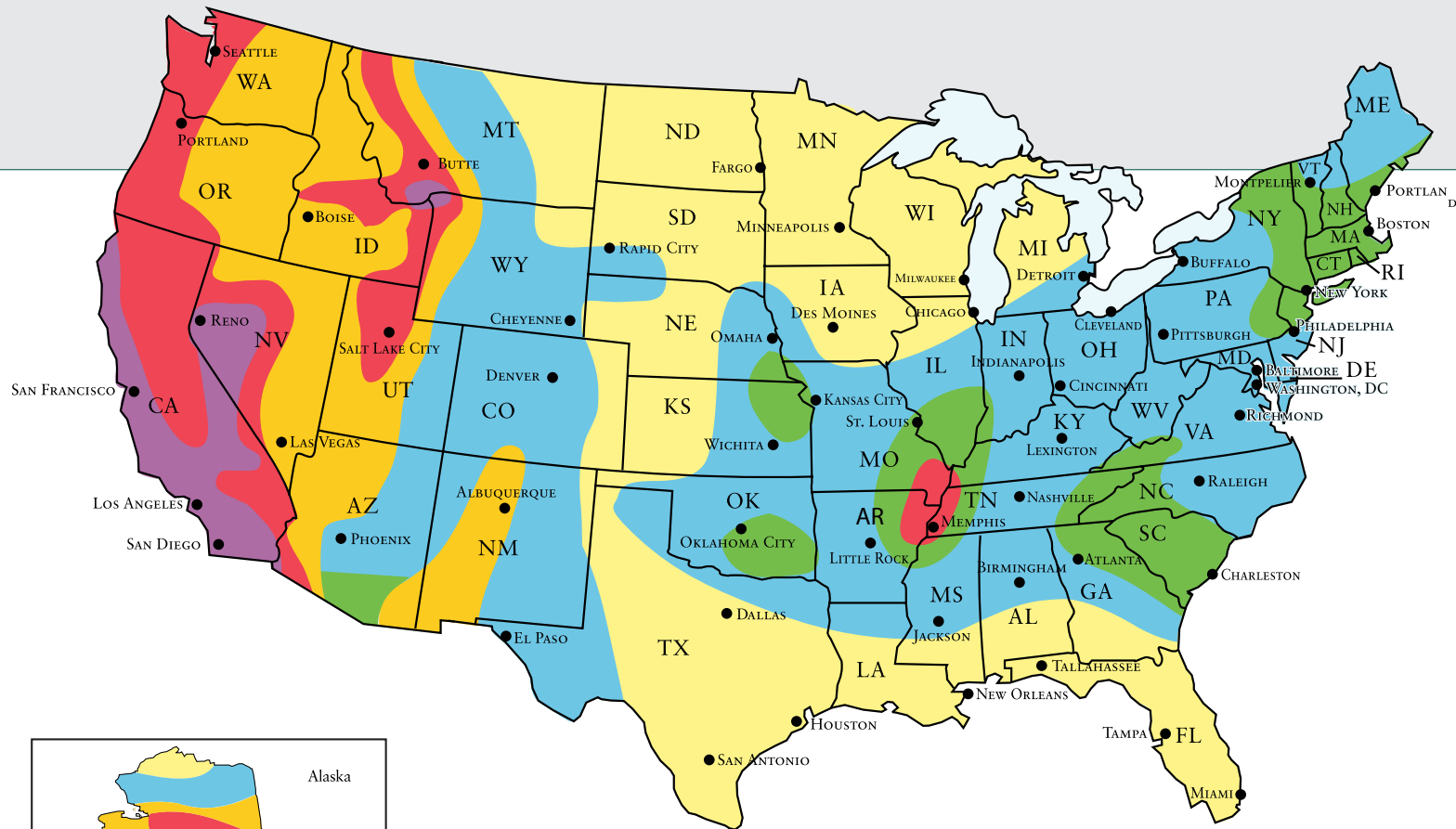


## Seismic Risk Analysis

### Seismic Zones

- Zone 0 = 0
- Zone 1 = 0.075
- Zone 2A = 0.15
- Zone 2B = 0.20
- Zone 3 = 0.3
- Zone 4 = 0.4



(Source: ICBO, 1997)

- Zone 0** An area with very low probability of damaging ground motion.
- Zone 1** An area with low probability of damaging ground motion.
- Zone 2A** An area with low-to-moderate probability of damaging ground motion.
- Zone 2B** An area with moderate probability of damaging ground motion.
- Zone 3** An area with moderate-to-high probability of damaging ground motion.
- Zone 4** An area with high probability of damaging ground motion.

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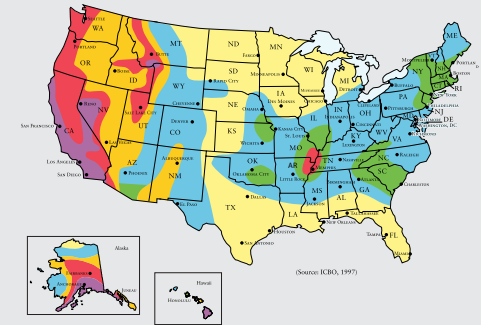
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DECISION INTELLIGENCE

# Seismic Risk Analysis



## Probable Maximum Loss (PML)

PML is a general term that has been used to characterize the building damageability resulting from a major earthquake. The PML represents the ratio of estimated earthquake damage repair cost (not including damage to building contents or equipment) divided by the current replacement cost of the improvements. The PML is expressed as a percentage of the building's current replacement cost. Replacement costs do not include the value of the land nor do they refer to the market value of the property.

The PML is derived from a statistical predictive analysis of the structure based on an earthquake that has a 10 percent chance of exceedance in a 50-year exposure period, also known as a probabilistic 475-year Design Basis Earthquake event (DBE). Stated differently, this earthquake scenario has a 90% confidence of not being exceeded within a 50-year time period. For commercial mortgage backed securities, the American Society for Testing and Materials (ASTM) E2557-07 document defines the PML in terms of a Scenario Expected Loss (see definition below) resulting from a 475-year seismic event (DBE).

## Scenario Expected Loss (SEL)

SEL is the American Society for Testing and Materials (ASTM) term that is used to characterize the expected building damageability resulting from a specified scenario earthquake event. The SEL is the expected (mean) earthquake loss to the building, (not including damage to building contents or equipment) resulting from a specified seismic induced ground motion (peak ground acceleration) or a specific earthquake event on a specific faults affecting the building. When a probabilistic 475-year earthquake (DBE) event is used in the damageability analysis, the term SEL-DBE has commonly been used interchangeably with the term "PML."

## Scenario Upper Loss (SUL)

SUL is the American Society for Testing and Materials (ASTM) term that is used to characterize an upper bound building damageability resulting from a specified scenario earthquake event. The SUL is the statistical upper bound scenario loss in which 9 out of 10 building would not be expected to exceed. When a probabilistic 475-year earthquake (DBE) event is used in the damageability analysis, the term SUL-DBE is used.

## Alquist Priolo Zones

The Earthquake Fault Zones identified by the State of California, Department of Conservation, Division of Mines and Geology, are areas located within 500 ft. of a major active earthquake fault and 200-300 feet from well defined minor faults. These areas have a relatively high potential for surface rupture. Section 3603 of the Alquist-Priolo Earthquake Zoning Act states "No structure for human occupancy defined as a 'project' is permitted on the trace of an active fault."

## Map Notes

The seismic map on the opposite side of this page was taken from the 1997 Uniform Building Code. This seismic zone map identifies the seismic zones by the numbers from 0 to 4. Seismic zone factors are defined for each zone as follows:

- Zone 0 - An area with very low probability of damaging ground motion.
- Zone 1 - An area with low probability of damaging ground motion.
- Zone 2A - An area with low-to-moderate probability of damaging ground motion.
- Zone 2B - An area with moderate probability of damaging ground motion.
- Zone 3 - An area with moderate-to-high probability of damaging ground motion.
- Zone 4 - An area with high probability of damaging ground motion.

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