



Special development regulations can reinforce and augment existing code standards by raising the level of hazard-conscious project design and mitigation engineering. Examples include additional geologic/geotechnical investigation and additional reinforcement of foundations in areas of potential ground failure. While foundation investigations are required by the County's Building Code, it is important to emphasize expected levels of investigation and protection. Furthermore, some requirements that may only apply to critical facilities, such as detailed seismic analyses, could be expanded to include other structures and lifelines. Where engineering methods cannot mitigate the hazards, avoidance of the hazard is appropriate, such as where ground rupture along active or potentially active fault traces are identified during project investigation. Special minimum setbacks away from active faults, which are already required for critical facilities, can also be defined for other structures and lifelines.

Policies:

- S 1.1 Mitigate hazard impacts through adoption and strict enforcement of current building codes, which will be amended as necessary when local deficiencies are identified.
- S 1.2 Enforce state laws aimed at identification, inventory, and retrofit of existing vulnerable structures.

Hazard Reduction

Hazard reduction programs are designed to improve the safety of existing development. For example, older structures, built to superseded code standards, may need seismic upgrading. Owners of older structures may voluntarily upgrade, be strongly persuaded to upgrade, or be required to do so. Additional examples of hazard reduction programs include:

- Strengthening pipelines and developing emergency back-up capability by public utilities serving the County;
- Conducting regular fire safety inspections and fire flow tests to identify areas with cracked or damaged water lines;
- Encouraging the construction of auxiliary water systems to supplement existing water lines. This will help ensure adequate water flow for fire suppression even if main water lines are damaged. Gravity-fed or generator-operated pumps for swimming pools and tanks can also supplement flow;
- Planning for emergency response at the government and individual level to reduce the risk to the public from hazards; and
- Identifying unsafe structures and posting public notices.

To reduce hazards in areas mapped as hazard zones, the County of Riverside uses a combination of methods:

- Special investigation and reporting requirements;
- Land use planning;
- Real-estate disclosure;
- Incentives to encourage mitigation;



- 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.