

BOX 2

STRATEGIC URBAN STRUCTURE (SUM) Concept, components, phases and references

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The Strategic Urban Structure (SUM) has been introduced within the Law of Umbria Region 11/05 (Art. 3) as a fundamental tool to reduce urban seismic risk through planning. Its definition is provided by the Guidelines with the same title (SUM)¹, addressed to technicians working within Public Administrations at the local level, as well as to planners and urban designers. The SUM refers to the basic system of streets, open spaces, strategic functions and buildings whose contribution is fundamental for responding to the earthquake in the emergency phase and for the re-start of socio-economic and urban activities after a seismic event. The SUM includes the basic components, none of which can be subtracted without compromising the functioning of the settlement.

The SUM can be considered as analytical and also as a planning tool. In fact, aiming at improving the “urban response” to the earthquake, it is grounded on the present condition of places, but it considers also planning forecasts,

¹ See references.

defining what is needed in terms of spaces and places, functions and routes, in order to increase its efficiency. From a planning point of view, the re-start of the city after a seismic event is as important as the ability to resist the earthquake in the emergency phase: for this reason, the SUM is composed of strategic elements that can fulfil both purposes. It also highlights the criticalities that must be solved to ensure a better functioning of a town in case of a seismic event and therefore it is useful for defining public actions, and priority actions. It is important to clarify that the SUM does not only include the contents of a Civil Protection Plan, but it contains all the elements that are necessary for the functioning of the city both in the emergency and post-emergency phases.

Defining the SUM

The definition of the SUM is addressed to the reduction of seismic risk and consists of three steps that correspond to three basic planning stages:

1. Identifying urban structure through analysis of the urban functioning and identification of its strategic components for the response to an earthquake. This includes both the present elements and those foreseen by planning tools. The main systemic components of the urban structure are:
 - mobility and accessibility (the main transport and communications network, the main connections between strategic functions, etc.);
 - safe open spaces;
 - strategic buildings (administrative institutions, health facilities, police, fire department, etc);
 - main technological networks.

The SUM also includes buildings and places that contribute to the representation of economic, social and identity values. Their loss may affect the functioning of the city, and particularly the post-seismic restart.

2. Assessing criticalities through the identification and evaluation of potential problems and weaknesses of strategic components of the SUM. The evaluation consists, first of all, in a qualitative

assessment. Further in-depth assessments can be conducted according to different levels of detail which are needed, and according to the knowledge and resources available. The evaluation regards the main following critical issues:

- structural damage;
 - absence or lack of safe spaces;
 - absence or lack of safe routes, considering in particular situations of overcrowding;
 - local seismic hazard conditions;
 - amplification of the seismic effects, in particular when the damage of a single element leads to a systemic loss of functionality;
 - potential problems with communications;
 - general systemic weakness.
3. Definition of the actions needed to reduce criticalities and to increase the functionality of the SUM. These actions should be consistent with planning needs, and also consistent and integrated with the operational needs of civil protection. Specifically interventions concern:
- reduction of the weaknesses of the systems;
 - improvement of the urban structure with the definition of alternatives, or with the creation of elements of redundancy;
 - definition of new planning goals more consistent with environmental risk reduction imperatives.

Improving the functionality of the SUM could mean providing the redundancy of some of its elements. There are two main reasons why the SUM must be characterized by redundancy, both related to forms of uncertainty. The first is uncertainty about possible concatenations or side-effects provoked by the seismic event, and to the multiple situations which could occur; the second is uncertainty about the behaviour of the urban settlement (which is also related to human behaviour).

PHASES	DEFINITION OF THE SUM interpretation of the settlement's structure	ASSESSMENT OF SUM's CRITICALITIES identification of systemic critical factors / issues	INCREASING OF THE FUNCTIONALITY of SUM definition of the actions and interventions addressed at increasing efficiency and resilience
PRODUCTS	cartographies and plans - also through diagrammatic representation - in order to define the SUM	cartographies and plans to identify critical elements or factors (also through diagrammatic representation)	cartographies and plans to define and localize actions and intervention (also through diagrammatic representation)

Table 1 - The phases and related products for the definition of the SUM

REFERENCES

Regione Umbria – DPTU, Dipartimento di Pianificazione Territoriale e Urbanistica, Sapienza Università di Roma: F. Fazio, M. Olivieri, R. Parotto, B. Pizzo (2009), *Linee guida per la definizione della Struttura urbana minima all'interno del Prg* – parte strutturale. Law 11/05 (Art. 3) of Umbria Region Rules of local government: municipal planning.