Available online at www.sciencedirect.com

ScienceDirect

Transportation Research Procedia 24 (2017) 304–312

Transportation Research Procedia

www.elsevier.com/locate/procedia

3rd Conference on Sustainable Urban Mobility, 3rd CSUM 2016, 26 – 27 May 2016, Volos, Greece

Sustainable urban mobility indicators: policy versus practice in the case of Greek cities.

Pavlos Tafidis[a], Alexandros Sdoukopoulos[a]*, Magda Pitsiava-Latinopoulou[a]

[a]*Transport Engineering Laboratory, Department of Civil Engineering, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece*

Abstract

Nowadays, the significant economic and social changes that are taking place as well as the emergence of environment protection makes the need for sustainable urban mobility planning more and more necessary. Although sustainability is difficult to be measured directly, it can be evaluated through a system of parameters which reflect its dimensions. Indicators constitute part of this process and since their first establishment in 1992 by the United Nations Conference on Environment and Development they are being increasingly accepted as a tool for the assessment of the sustainable urban mobility mainly due to their simplicity in communicating complex phenomena. However, despite the great usage of indicator sets, there are still many issues to be addressed. In specific the large number of indicators makes, in the most of the cases, the evaluation process expensive, lengthy and in many occasions unsuccessful due to the absence of relevant data, especially in urban areas lacking organised databases such as Greek cities. The current paper reviews a considerable number of sustainable urban mobility indicators from the literature, examines the data availability, frequency and reliability in the city of Thessaloniki and finally argues towards an efficient, realistic and comprehensive indicator system as an evaluation tool of the mobility conditions in the Greek urban areas.

Peer-review under responsibility of the organizing committee of the 3rd CSUM 2016.

Keywords: sustainable mobility indicators; assessment methodology; data verification; Thessaloniki; Greek urban areas
* Corresponding author. Tel.: +30-2310-994160; fax: +30-2310-995789. E-mail address: asdoukop@civil.auth.gr

1. Introduction

The major urbanization trend that initially came up as a result of the industrial revolution in the early 20th century and continues till nowadays mainly in the developing world, while contributed to the economic growth and the social welfare, led also to the degradation of the environment due to the increase of externalities (Mori & Christodoulou, 2012). The poor performance in terms of environmental protection and the continuously increasing urban population, which according to UN-Habitat (2006) is predicted to reach even the 5 billion by the year 2030, are expected to impose significant pressures to the sustainability of the urban areas. Since the transport system comprises a significant component of every urban area, a great share of the externalities derives from its operation highlighting thus the emergence for sustainable planning. The sustainable transport planning approach, contrary to the priorities of the conventional approach which are the encouragement of the use of private vehicles and the construction of additional road infrastructure, focuses on the promotion of the alternative means of transport i.e. walking, bicycle and public

2352-1465
Peer-review under responsibility of the organizing committee of the 3rd CSUM 2016.
10.1016/j.trpro.2017.05.122

transport and sets as a primary objective the provision of mobility and information services as well as the better connectivity of the current networks.

Sustainable mobility is widely accepted as the vision for every urban area and according to the World Council for Sustainable Mobility (2001) is defined as "the ability to meet the needs of society to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values today or in the future". Since an "issue that is not clearly measured is also difficult to improve", the assessment of the current mobility conditions is considered as a necessary process towards sustainability (Böhringer & Jochem, 2007). Nevertheless, the latter is a rather complex and challenging issue as according to Bell & Morse (2008), sustainable mobility cannot be measured directly but has to be determined by a system of parameters which reflect its dimensions. Towards this direction, sustainable urban mobility indicators can play a key role (Jeon, 2007). Indicators are usually defined as statistics or quantitative measures designed to identify significant trends, point out problems, track the progress over time towards a specific vision-objective such as sustainable mobility, contribute to the priority-setting and inform both the experts and the public about a complex phenomenon in simply way (OECD, 1993; Guy & Kibert, 1998; Gilbert et al., 2003; EEA, 2005; Dobranskyte-Niskota et al., 2007). Since their first establishment in 1992 by the United Nations Conference on Environment and Development, where countries and organizations were asked to develop indicators systems in order to monitor the progress towards sustainable development, sustainability indicators are being increasingly used by international organizations, national or local authorities and other researchers within the framework of relevant studies and research programs (Tafidis, 2015). The most significant yet transport related initiatives are briefly described below.

Just one year after the abovementioned conference, the Organisation for Economic Co-operation and Development (OECD) presented a core set of indicators for reviewing the environmental performance and since then OECD has contributed significantly to the process of selecting and constructing indicators by publishing numerous relevant reports such as those entitled "Indicators for the Integration of Environmental Concerns into Transport Policies" (1999), "Towards Sustainable Development - Indicators to measure progress" (2000), the "Handbook on Constructing Composite Indicators - Methodology and User Guide" (2005) etc. In 1999, the United States Environmental Protection Agency published the document entitled "Indicators of the Environmental Impacts of Transportation" aiming at the definition of an assessment framework referring to the impacts of the operation of the transport system on the environment. At the same time and every year since then, the European Environment Agency presents the "Transport and Environment Reporting Mechanism" (TERM) annual report. TERM includes a set of sustainable mobility indicators while its major purpose consists of tracking the progress towards the targets set by the European transport policy through the White Papers (Gudmundsson, 2003). In 2001, the International Energy Agency (IEA) and the International Atomic Energy Agency (IAEA) concentrated their efforts on the energy performance indicators and published the report entitled "Indicators for Sustainable Energy Development", while 4 years later IAEA (2005) presented the next relevant report entitled "Energy Indicators and Sustainable Development". In 2003, the Canadian Centre of Sustainable Transportation suggested a compact set of 14 sustainable mobility indicators categorised into 7 framework topics while since then another Canadian institute, the Victoria Transport Policy Institute promoted to a considerable extent the research referring to the sustainable urban mobility indicators through its reports and papers e.g. "Reinventing Transportation. Exploring the Paradigm Shift Needed to Reconcile Transportation and Sustainability Objectives" (2003), "Issues in Sustainable Transportation" (2006), "Developing Indicators for Comprehensive and Sustainable Transport Planning" (2007), "Sustainable Transportation Indicator Data Quality and Availability" (2009). At the years 2004 and 2007, the World Bank developed the systems of "Performance and Impact Indicators for Transport" and "Headline Indicators for Measurement of Transport Results" respectively, while within the context of the report entitled "World Development Indicators" (2014), the values of an extended indicator system that includes also indicators relevant to transport, though not referring to the urban level, are presented for 188 countries. In 2005, the "Sustainable Mobility, Policy Measures and Assessment" (SUMMA) project funded by the European Commission's Directorate General for Energy and Transport was carried out with main objectives the development of an appropriate indicator system, the evaluation of the problems' scale regarding the sustainability in the transport sector and the assessment of the policy measures described in the White Paper. Moreover, two years later (2007) the Institute for Environment and Sustainability of the EC Joint Research Centre after an extensive literature review developed a comprehensive indicator system in order to assess the sustainability of the transport activities. Lastly, the