

# Deliverable

## D4.1: Exposure and vulnerability models for RLA service for Europe (Demonstrator)

| Deliverable information    |   |
|----------------------------|---|
| <b>Work package</b>        | WP4. Effects: Advancing loss and resilience assessment for earthquake early warning and operational earthquake loss forecasting |
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## Summary

D4.1 is a demonstrator deliverable that constitutes a set of pan-European exposure and vulnerability models for the calculation of Rapid Earthquake Loss Assessment (RELA). This document therefore simply describes where the models can be publicly accessed, and the associated license and citation details. The details behind the development of these models are provided in the deliverable D4.2.

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## 1. Access to data and models

### 1.1 Exposure models

Data to develop exposure models for a total of 44 countries have been collected and have been publicly released at the following GitLab repository: [https://gitlab.seismo.ethz.ch/efehr/esrm20\\_exposure](https://gitlab.seismo.ethz.ch/efehr/esrm20_exposure)

The final exposure models have been formatted in the OpenQuake-engine NRML format for Rapid Earthquake Loss Assessment and they can be accessed here: <https://gitlab.seismo.ethz.ch/efehr/esrm20/-/tree/main/Exposure>

### 1.2 Vulnerability models

Data and software to develop vulnerability models for a total of 511 building classes have been publicly released at the following GitLab repository: [https://gitlab.seismo.ethz.ch/efehr/esrm20\\_vulnerability](https://gitlab.seismo.ethz.ch/efehr/esrm20_vulnerability)

The final vulnerability models (for economic loss and loss of life) have been formatted in the OpenQuake-engine NRML format for Rapid Earthquake Loss Assessment and they can be accessed here: <https://gitlab.seismo.ethz.ch/efehr/esrm20/-/tree/main/Vulnerability>

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## 2. Citation, DOI, License etc.

The GitLab repositories described in the previous section have been mirrored to GitHub and then releases for each version have been published on the RISE project Zenodo community page (<https://zenodo.org/communities/rise-h2020/?page=1&size=20>) and DOI's have been assigned by Zenodo.

The exposure model data repository is available here: <https://zenodo.org/record/5730071#.Yve2pMFBzt0>. The latest version of this repository can be cited as follows:

H. Crowley, V. Despotaki, D. Rodrigues, V. Silva, C. Costa, D. Toma-Danila, E. Riga, A. Karatzetzou, S. Fotopoulou, L. Sousa, S. Ozcebe, P. Gamba, J. Dabbeek, X. Romão, N. Pereira, J.M. Castro, J. Daniell, E. Velu, H. Bilgin, ... U. Hancilar. (2021). European Expo-sure Model Data Repository (v1.0) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.5730071>

The building vulnerability data repository is available here: <https://zenodo.org/record/5639318#.Yve20MFBzt0>. The latest version of this repository can be cited as follows:

X. Romão, N. Pereira, J.M. Castro, H. Crowley, V. Silva, L. Martins, & F. De Maio. (2021). European Building Vulnerability Data Repository (v2.1) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.5639318>

All of the data and models have been released with a Creative Commons Attribution 4.0 International License. To view a copy of this license visit <http://creativecommons.org/licenses/by/4.0/>.

**Liability Claim**

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