Abstract

Earthquakes have produced losses of over $60 billion since 1971. Of these, California has suffered the highest losses nationally. These losses include building and bridge damage, destruction of building contents and business interruption. The risk factors (as they pertain to loss from earthquake damage) are large stocks of old buildings and bridges; many high-tech and hazardous materials facilities; extensive sewer, water, and natural gas pipelines; earth dams; petroleum pipelines; other critical facilities; and private property. The secondary earthquake hazards (which include liquefaction, ground shaking, amplification, and earthquake-induced landslides) can be just as devastating as the earthquake itself. Damage caused by an earthquake depends on the quality of the buildings' construction, the density of the area, the pattern of intense shaking, and many other factors. Should an earthquake occur in a densely populated area with older buildings, loss of life and damage to infrastructure would be much higher.

This study performs and evaluates two potential earthquake scenarios for the City of Downey utilizing the Federal Emergency Management Agency (FEMA) HAZards U.S., Multi-Hazard (HAZUS) Earthquake Model. According to the Downey General Plan, there is a 50% probability that a major earthquake will occur within the next 30 years along the Whittier-Elsinore Fault, which is 40 miles northeast of Downey. In addition, the Anaheim, Puente Hills, Elysian and Newport-Inglewood Faults are within or near Downey's city limit and those faults are all active or potentially active faults. For this reason, the Whittier and Puente Hills faults with Magnitude (M) 6.8 and 7.0 respectively were chosen to run in the scenarios. HAZUS, which runs on an ArcGIS platform, along with Comprehensive Data Management System (CDMS) was used to ingest updated data, model the earthquakes and create output maps. Essential Facilities data were updated via data provided from the City of Downey Water Work Department into the CDMS. United States Geological Survey (USGS) ShakeMaps were ingested via the