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Transportation Research Procedia 11 (2015) 413 – 421

Transportation Research Procedia

www.elsevier.com/locate/procedia

10th International Conference on Transport Survey Methods

Workshop synthesis: Caring for the environment

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Abstract

This paper summarizes the discussion of the "caring for the environment workshop", including the following research challenges in dealing with environmental concerns and preferences related to transportation decisions: adoption of multidisciplinary survey methods that account for dynamics in a broad sense, sensor-based and crowd-sourced energy and environmental inventories for active data collection, and design of effective behavioural interventions where data collection and information provision are integrated aiming at the goal of reducing environmental footprints. In particular, non-traditional tools such as gamification should be explored further as part of the design of the behavioural interventions.

Peer-review under responsibility of International Steering Committee for Transport Survey Conferences ISCTSC

Keywords: environmental costs; energy efficiency; measurement

1. Introduction

The goal of this workshop was to discuss different approaches for dealing with environmental concerns and preferences related to transportation and travel decisions. The discussed approaches included survey methodologies designed to capture awareness and attitudes toward travel/environmental issues as well as analytical approaches and modeling techniques to measure energy costs as well as the influence of perceptions and attitudinal factors on behavioural change to benefit the environment.

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Peer-review under responsibility of International Steering Committee for Transport Survey Conferences ISCTSC
doi:10.1016/j.trpro.2015.12.034

The motivation to study travel decisions that are guided by energy and environmental concerns is clear. The growing demand for mobility and the resulting growth of energy consumption have made the transportation sector the main worldwide contributor to the increase of greenhouse gas emissions (IEA, 2014). Moreover, an almost complete dependence on oil products renders mobility sensitive to changes in fuel prices and vulnerable to the depletion of fossil energy resources.

The necessary adaptation of the transportation system to reduce both emission production and reliance on non-renewable energy imposes multiple challenges to not only policymakers but also researchers. Besides the necessity of guaranteeing accessibility to everyone (equity), there is also the need of diminishing motorized traffic (notably by car) and encouraging those active transportation practices with a low environmental footprint. Technological change is another dimension for a shift toward a cleaner and energy-efficient transportation system, including development of ultra-low-emission vehicles (such as electric, hybrid, hydrogen cars). Due to the presence of various externalities, the socio-technical transition toward sustainable transportation needs to be shaped by means of a series of regulatory, demand-side management measures (such as area-specific road pricing, low emission zones, environmental tax on fossil fuels, energy efficiency and renewable fuel standards, and feebates for the purchase of new cars).

Beyond their technical and financial feasibility, the success of green transportation solutions requires a level of behavioural change that presupposes broad acceptance and adoption of sustainable alternatives by society. For instance, noticeable emission abatement needs an important increase in the share of transit, active transportation, and energy-efficient private transportation alternatives. However, competing with incumbent vehicle technologies is not trivial. A wide-scale switch to alternative-fuelled vehicles depends on consumers' willingness to pay in view of the (perceived) technical characteristics and performance, the purchase and usage costs, as well as the practical conditions of use (e.g. availability of a dense enough network of refuelling/charging stations) of the vehicles under consideration. Likewise, a constraining policy measure needs to earn sufficient approval among users, which presupposes a conviction of the soundness of the measure and of its fairness, as well as acceptance to the distribution of the implied burden (in terms of monetary costs as well as loss of "comfort" by renouncing to established lifestyles). Therefore, understanding the influence of people's perceptions of and attitudes toward environmental issues should constitute a key element in the understanding of travel and environmental behaviour.

The rest of this chapter is structured as follows. Section 2 lists the key emerging topics that were discussed in the workshop. Among the identified issues, two major challenges were discussed in depth drawing from the three contributed papers and three posters in this workshop, namely information and pro-environmental attitudes. Section 3 summarises the workshop contributions and discussion with regards to **information** and **measurement**. Section 4 summarizes the discussion about the role of **attitudes** and **perceptions** in the specific context of pro-environmental travel behaviour. Finally, section 5 concludes and sets priorities for the next conference.

2. Emerging topics to address the environmental impacts of transportation

In light of the contributed papers and posters, the conversations focused on the following key emerging issues:

1. Calculation and measurement of energy and environmental costs of transportation activities.
2. Survey methods using new technologies (Internet surveys, GPS-tracking, Smartphone, iPad, passive data using static and mobile sensors).
3. How to best frame environmental information to optimise behavioural impacts.
4. Knowledge about the reaction of transportation users to technological change. This includes electric, hybrid, and hydrogen vehicles, and the use of fuels other than gasoline and diesel.
5. Measuring the influence of attitudes and perceptions on behavior.
6. Investigation of the extent to which attitudes towards the environment and user-knowledge about cause-effect interdependencies between the transport system and its environmental impacts have an influence on travel behaviour.