New Madrid’s unusual characteristic
  – Multiple large events in a sequence
Nature of the Inventory

• Large and densely populated cities
• Higher fraction of older styles of construction
• Lots of reuse of older buildings – mostly driven by economic interest, but by historic preservation
• Highly variable rates of growth
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- Total number of buildings increases 1% per year
- “Removed” old buildings either demolished or converted to “new” by rehabilitation
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- Half life of existing buildings is 50 years
- Total number of buildings increases 1% per year
- “Removed” old buildings either demolished or converted to “new” by rehabilitation
- 1% of “old” buildings rehabilitated each year
Revised building half-life to 100 years, but without mandatory rehabilitation; other assumptions unchanged.
What do we need?

• Better characterization of the population of existing buildings away from the West Coast
  – Effective life – and how it varies with type of use and construction
  – Which structures are likely killers

• Better characterization of the seismic hazard – the Poisson assumption is likely not be good enough for this purpose