

# ***Interactive comment on “Mapping Accessibility for Earthquake Hazard Response in the Historic Urban Center of Bucharest” by Cristina Merciu et al.***

## **Anonymous Referee #1**

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### Abstract

The abstract summarises well the article. The aim is clear from the title and the abstract.

### Background

The paper has a clear research question on accessibility in case of emergency after earthquake in a mixed street pattern city centre. To previous studies, either known by the author or referenced the paper adds a new case study in a city less covered by literature. Compared to the previous version, the references improved. However, technical correction to Crowley, H., Colombi, M., Pinho, R., Meroni, F., and Cassera,

A.: Application of a prioritisation scheme for seismic intervention in school buildings in Italy, in: 14th World Conf. Earthq. Eng., Beijing, China. Although the WCEE papers are archived in the web, there is a better referenceable paper by the authors in Earthquake Spectra (Damian N. Grant, Julian J. Bommer, Rui Pinho, G. Michele Calvi, Agostino Goretti, and Fabrizio Meroni (2007) A Prioritization Scheme for Seismic Intervention in School Buildings in Italy. Earthquake Spectra: May 2007, Vol. 23, No. 2, pp. 291-314.)

### Methodology

The paper develops a methodology to deal with GIS tools for the case study of Bucharest. Bucharest is a large city in Europe (2 Mio. inhabitants) posing seismic risk. At the same time, since more than 40 years passed since the last damaging earthquake, awareness to seismic risk decreased. Many high seismic risk buildings, though identified, are not being retrofitted, which would lead to loss in an earthquake. This is what the paper focuses on: the emergency planning in case that an earthquake would occur. In this sense it is helpful to civil protection. The paper improved compared to the last version in the explanation of fire risk. The density of high seismic risk buildings in the historic centre compared to the Magheru boulevard (where high density reinforced concrete buildings are posed to hazard) has been properly highlighted with corresponding maps.

### Data and Results

The study matches the results as presented briefly in the abstract. The paper properly underlines the study results with a table and graphs. Fig. 10 presents a relevant result with blocked street from the collapse of high density vulnerable buildings in the historic centre. Although historic earthquakes lay so long back, the paper properly includes recent events which raised awareness on hazards, such as the Colectiv fire, hence the inclusion of fire hazard is important.

As results, there are useful recommendations for decision makers, which build properly on the civil protection studies from Italy which were mentioned, and

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also on the reference to Schweier and Markus who collaborated on emergency issues with the Romanian civil protection. This is a reason I propose it for highlight. The Frank Fiedrich article I suggested within the same collaboration is for example <http://ieeexplore.ieee.org/abstract/document/4117644/?reload=true> or <https://www.informs-sim.org/wsc06papers/059.pdf> which included simulation of post-earthquake fire for Magheru boulevard in Bucharest. More recent writings addressing urban infrastructure such as roads by the author are Urban Disaster Resilience and Security. Addressing Risks in Societies. Editors Alexander Fekete Frank Fiedrich (Springer) and Einführung in den Bevölkerungsschutz. Autoren: Fiedrich, Frank, Kudlacek, Dominic (Springer), the second might be more difficult to understand as it is in German but it means "Introduction to population protection".

The maps have a better visibility in 2D as in 3D in the initial article after the consideration of the reviewer.

In addition to the letter of the authors we note that also the main author, although initially included, changed and was responsible to set up the maps.

In summary the article improved and took in consideration the observations from the previous revision (there was answer to the reviewer comments, also considering some of the comments for a future study) and I recommend it for publication. I think that it is especially relevant for the civil protection involvement in emergency planning, which is one of the four planning models in disaster management, if preparedness planning was incompletely approached as it is the case in Bucharest, and mitigation and resilience planning are not yet mature. The European Commission has special funding programmes for civil protection involvement in disaster management. I recommend only technical corrections regarding the references.

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