Linking building properties and damage to earthquake-induced business' downtime

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Project Abstract:

This project will contribute to a better understanding and modelling of earthquake-induced business' downtime. Current formulas for predicting earthquake-induced business' downtime are mainly expert based and lack validation and benchmarking against real-world experiences. Because of that the estimation of the expected business' downtime following earthquake, as part of "Performance-based" approaches and/or losses and risk assessment platforms, is very likely missing a number of important factors related to sector specific organizational decisions and capabilities. Leveraging unprecedented high quality data availability on both business interruption and physical damage to premises following the Canterbury earthquake sequence 2010-2011, this project will identify key predictors of business interruption, by sector, and will assess the threshold values that constrain the capabilities of organisations to keep operating from impacted premises. The focus will be on multi-storey concrete buildings and on the analysis of physical damage to the buildings and contents, keeping in mind the influence of other factors known to be important to business interruptions (e.g., infrastructure damage, cordons). This project aims to close a key knowledge gap by developing relationships between the type of building an organisation is operating from (e.g. structural system, material, number of stories, construction type), the nature and extent of damage that building sustains in an earthquake, and how that damage translates into business disruption impacts for occupant organisations, of different sectors. These relationships will provide key inputs for analysis tools such as RiskScape and MERIT (within the Economics of Resilient Infrastructure Project) and will provide important interfaces between community datasets for evaluating the seismic vulnerability of current building stock and the expected socio-economic impacts in the event of an earthquake event.