

## PHYSICAL PLANNING IN SEISMIC REGIONS

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### Introduction

Large scale destruction caused by the effects of disastrous earthquakes in areas with high seismic activity indicates the necessity for undertaking corresponding protective measures for the purpose of reducing destruction to the lowest possible level. This is especially the case because of the possibility earthquakes can affect large urban areas. With the permanent development of urban areas and consequent construction of a large number of structures requiring significant expenditures (energy, transportation, industrial and other structures) responsible authorities more and more face the requirement to protect such large investments from the destructive effect of earthquakes as much as possible.

Earthquake destruction has provided the motivation for detailed investigations of earthquake effects upon buildings and civil engineering structures as well as infrastructure systems with the basic aim of undertaking corresponding protective measures, depending on the economic and technical power of the country involved. The implementation of technical regulations for design and construction in seismic areas is the basic protective measure which provides the required resistance of the structures against earthquakes.

The implementation of protective measures against destructive earthquake effects upon structures is much more effective than mitigation of other direct or indirect consequences of earthquakes. The present level of knowledge and techniques enables effective implementation of protective measures against the destructive effect of earthquakes upon structures through the methodology of physical planning and urban design in earthquake prone areas. The physical and urban planning for seismic areas is a young discipline. It has evolved for the most part, since the disastrous earthquake of Skopje in 1963, i.e. with the development of the General Urban Plan of Skopje.

The protective measures against disastrous earthquakes through physical planning and urban design in seismic areas are carried out, mainly, through the following basic methodological elements:

- determination of land-use zones for location of urban areas (towns, industrial complexes and other settlements),