



- S 7.4 Use incentives and disincentives to persuade private businesses, consortiums, and neighborhoods to be self-sufficient in an emergency by:
- maintaining a fire control plan, including an onsite fire fighting capability and volunteer fire response teams to respond to and extinguish small fires; and
 - identifying medical personnel or local residents who are capable and certified in first aid and CPR.

- S 7.5 Conduct regional earthquake drills and, where appropriate: (AI 82)

- utilize HAZUS results in the Technical Background Report to develop internal scenarios for emergency response; and
- test back-up power generators in public facilities and other critical facilities taking part in the earthquake drill.

- S 7.6 Improve management and emergency dissemination of information using portable computers with geographic information systems and disaster-resistant Internet access, to obtain: (AI 86)

- hazardous Materials Disclosure Program Business Plans regarding the location and type of hazardous materials;
- real-time information on seismic, geologic, or flood hazards; and
- the locations of high-occupancy, immobile populations, potentially hazardous building structures, utilities and other lifelines.



HAZUS Earthquake Scenario Loss Estimations:

HAZUS is a standardized methodology for earthquake loss estimation based on GIS. HAZUS is designed for use by state, regional and local governments in planning for earthquake loss mitigation, emergency preparedness, response and recovery. The Safety Element Technical Background Report (Appendix H) provides a detailed earthquake loss estimation for Riverside County.

Critical Facilities and Lifelines

Critical facilities are parts of infrastructure that must remain operational after an earthquake, or facilities that pose unacceptable risks to public safety if severely damaged. In Riverside County, critical facilities include schools, hospitals, fire and police stations, emergency operation centers, communication centers, dams, and industrial sites that use or store explosives, toxic materials or petroleum products. It is essential that critical facilities have no structural weaknesses that can lead to collapse.

Critical facilities may provide only limited services if lifelines are disrupted. The issue of seismic hazard mitigation for lifelines is very complex, given the diversity of lifeline facilities. The effects of strong ground motion applies to structures involved in lifeline service, such as the control tower in an airport, or the buildings that house computers and telephone circuits that are central to communication lifelines. Strong ground motion can also result in damage to freeway interchanges and bridges that are essential for successful transportation lifelines. When properly designed, manufactured and laid out, buried pipelines are generally not damaged by strong ground motions, but can be severely disrupted in areas of surface rupture, liquefaction, or landslides.

Figures S-12 through S-21 depict the locations of hospitals, emergency response facilities, school locations, communications facilities, dams, transportation facilities, hazardous materials sites, and natural resource lifelines in relation to varying degrees of ground shaking risk. Each figure illustrates the geographical



Critical Facilities: Facilities housing or serving many people, that are necessary in the event of an earthquake or flood, such as hospitals, fire, police, and emergency service facilities, utility "lifeline" facilities, such as water, electricity, and gas supply, sewage disposal, and communications and transportation facilities.



relationship between the County's critical facilities and lifelines and the potential for ground shaking. The purpose of these maps is not to convey specifics, but rather to convey a picture of the concern that the County can use to gain an appreciation of potential risk associated with ground shaking.

Policies:

- S 7.7 Strengthen the project permit and review process to ensure that proper actions are taken to reduce hazard impacts and to encourage structural and nonstructural design and construction. Damage must be minimized for critical facilities, and susceptibility to structural collapse must be minimized, if not eliminated.
- a. Ensure that special development standards, designs, and construction practices reduce risk to tolerable levels for projects involving critical facilities, large-scale residential development, and major commercial or industrial development through conditional use permits and the subdivision review process. If appropriate, impact fees should be assessed to finance required actions.
 - b. Require mitigation measures to reduce potential damage caused by ground failure for sites determined to have potential for liquefaction. Such measures shall apply to critical facilities, utilities, and large commercial and industrial projects as a condition of project approval.
 - c. Require that planned lifeline utilities, as a condition of project approval, be designed, located, structurally upgraded, fit with safety shutoff valves, be designed for easy maintenance, and have redundant back up lines where unstable slopes, earth cracks, active faults, or areas of liquefaction cannot be avoided.
 - d. Review proposed uses of fault setback areas closely to ensure that County infrastructure (roads, utilities, drains) are not unduly placed at risk by the developer. Insurance, bonding, or compensation plans should be used to compensate the County for the potential costs of repair.
- S 7.8 Promote strengthening of planned and existing utilities and lifelines, the retrofit and rehabilitation of existing weak structures, and the relocation of certain critical facilities.
- S 7.9 Find alternatives that improve site safety for the protection of critical facilities. Property acquisition for open space, change in building use or occupancy, or other appropriate measures can be employed to reduce risks posed by hazards. (AI 101)
- S 7.10 Discourage development of critical facilities that are proposed in dam failure inundation areas, and apply hazardous materials safety guidelines within such zones.



S 7.11 Coordinate with the Public Utilities Commission (PUC) and/or utilize the Capital Improvement Program, to strengthen, relocate, or take other appropriate measures to safeguard high-voltage lines, water, sewer, natural gas and petroleum pipelines, and trunk electrical and telephone conduits that (AI 4):

- extend through areas of high liquefaction potential;
- cross active faults; or
- traverse earth cracks or landslides.

S 7.12 Require extra design considerations for lifelines across subsidence areas.

Earthquake Response System

Half of the magnitude 5.0 and greater earthquakes in California are preceded by immediate foreshocks (earthquakes within 72 hours and 10 kilometers of their mainshock). In 1991, using this information, a group of scientists developed an earthquake preparation system based on anomalous earthquake activity along the southern San Andreas fault. This system could be adapted by the County of Riverside to respond to short-term increases in hazard from the San Andreas fault.

Certainly, thoughtfulness and care must be exercised to construct a system that will enhance public safety without promoting rumors or fear. Also, the system must not be a substitute for long-term mitigation efforts. Such potential difficulties do not reduce the usefulness of short-term, pre-event response plans. Over time, new data and additional research should allow similar systems to be developed for other major southern California faults.



State Seismic Hazard Zones:

The Alquist-Priolo

Earthquake Fault Hazards Zones Act addresses only the hazard of surface fault rupture - a phenomenon that only accounts for a relatively small percentage of earthquake losses.

The Seismic Hazards Mapping Act was enacted to address the other 95% of earthquake losses. This Act requires the State Geologist to: 1) compile maps identifying seismic hazard zones, for protecting the public health and safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure and other seismic hazards caused by earthquakes; 2) submit these maps to all affected cities, counties, state agencies, and the State Mining and Geology Board for review; and 3) provide official maps to affected cities, counties, and state agencies.

For additional information regarding Seismic Hazard Zones, please visit the Division of Mines & Geology at: <http://www.consvr.ca.gov/dmg/>.

Policies:

S 7.13 Develop a system to respond to short-term increases in hazard on the southern San Andreas fault, based on probabilities associated with foreshocks. (AI 85)

Emergency Evacuation

The State of California Government Code Section 65302 (g) requires local governments to assess the potential impact that flooding, and failure of dams or other water retention structures, might have on their jurisdiction. Safety Elements of General Plans must assess the impact of flooding from storm activity such as a 100-year flood event. A 100-year flood event is a flood that has a 1/100 chance of occurring in any one year, and a 26% chance of occurring during a typical 30 year home mortgage. Smaller-scale flooding generally associated with overburdened storm drain and canal systems can damage property and hinder emergency activities such as fire department access or evacuation.

Policies:

S 7.14 Regularly review and clarify emergency evacuation plans for dam failure, inundation, fire and hazardous materials releases. (AI 88)