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Sustainable consensus? The NISTO evaluation framework to appraise sustainability and stakeholder preferences for mobility projects

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Abstract

While sustainability of transport projects is of increasing importance, the concept of sustainability can be understood in many different ways by the stakeholders that are involved in or affected by mobility projects. In this paper, we compare the outcomes of the assessment of sustainability of projects through a multi-criteria analysis (MCA) and the appraisal of stakeholder preferences through the multi-actor multi-criteria analysis (MAMCA). Evaluating projects with both tools and comparing the outcomes can provide insight into the stakeholder support of sustainable solutions and the sustainability of alternatives preferred by stakeholders. The sustainability of projects is assessed through 16 criteria grouped under the three pillars of sustainability. They were selected by in-depth review of 16 case studies of mobility projects, 18 transport evaluation schemes and the ranking of potential criteria by 214 stakeholders in North-West Europe. These criteria were weighted by 93 representatives of decision makers in the mobility domain. Stakeholder preferences were appraised through the criteria identified for each stakeholder group. We illustrate the framework by evaluating alternative solutions to improve cycling connections between the towns of Tilburg and Waalwijk in the Netherlands. The results of the comparison show that stakeholder preferences are biased towards one or two of the sustainability pillars (economy, environment, society) in three ways: through the selection of the criteria by the stakeholders, the weights of each criterion by each stakeholder group and differences in the final ranking of alternatives between the stakeholder groups and the MCA.

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1. Introduction

Sustainability in general and sustainable mobility in particular are universal concepts that are supposed to reflect the overall societal objectives in terms of economic development, environmental preservation and social progress. Sustainability, however, can be understood in many different ways by the stakeholders that are involved in or affected by mobility projects (Richardson, 2005). While an alternative to solve a particular mobility problem can be sustainable in general, it may not receive support from the majority of the stakeholders since their evaluation criteria and preferences may differ from the assessment criteria for sustainable mobility. Therefore, there is a need for evaluation frameworks and tools that can appraise project alternatives in terms of their sustainability as well as their stakeholder support.

In this paper, we propose the NISTO¹ evaluation framework that is composed of the assessment of sustainability of projects through a multi-criteria analysis (MCA) and a close integration of stakeholders into the evaluation process through the multi-actor multi-criteria analysis (MAMCA). Evaluating projects with both tools and comparing the outcomes can provide insight into the stakeholder support of sustainable solutions, or vice versa, the sustainability of alternatives preferred by different stakeholder groups. The framework has been tested through the evaluation of five demonstration projects. This paper presents the evaluation of alternative solutions to improve cycling connections between the towns of Tilburg and Walwijk in the Netherlands. Potential conflicts between the preferences of the stakeholders and the sustainability of options will be shown.

The next section gives a brief overview of the literature on the linkages between sustainability assessment and participatory evaluation. Then, in Section 3, the proposed evaluation framework is introduced. Section 4 describes the case study and section 5 presents the results. Section 6 concludes the paper by discussing the results and limitations of the study.

2. Sustainability versus participatory evaluation

The concept of sustainable transport or sustainable mobility has been derived from that of sustainability. Based on a review of sixteen planning and research projects, Jeon and Amekudzi (2005) concluded that definitions of a sustainable transport system usually cover impacts on economic development, environmental integrity and social quality of life. Similarly, a number of evaluation and indicator frameworks for transport consider at least the ‘triple bottom line’ that define sustainability: economy, environment and society (Nieto, 1997; Toth-Szabo *et al.*, 2011; Marletto and Mameli, 2012; Litman, 2013).

Sustainability assessment is based on two paradigms: the expert-led, top-down approach and the participatory bottom-up approach (Reed *et al.*, 2006). The former has the advantage that the comparison across different cities and regions is possible (Binder *et al.*, 2010). The latter, however, puts more emphasis on the local context, hence decisions may reflect local circumstances better (Reed *et al.*, 2006). Gibson (2006) suggests that traditional top-down approaches to sustainability assessment should be enhanced with effective public participation and attention to specific local concerns. The difficulty of involving different stakeholder groups in the assessment of sustainability, however, arises from the potential conflict between participation and a balanced view of sustainability. Some stakeholder groups may have objectives that are not sustainable. Car drivers, for example, may have objectives that conflict with those of pedestrians (e.g. more parking and road capacity vs. larger pedestrian areas). Therefore a balance between community and high-level control over the assessment process is needed to provide an objective assessment of impacts (Reed *et al.*, 2006). Several approaches have been proposed that combine top-down and bottom-up methods (Sheppard and

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