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Report on Seattle Fault Zone Calls for Tougher Infrastructure

By Mark Fitzgerald

According to a recent report, a magnitude 6.7 temblor on the 48 km fault that stretches across Puget Sound and through the southern part of Seattle, skirting the northern edge of Vashon Island, could be up to eight times more devastating than the Nisqually earthquake, which shook the central Puget Sound region on February 28, 2001, crippling nearly 300,000 households and causing about \$2 billion worth of damage. Although that earthquake had a magnitude of 6.8, the surface effect was somewhat muted because the quake originated deep underground. The report, the most comprehensive earthquake scenario ever drawn up in the United States, took three years and the expertise of dozens of local engineers, scientists, and emergency managers to complete.

“A scenario is really trying to look forward at something which may happen,” explains ASCE member Gregory MacRae, Ph.D., P.E., an associate professor in the University of Washington’s civil and environmental engineering department. “So it’s a guess; it’s not the answer. It’s very much subjective, but it’s also considered to be realistic because it’s been put together by experts in the field—a group of people who were probably the most qualified to talk about it.” Initiated and partially funded by the Earthquake Engineering Research Institute (a nonprofit technical society of engineers, geoscientists, architects, planners, public officials, and social scientists that seeks to reduce earthquake risk and learn more about the effects of earthquakes), the report is primarily addressed to planners on the local and state level, that is, people who influence decisions on upgrades to highways, buildings, and other facets of infrastructure vulnerable to earthquakes.

“The scenario has tried to incorporate things that a planner can relate to,” adds MacRae. “For instance, if the fault goes beneath a bridge and the shaking is strong, then that bridge could be down for about a year. We also looked at the impact this earthquake could have on various structures, especially those that serve essential purposes, such as emergency management centers and police, fire, and school buildings.” Using a computer model called HAZUS, a risk assessment program for analyzing potential losses from floods, hurricane winds, and earthquakes, the members of the team that produced the report estimated that the monetary loss resulting from a 6.7 event on Seattle’s fault line would probably exceed \$30 billion—on a par with the amount of property damage sustained in the Northridge earthquake, which struck Southern California in 1994 and is the country’s costliest natural disaster on record.

Although the last earthquake along the Seattle fault occurred about 1,100 years ago, geologists estimate that there is at least a 5 percent chance the fault will wreak havoc within the next 50 years. In addition to developing a “call to action” plan, which prioritized vulnerable facets of infrastructure, for example, hospitals and schools, the report recommends that the State of Washington establish an independent seismic safety board that would report directly to the governor and work to advance earthquake preparedness.

“The commission will need to have the clout to gather the information it needs,” predicts MacRae. “It will have to disseminate information to businesses and other groups based on best practices; it will have to develop tools so that the companies will know how to deal with what is really a low-probability but also a high-impact event.”