Visual Impact Assessment for Infrastructure Design

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Abstract

The following paper illustrates the verification of methodologies employed by international agencies to assess the *Scenic Quality* of a landscape. Several States determine a landscape's *visual quality* using predictor variables. This research aims to validate the recognized ability of these predictor variables to reproduce untrained observers' preferences. Three variables have been chosen to analyze a series of Italian landscapes: *Vividness*, *Intactness* and *Unity*. Photographic inventories were created for different landscapes. Pools of landscape architects judged the slides associated to each landscape using a 7-point scale. Identical slides were then shown to untrained observers composed of 201 students that used a 10-point scale to evaluate *Scenic Beauty* for each picture. Students' judgments were then related to the expert judgments using a regression analysis. Road evaluation from the landscape will be a future application using simulation or rendering techniques.

Keywords*:* highways; visual quality; scenic beauty.

1. Problem statement

The design of new roadway infrastructures contains significant meaning not only in terms of the functional and safety improvement of the network but also regarding to the socio-economic development of a territory beyond regional barriers. This process is obliged in every case to mitigate and reduce any negative impact on the community. Today the roadway design features are mostly subject to the judgments and decisions of designers that often don't have the instruments to accurately estimate nor verify the effective output related to their decisions until the project is finished. In many countries attributing to context-sensitive road design is not new, as it is in Italy, but a recognized procedure exists. Some methods have been developed to examine roadway-landscape interaction while several other procedures related to landscape assessment from the road and assessment of road from the landscape have been produced. Many States and Federal Agencies in the US have adopted scenic highway programs or programs with elements analogous to scenic-based planning. Generally, each one applies an expert-based methodology, using descriptors to formulate statements of *Visual Quality*. These predictor indicators interpret, with adequate accuracy, the predilections of a community, if it was possible to get information from the community. Public participation is an important component of most programs, and the preferences expressed by the community give an impression of how the public perceive *Scenic Beauty*.

This study illustrates the application of two methods applied in the international literature, though with a specific reference to the Italian context. The analysis will demonstrate the capacity of a number of predictor indicators to correctly interpret public preferences.

2. Literature review

Infrastructure development must always ensure minimization of project costs and times, but at the same time, maximization of social and economic benefits reducing negative impact on the community. The comparison between a method using only an expert pool's judgment and that of untrained observers of a landscape was previously conducted by Clay and Smidt [1] in 2003 along a road corridor in California's Central Coast region. Results indicated that *Vividness* and *Variety* were significant for preference but the contribution of *Variety* was however limited, and it did not supply

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