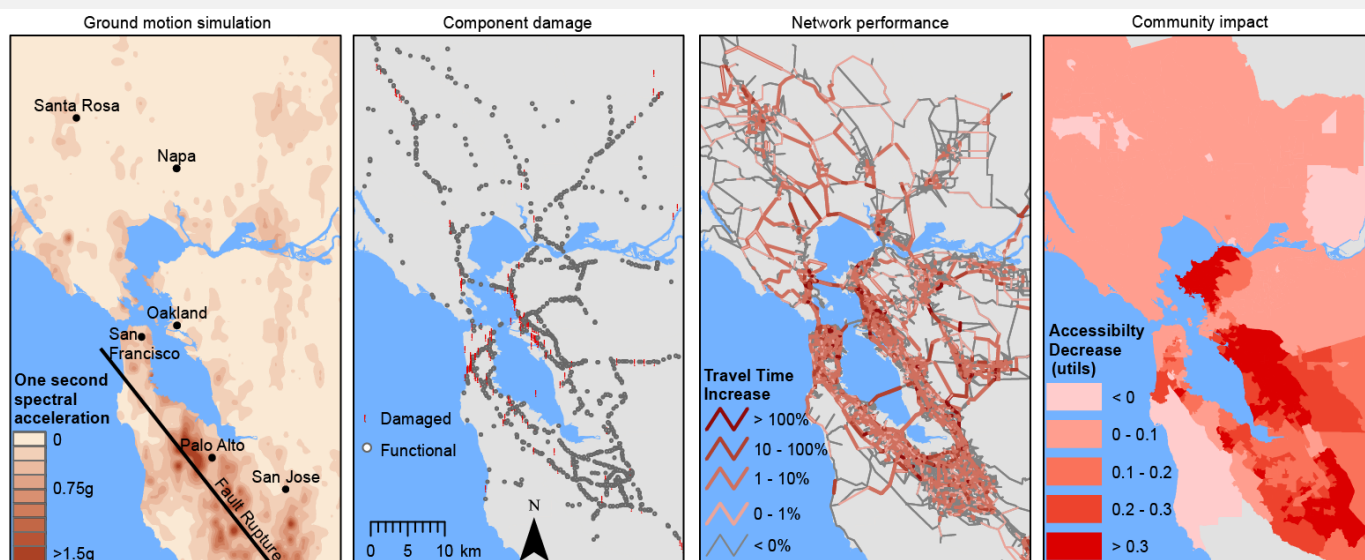


Quantifying seismic risk to transportation networks: user impacts and at-risk communities

Dienstag, 10. März 2015
17:00 Uhr
Auditorium HIL E 1 (Lehrgebäude Bauwesen)
ETH Zürich, Hönggerberg, 8093 Zürich

Jack W. Baker
Prof.
Stanford University
Stanford, USA



This talk presents a study of seismic risk to a complex transportation system, with the goal of quantifying impacts on users of the network and identifying communities that are disproportionately impacted by disruptions. The San Francisco Bay Area transportation system is considered as a case study. The network serves seven million residents and consists of 32,858 road segments, 3152 bridges subject to damage, and 43 transit modes. A refined model of this network's performance under damage, incorporating features such as transportation mode choice and dynamic demand, is used to predict disruption. Disruption is caused by earthquake shaking, where a full suite of earthquake scenarios in the region (with associated occurrence rates) are considered in order to obtain a fully probabilistic description of risk. Several strategies to manage the computational cost of this analysis are discussed. Then a number of disruption metrics are presented to provide insight into the disruption risks faced by residents of the region. Mode-destination accessibility, a performance metric of interest to urban planners, is used to evaluate the potential disruption to individual users of the transportation system. By linking models for seismic hazards, engineering performance of bridges, and resulting user impacts, we are able to translate engineering knowledge into metrics that are usable by urban planners responsible for long-term management of the transportation system's risk.

Nächster Vortrag: Dienstag, 31. März 2015, 17:00 Uhr, HIL E 1
Stéphane Braune, Dipl. Bauingenieur ETH/SIA

"Das neue Coop Verteilzentrum in Schafisheim: Aussergewöhnliche Tragwerke für ein aussergewöhnliches Bauwerk"