



## **3D Visualization of Transformation in Historic Townscape: Case of Zeyrek Urban Site**

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Townscape as the main theme of this paper can be defined as physical environment that is perceived on the third dimension of urban space. Term of townscape expresses not only the actual composition of urban landscape, environment and sense of place but also the comprehensive definition of the change in the built environment. Representation of the change in townscape is significantly important throughout the urban planning process in order to gain better comprehension regarding urban transformation. Then innovative visualization and representation tools may facilitate to accomplish this comprehension in third dimension.

Because of its historical, aesthetical and architectural characteristics, the case area, Zeyrek, was included in the World Heritage List in 1983, as a conservation site in Istanbul Historical Peninsula. While recent conservation studies and interventions in the site indicated a significant change in urban historic characteristics, motivation of this paper was based on the capability of different representation techniques in definition of transformation in site's townscape. This representation was conducted with the utilization of two-dimensional (2D) conventional mapping and three-dimensional (3D) urban model, generated by means of historic documents, images and inventories to define the change in townscape. This study evaluated this transformation in historic townscape of Zeyrek within the period between 1933 and 2008 with the utilization of both representation techniques.

In order to investigate the capability of visualization techniques, 2D conventional mapping technique and 3D urban model were compared regarding the representation ability of this transformation. A questionnaire study was also conducted to gather the responses from the users, respectively graduate students in Faculty of Architecture, professions in planning and conservation institutions, high school students in the site as the representatives of inhabitants. Users' responses were investigated and assessed in quantitative methods with descriptive statistics in order to measure how efficiently the change in historic townscape was perceived and comprehended by means of both visualization techniques.

As the fundamental finding of the study, it was concluded that the transformation in historic townscape was better defined in 3D urban model than 2D conventional mapping technique. When comparing the representation capability of both visualization techniques, 3D urban model had also higher scores in the other variables but the most prominently in comprehension of general characteristics of the site, orientation sense of users. When comparing the users' responses in the groups of professions and non-professions, distinctive findings were also indicated. Especially professional user group paid attention to the technical attributes of 3D urban model associated with representation capability of spatial content involving townscape characteristics. On the contrary, high school students stated learning, comprehension and cognition attribute of 3D urban model as the most important attribute in the efficiency of visualization technique.

In conclusion, as an innovative tool in urban planning, 3D urban model improved the user's cognition regarding the representation of transformation in historic townscape and enhanced the communication and interaction of spatial information among different user groups.

**KEY WORDS:** Urban transformation, historic townscape, 3D visualization.