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Evaluation and selection of alternatives for the promotion of sustainable urban mobility

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Abstract

This study aims at the adjustment and application of a strategy to assess and select alternatives for improving the mobility conditions of a city. The approach was tested in the city of Itajubá, MG, Brazil, as follows: i) assessment of the current conditions, as given by the Index of Sustainable Urban Mobility, and ii) application of a strategy designed to indicate alternatives for the improvement of the mobility conditions in a sustainable way. The overall value of the index in Itajubá was 0.452, in a scale varying from zero to one. The comparison of this value with the results of reference cities, such as Curitiba (0.754) and Uberlândia (0.714), indicates an important difference. However, the approach seems to indicate lines of action for the improvement of mobility, given that it allows a fast identification of positive or negative points raised by the experts. Based on the results obtained, it can be assumed that the level, activity or profession of the participant will influence the results. In this case, for example, the external specialist presented a more pessimistic evaluation than the manager. Keeping in mind the viability of these responses, every change proposal must take into consideration the potential evaluator bias. It is evident that, if the number of evaluators is substantially raised, these discrepancies tend to diminish, and would also enable the analysis using mean values.

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1. Introduction

The search for sustainable development may result in options and means of intervening, or even preventing, urban planning from facing the problems which modern-day cities face. Aside from physical and economic questions, there

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are also social, environmental, political and cultural questions to be considered. Developing a greater understanding of such issues sheds light on the complexity which city planners come up against. Sustainable urban mobility encompasses all of these aspects while also tackling traditional questions in reference to transportation planning.

The Sustainable Urban Mobility Index (I_SUM) is an instrument which was conceived to help managers and urban planners evaluate mobility conditions in municipalities (Costa, 2008). It involves global characteristics and, at the same time, highlights specific points for each issue. Applying I_SUM is possible under any geographic context, easing the monitoring of management strategies. With the method's results, one can create a collection of data with mobility comparisons with other cities. Using planning based on scenarios, different forms of management (such as conservative or ambitious, as proposed by Mancini (2011) may be evaluated. This type of strategy, however, still requires improvements, mainly for the evaluation and selection of actions to be applied in real cases, which is the focus of this article.

The general objective of this study is to develop and apply a strategy to assess and select alternatives for improving urban mobility conditions in a real case study. The methodology proposed was applied in the city Itajubá, located in the southeastern Brazilian state of Minas Gerais. Branching from the general objective, the specific objectives to be met are: i) diagnosis of current mobility conditions within the city, based on I_SUM, and ii) apply a planning strategy which is capable of indicating sustainable improvement opportunities. One specific preoccupation was to assess how individuals with different profiles may affect the results generated by the proposal. In this case, the participants were professionals involved in urban or transport planning; however, they all maintained different relationships with the city.

2. Sustainable Urban Mobility

The constant search for the best way to improve sustainable urban mobility concepts generally leads to new approaches, such as the initiative to create indices which allow for an evaluation of the degree of sustainability within the city. However, there is no single, ideal method to tackle this question, but rather myriad alternatives which can be adapted to fit the needs of the area under study. City planning depends on the participation of professionals from a variety of disciplines, and many times is influenced by popular acceptance and management support. The choice of the method to be applied depends on criteria chosen for that region, being the diagnostic stage which determines the following steps to be taken. López-Lambas *et al.* (2010) explain that the assessment method should be flexible and sufficient to enable decision-makers to make necessary adjustments, as multi-criteria decision methodologies (Bana and Costa, 2001). Another promising approach is planning through indicators. Indicators are capable of generating information for decision-making processes which enable tracking and monitoring goals, benefits, efficacy and efficiency of the proposed actions (Villela *et al.,* 2007).

Urban sustainability indicators stand out from more traditional standards. Thus, instead of dealing with isolated social, economic and environmental aspects, new indicators tackle plans involving characteristics such as integration, long-term planning and a wide-spread range of actors. For a more detailed discussion about this differentiation, the studies from Segnestam (2002) and Magalhães (2004) are recommended readings. An example of an indicator with an "integrationalist" vision is the index of Sustainable Urban Mobility (I_SUM), which is a tool for evaluating urban mobility based on a multi-criteria approach (Costa, 2008).

The index of Sustainable Urban Mobility was constructed on a set of indicators which, as suggested by Litman (2009), were carefully selected to reflect the diverse impacts and perspectives of the theme mobility. The I_SUM was constructed on a set of indicators which, as suggested by Litman (2009), were carefully selected to reflect the diverse impacts and perspectives of the theme mobility. The I_SUM was developed in several stages, as described in Costa (2008) e Rodrigues da Silva et al. (2010), and summarized in the sequence. The first step was the definition of the concept of sustainable urban mobility that could be adopted in urban and transportation planning and management activities in selected Brazilian cities. The process involved the organization of several workshops with technicians, planners and decision-makers working for the public administration sector at the municipal or metropolitan level between May 2005 and November 2006. The outcome of the analyses of the aspects discussed in the eleven cities in which the workshops were organized was a list of fifty-five Alternatives. They reflected the main areas of concern regarding the issue of sustainable mobility.

The hierarchy of criteria of I_SUM started with the fifty-five Alternatives, which were defined after successive rounds of analyses, comparisons and combinations of concepts that expressed similar ideas. The final outcome of the