Creating GIS-ready Building Inventory Dataset for Seismic Risk Assessment and Management

Building inventory database is created for Wellington, whose ultimate aim is to assist the generation of research on the risks, impacts, and viable solutions for reducing the seismic risk of existing multi-story concrete buildings in Wellington’s CBD. The inventory being constructed is embedded within a GIS viewer that will allow approved users access and visualise information directly on the viewer or to query and extract parts of the data inventory to suit research needs.

Building specific information contains spatial, structural, non-structural, occupancy, and ownership details.

Multiple datasets are being sourced and combined in order to fill the gaps in the building inventory. Each dataset was originally created to address specific need (e.g. EQ-prone assessments). Therefore, there are significant variations in the attributes, terminology, representation of buildings, currentness.

This project will provide fundamental research on risks, impacts, and solutions for multi-storey existing buildings in Wellington CBD, with a particular focus on buildings generally of concrete construction. Wellington property market will likely be heavily impacted by new seismic assessment guidelines due with many new assessments are likely to fall below 67%. Furthermore, densification of the CBD with 50,000 new residents in the next 20 years will result in conversion of many older commercial building stock to housing with a change in the risk profile for the city.

This project aims to provide best scientific knowledge about the expected seismic performance of concrete buildings (B,C), the impact of multiple building failures including the downstream consequences of associated cordoning (D), combined with innovative ideas regarding prioritization of retrofits (E) and optimised regulatory structure (F) to address the risk from earthquake vulnerable concrete buildings.

(A) BUILDING INVENTORY

(B) Vulnerability of concrete building components – nonductile columns and precast floors

(C) Modeling of existing concrete buildings to assess collapse risk

(D) Cordonning and associated impacts

(E) Prioritisation of strengthening or demolitions of earthquake-vulnerable buildings

(F) Regulatory solutions for addressing earthquake-vulnerable buildings