

1.7.3 Lifelines

Critical facilities, designed to remain functional during and immediately after an earthquake, may provide only limited services if lifelines are disrupted. Our understanding of the seismic hazards to new and existing lifeline facilities relies on several workshops and publications dedicated to the subject, including research completed as a result of the 1989 Loma Prieta earthquake. The issue of seismic hazard mitigation for lifelines is very complex, given the diversity of lifeline facilities. The general comments on the effect of strong ground motion to buildings apply to structures involved in lifeline service, such as the control tower in an airport, or the buildings that house the computers and telephone circuits that are central to communication 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. Freeway interchanges and bridges have been damaged by strong ground motions; certain bridge designs have been prioritized in retrofitting programs because of their poor past performance in regions of seismic activity.

A hazard analysis should focus on four lifeline categories: (1) water and sewer facilities, (2) transportation facilities, (3) electric power facilities, and (4) gas and liquid fuel lines. Retrofit and upgrading programs for lifelines generally require careful planning to ensure that the public is not inconvenienced by irregular or discontinued service. To implement an effective mitigation program, potential problem spots must be identified and prioritized in the extensive systems of cable and pipe used to distribute electrical energy, gas, telephone communications, and water, or to collect sewer and storm drain water.

Figures 1-22 through 1-24 illustrate the County's inventory of airports, highways, and rail facilities, as well as available data on water, oil and natural gas pipelines, in relation to the general ground shaking risk.

Figure 1-22: Airport Inventory and General Ground Shaking Risk

Figure 1-23: Highway Inventory and General Ground Shaking Risk

Figure 1-24: Rail Facilities, Available Water, Oil and Natural Gas Pipeline Inventory Data