



- Public education; and
- Disincentives including fines and fees for those who choose to take the risk of that hazard.

### Policies:

- S 1.3 Require structural and nonstructural assessment and, when necessary, mitigation, of other types of potentially hazardous buildings that: 1) are undergoing substantial repair or improvements resulting in more than half of the assessed property value, or 2) are considered an element of blight in a redevelopment district. Potential implementation measures could include: (AI 81, 88, 89, 90, 100)
- a. Use of variances, tax rebates fee waivers, credits, or public recognition as incentives.
  - b. Inventory and structural assessment of potentially hazardous buildings based on screening methods developed by the Federal Emergency Management Agency.
  - c. Development of a mandatory retrofit program for hazardous, high occupancy, essential, dependent or high-risk facilities.
  - d. Development of a mandatory program requiring public posting of seismically vulnerable buildings.



*Lessons learned from recent earthquakes and extensive scientific research conducted as part of the National Earthquake Hazard Reduction Program (NEHRP) have led to significant improvements in building codes. Adopted by the County of Riverside in July 1999, the 1997 Uniform Building Code (UBC) is a prime example of an effort to reduce hazard risks in response to recent earthquakes. Seismic codes will continue to improve under the International Building Code, which replaced the UBC in the year 2000.*



*Building damage is commonly classified as either **structural** or **non-structural**. Structural damage impairs the building's structural support. This includes any vertical and lateral force-resisting systems, such as frames, walls, and columns. Non-structural damage does not affect the integrity of the structural support system. Non-structural damage includes broken windows, collapsed or rotated chimneys, and fallen ceilings.*

## HAZARD SPECIFIC ISSUES AND POLICIES

### Seismic Hazards

While Riverside County is at risk from many natural and man-made hazards, the event with the greatest potential for loss of life or property and economic damage is an earthquake. This is true for most of southern California, since damaging earthquakes are frequent, affect widespread areas, trigger many secondary effects, and can overwhelm the ability of local jurisdictions to respond. In Riverside County, earthquake-triggered geologic effects include ground shaking, fault rupture, landslides, liquefaction, subsidence, and seiches, all of which are discussed in the Safety Element Technical Background Report, Appendix H. Earthquakes can also cause human-made hazards such as urban fires, dam failures, and toxic chemical releases.

Earthquake risk is very high in the most heavily populated western portion of the County and the Coachella Valley, due to the presence of two of California's most active faults, the San Andreas and San Jacinto. Risk is moderate in the eastern portion of the County beyond the Coachella Valley.

Most of the loss of life and injuries from earthquakes are due to damage and collapse of buildings and structures. Building codes have generally been made more stringent following damaging earthquakes. However, in the County of Riverside, structures built prior to improved building codes have generally not been upgraded to current standards, and are vulnerable in earthquakes.



Comprehensive hazard mitigation programs that include the identification and mapping of hazards, prudent planning and enforcement of building codes, and expedient retrofitting and rehabilitation of weak structures can significantly reduce the scope of an earthquake disaster.

The intent of these policies is to minimize the impact of earthquakes on Riverside County's citizens, property, and economy.

### **Fault Rupture**

Primary ground damage due to earthquake fault rupture typically results in a relatively small percentage of the total damage in an earthquake, but proximity to a rupturing fault can cause profound damage. It is difficult to reduce this hazard through structural design. The primary mitigative technique is to set back from, and avoid, active faults. The challenge comes in identifying all active faults. Faults throughout southern California have formed over millions of years. Some of these faults are generally considered inactive under the present geologic conditions; that is, they are unlikely to generate further earthquakes. Other faults are known to be active. Such faults have either generated earthquakes in historical times (within the last 200 years), or show geologic and geomorphic indications of relatively recent movement. Faults that have moved in the relatively recent geological past are generally presumed to be the most likely candidates to generate damaging earthquakes in the lifetimes of residents, buildings, or communities (Figure S-1).

The State Alquist-Priolo Earthquake Fault Zoning Act (A-P Act) was passed in 1972 to mitigate the hazard of surface faulting. Surface rupture is the most easily avoided seismic hazard. The main purpose of the A-P Act is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The A-P Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. Alquist-Priolo Earthquake Fault Zones have been designated by the California Division of Mines and Geology for the Elsinore, San Jacinto, and San Andreas fault zones in Riverside County.

Within the rapidly growing county, State A-P mapping has not kept pace with development. The County of Riverside has zoned fault systems and required similar special studies prior to development. These are referred to as County Fault Zones on Figure S-2 and in the Technical Background Report. They generally represent zones that have been identified from groundwater studies, and should be viewed as doubtful. However, until solid field evidence is generated to prove or disprove their existence, they should continue to be considered a hazard.

Within A-P and County Fault Zones, proposed tracts of four or more dwelling units must investigate the potential for and setback from ground rupture hazards. This is typically accomplished by excavation of a trench across the site, determining the location of faulting, and establishing building setbacks.

As there are many active faults in Riverside County, with new fault strands being continually discovered, all proposed structures designed for human occupancy should be required to investigate the potential for and setback from ground rupture. Also of concern are structures, not for human occupancy, that can cause harm if damaged by an earthquake, such as utility, communications, and transportation lifelines.