

## Building an Arithmetic Model to Assess Visual Consistency in Townscape

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**Abstract :** The phenomenon of visual disorder is prominent in contemporary townscapes. This paper provides a theoretical framework for the assessment of visual consistency in townscape in order to achieve more favourable outcomes for users. In this paper, visual consistency refers to the amount of similarity between adjacent components of townscape. The paper investigates parameters which relate to visual consistency in townscape, explores the relationships between them and highlights their significance. The paper uses arithmetic methods from outside the domain of urban design to enable the establishment of an objective approach of assessment which considers subjective indicators including users' preferences. These methods involve the standard of deviation, colour distance and the distance between points. The paper identifies urban space as a key representative of the visual parameters of townscape. It focuses on its two components, geometry and colour in the evaluation of the visual consistency of townscape. Accordingly, this article proposes four measurements. The first quantifies the number of vertices, which are points in the three-dimensional space that are connected, by lines, to represent the appearance of elements. The second evaluates the visual surroundings of urban space through assessing the location of their vertices. The last two measurements calculate the visual similarity in both vertices and colour in townscape by the calculation of their variation using methods including standard of deviation and colour difference. The proposed quantitative assessment is based on users' preferences towards these measurements. The paper offers a theoretical basis for a practical tool which can alter the current understanding of architectural form and its application in urban space. This tool is currently under development. The proposed method underpins expert subjective assessment and permits the establishment of a unified framework which adds to creativity by the achievement of a higher level of consistency and satisfaction among the citizens of evolving townscapes.

**Keywords :** townscape, urban design, visual assessment, visual consistency

**Conference Title :** ICURPT 2016 : International Conference on Urban, Regional Planning and Transportation

**Conference Location :** Boston, United States

**Conference Dates :** April 25-26, 2016