Habitat International 45 (2015) 82–91

Contents lists available at ScienceDirect

Habitat International

journal homepage: www.elsevier.com/locate/habitatint

Transition through dialogue: A stakeholder based decision process for cities: The case of city distribution

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ARTICLE INFO

Article history:
Available online 28 July 2014

Keywords:
Stakeholder
Evaluation framework
Freight transport

ABSTRACT

Urban areas are facing several challenges. One of them is how to organise freight transport in a sustainable way. Most of the measures that have been experienced suffer from a lack of systematic evaluation and assessment of their short and long term effects. That is why large scale or long term adoptions often fail, because not all stakeholders were taken into account (Macharis & Melo, 2011). Consequently involving these actors and their objectives is a primary focus to develop the evaluation methodology. The Multi-Actor Multi-Criteria Analysis (MAMCA) methodology suits perfectly in this aim. Within this paper, a specific evaluation framework for city distribution (CD-MAMCA) is explained with its step-by-step approach. The relevant stakeholders within urban and interurban freight transport context are shown together with their important criteria.

Introduction

Urban goods distribution plays an important role in the sustainable development of cities. It is required to replenish stocks of food and other retail goods in shops, to deliver supplies to offices and to remove household waste from urban areas (DGMOVE, 2012). However urban and inter urban freight transport also raises much problematic issues, generating negative impacts, such as congestion, pollution, traffic safety etc. In order to tackle these particular challenges in a city distribution context, technological and logistical measures including innovative concepts can be tested. Thus several cities have been trying to find and implement their own solution to the respective problem, aiming to support both their growing activities and their quality of life. One research question is how do you evaluate if a possible measure will work or not and if a possible alternative will be better than another one or not in a particular context. Indeed unexpected side-effects might occur as illustrated in the unsuccessful implementation of urban freight consolidation centres in many cities (Marcucci & Danielis, 2008). Reasons for this failure include the fact that not all the stakeholders, with their own and often conflicting objectives, were early involved in the decision process. Besides, there is a lack of systematic assessment of the effects of different measures. That is why there is a clear need for a comprehensive approach of an evaluation toolbox which is applicable to any urban freight measure within the urban and interurban context and across regions in the European Union. Consequently a new assessment framework has been developed for the evaluation of measures applied to urban-interurban transport interfaces within the STRAIGHTSOL project (Strategies and measures for smarter urban freight solutions, EC FP7). To ensure the success of the taken measures, this new framework includes multiple methodologies. Among them, a Multi-Actor Multi-Criteria Analysis (MAMCA) (Macharis, 2007) stresses the involvement of various stakeholders in the decision process, as well as on the measures' impact both on society and private sector. This paper describes the possibilities of this methodology for the evaluation and implementation of innovative ideas within the urban context.

Multi-Actor Multi-Criteria Analysis

The Multi-Actor Multi-Criteria Analysis (MAMCA) is an extension of the existing Multi-Criteria Analysis (Fandel & Spronk, 1985; Guitoni & Martel, 1998). MAMCA allows researchers and decisions-makers to evaluate different alternatives (policy measures, scenario's, technologies, etc.) with regards to the objectives of the different stakeholders that are involved in the decision making process. This way, the MAMCA explicitly includes the stakeholders in the analysis. The methodology was developed by Macharis (Macharis, 2005; Macharis, 2007) and has been used for many

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http://dx.doi.org/10.1016/j.habitatint.2014.06.026
0197-3975/

applications, mainly in transport related decision making problems (for an overview, see Macharis, de Witte, & Ampe, 2009). The MAMCA consists of two main phases (Macharis, 2005). The first phase is mainly analytical and tries to gather all the necessary information to perform the analysis. The second phase is the synthetic or exploitation phase and consists of the actual analysis. These two phases are then divided into respectively four and three steps (Macharis et al., 2009) as also depicted in Fig. 1. The 1st step is to give a clear problem definition and to determine the alternatives that need to be taken into account. In the 2nd step all the relevant stakeholders are determined as well as their objectives. These objectives are then translated into criteria in the 3rd step (see Fig. 2.). Weights need to be assigned to the different criteria in order to know how important these objectives are for the stakeholders (i.e. priorities). The 4th step links one or more measurable indicators to each criterion. These indicators allow evaluating each alternative with regards to a given criterion. These indicators can be either quantitative or qualitative, depending on the criterion. The 5th step performs the aggregation of the information of the previous steps into an evaluation matrix. The actual results are given in step 6 and are generated by using a Multi-Criteria Analysis (MCA). For each stakeholder the advantages and disadvantages are shown. The Multi-Actor new brings this all together. The 7th and last step is the definition of mitigation strategies and deployment strategies based on the new insights.

Step 1: define alternatives

The 1st step in the MAMCA approach is the definition of the problem and the identification of the alternatives (step 1). These alternatives can be any measure, technology or scenario that one wants to introduce in the urban context.

Step 2: stakeholder analysis

The methodology differs from the classical approach of multi-criteria analysis in the explicit introduction of stakeholders in a very early stage (step 2). These stakeholders are the key to identifying the criteria, which are here equal to the objectives of the stakeholders. Important in this 2nd step is to identify the most important objectives of the stakeholders. Within this paper, this was done for the case of urban and interurban freight transport (see below).

Step 3: define criteria and weights

For each stakeholder the criteria are determined on the basis of the aims and objectives of this stakeholder. The weights that have to be given are representing the importance the stakeholders are attaching to these objectives (step 3). For each assessed measure, the positive or negative impacts on the identified criteria (business opportunities, high level service, green concerns, network optimization, etc.) are pointed out and justify the out coming ranking of the various options able to specify the strong and weak points of each of them.

Step 4: criteria, indicators and measurement methods

In the 4th step, for each criterion, one or more indicators are constructed. The measurement method for each indicator is also made explicit. This allows measuring the performance of each alternative in terms of its contribution to the objectives of specific stakeholder groups to be undertaken. Steps 1 to 4 can be considered as mainly analytical, and they precede the 'overall analysis', which takes into account the objectives of all stakeholder groups simultaneously and is more 'synthetic' in nature.

Step 5: overall analysis and ranking

Any Multi-Criteria Decision-Analysis (MCDA) method can be used to assess the different strategic alternatives. In fact, the second generation multi-criteria analysis methods, the Group decision support methods (GDSM), are well suited for use in the MAMCA methodology as they are able to cope with the stakeholder concept. The PROMETHEE GAIA method has, for example, been extended in (Macharis, Brans, & Mareschal, 1998), the Analytical Hierarchy

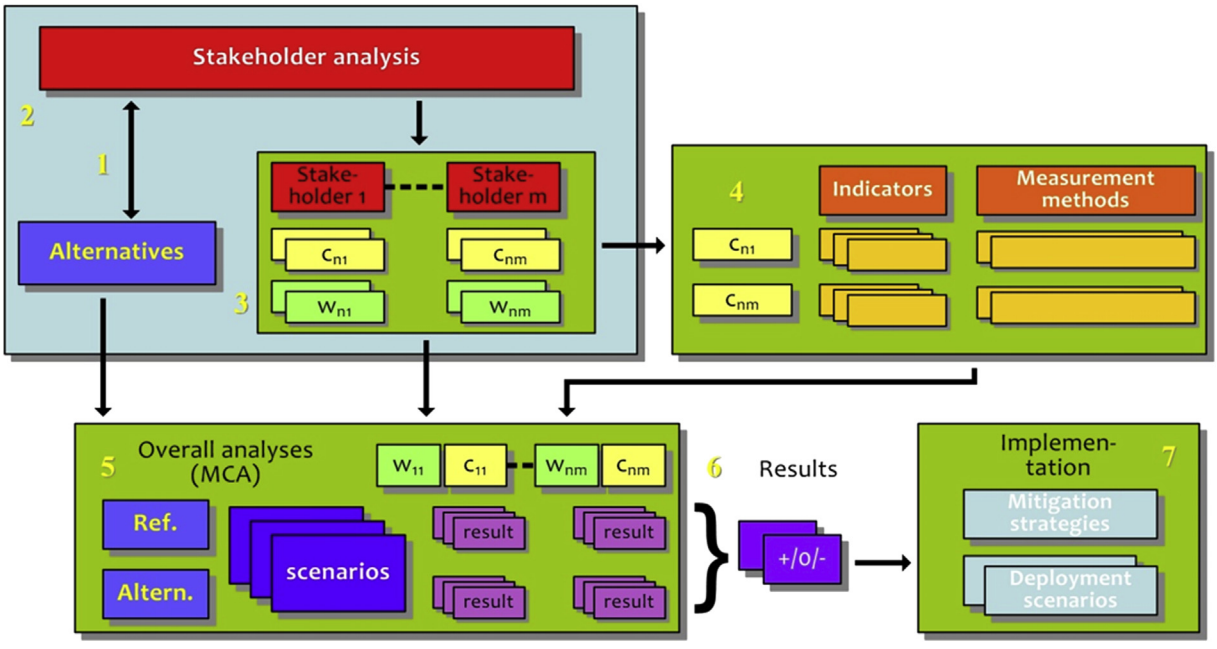

Fig. 1. Multi-Actor Multi-Criteria Analysis (Macharis et al., 2004).