

1.7 Vulnerability of the Built Environment to Earthquake Hazards

This section assesses the earthquake vulnerability of structures and facilities common in the County of Riverside, as well as the status of existing earthquake hazard mitigation programs, including code and ordinance adoption and enforcement. This analysis is based on past earthquake performance of similar types of buildings in the U.S. Beyond the scope of this study are the effects of design earthquakes on particular structures within the County of Riverside. However, utilizing a recent standardized methodology developed for the Federal Emergency Management Agency (FEMA), general estimates of losses are provided in Section 1.8 of this report.

Although it is not possible to prevent earthquakes from occurring, their destructive effects can be minimized. 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.

With these goals in mind, the State Legislature passed Senate Bill 547, addressing the identification and seismic upgrade of Unreinforced Masonry (URM) buildings. In addition, the law encourages identification and mitigation of seismic hazards associated with other types of potentially hazardous buildings, including pre-1971 concrete tilt-ups, soft-stories, mobile homes, and pre-1940 homes.

The County of Riverside's building stock is predominantly modern, and modern buildings do save lives. However, economic losses associated with structural and non-structural damage, loss of contents and repairs can be tremendous. For example, the losses associated with the Northridge earthquake approached \$30 billion.

As discussed earlier, various geologic phenomena can be triggered by earthquakes to cause loss of life and property damage. Earthquakes can also cause localized, equally destructive hazards such as urban fires, dam failures, and toxic chemical releases. During the 1994 Northridge earthquake, many mobile homes shifted or fell off their foundations, which ruptured gas lines and started fires. This type of hazard is intensified by the relatively high density of homes within mobile home parks.

1.7.1 Potentially Hazardous Buildings and Structures

Most of the loss of life and injuries due to an earthquake are related to the collapse of hazardous buildings and structures. FEMA (1985) defines a hazardous building as "any inadequately earthquake resistant building, located in a seismically active area, that presents a potential for life loss or serious injury when a damaging earthquake occurs". Building codes have generally been made more stringent following damaging earthquakes. However, pre-existing structures in the County