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Travel demand management: short review of the special issue

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TRAVEL DEMAND MANAGEMENT: SHORT REVIEW OF THE SPECIAL ISSUE

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Editorial presents a review of all eleven original papers (and one book review) published in the current special issue on Travel Demand Management (TDM). This review is developed under five focus topics:

- traffic congestion charging;
- public transit or bicycles;
- traveller behaviour;
- travel plans;
- methodology.

Traffic Congestion Pricing

Road traffic congestion pricing was proposed as early as 1920s (Knight 1924) to internalize external costs drivers produce but do not bear by themselves. Singapore implemented the world's first congestion charging project in 1975. Since then, much effort has been put into designing and evaluation of congestion charging schemes. Zhang *et al.* (current special issue: 248–259) compare and optimize cordon and area traffic congestion pricing schemes from the standpoint of TDM.

Traffic congestion on motorways is also a concern. As a freeway TDM strategy, High Occupancy Toll (HOT) lanes have been deployed to manage traffic on High Occupancy Vehicle (HOV) lanes. To ensure the successful operation of HOT lanes, it is essential to periodically adjust the toll in response to the temporal variation in demand. It is widely acknowledged, however, that this task is complicated by heterogeneity of traveller will-

ingness to pay and uncertainties in time-varying traffic conditions. Taking into account these factors, Jang *et al.* (current special issue: 317–325) proposed an algorithm to determine the optimal toll level aiming to minimize the total delay borne by both HOVs and low-occupancy vehicles.

Public Transit or Bicycles

The customer perception of the public transport service level has been an important issue in cases where such services are offered aiming to reduce single-occupancy vehicle travel demand. Grujičić *et al.* (current special issue: 285–295) show that public transport customers perceive the level of service as an indicator of transport system quality and propose a method for identifying those elements that affect the perceived service level of public transport.

As more cities introduce *public bicycle* schemes (e.g. London in the UK, Hangzhou in China), the investigation of public bicycle operations and management (including the infrastructure for them) has been receiving an increased attention. Stewart and McHale (current special issue: 307–316) explore the characteristics of cycle lanes and their effects on driver passing distances in urban areas.

Traveller Behaviour

The essence of TDM is the management of traveller choice, which underlies a comprehensive understanding



of traveller behaviour. By means of a survey measuring situational and psychological factors important for the next car purchase, the impacts of adapting current taxation measures to incentivize Low Emission Vehicle (LEV) purchase and the potential role of a range of taxation measures on their decisions on the type of future car purchase, Carreno *et al.* (current special issue: 260–268) identify population segments according to their psychological preparedness and importance attached to situational factors in their future decisions to purchase a LEV. Al-Atawi and Saleh (current special issue: 269–277) find that travel decisions are usually influenced by accessibility as well as characteristics of the transport systems or the perception of service quality discussed in Grujičić *et al.* (current special issue: 285–295).

Travel Plan

As a TDM tool, a typical travel plan is composed of a package of measures that interact to change the means of travel. The success of a travel plan depends on a variety of factors, such as land use policy. Llewellyn *et al.* (current special issue: 235–247) compares the differences between the application of land use planning processes in England and Scotland.

Methodology

Since the 1970s, a series of TDM strategies have been put forward and implemented across the world. It is difficult to find a tool to evaluate the short-term, medium-term and long-term effects of a potential TDM strategy. Yang *et al.* (current special issue: 296–306), Ficzer *et al.* (current special issue: 278–284) and Grigonis *et al.* (current special issue: 334–341) are among those offering tools, while Ko *et al.* (current special issue: 326–333) offer a method for evaluating the efficiency of the current Radio-Frequency Identification (RFID) systems that are implemented to ensure the effectiveness of a Weekly No-driving Day (WND) programme introduced in Seoul, South Korea, in 2003 and Zhang *et al.* (current special issue: 248–259) offer a unified framework applicable to design both cordon and area charging strategies.

Yang *et al.* (current special issue: 296–306) propose a multi-agent based Q-learning algorithm to evaluate the effects of staggered working hours, in which travellers' behaviour of temporal and spatial choices in their activity-travel patterns is simulated. Ficzer *et al.* (current special issue: 278–284) present a case study of the possibilities of transformation from temporal space to geographic space and particularly the use of non-affine transformations of maps. The estimation of car ownership has been a research topic for decades. Provided that sustainability or environment has become one more dimension in estimating car ownership, Grigonis *et al.* (current special issue: 334–341) model the passenger car system in Vilnius (Lithuania) based on sustainable mobility principles.

In addition the issue presents the book entitled "Moving Towards Low Carbon Mobility" (Givoni, Banister 2013) review by Bruun (current special issue: 342–344). This is an excellent book with no shortage of up-to-date facts and figures or cogent arguments. But in their closing chapter, the authors definitely understate the

problems involved in trying to reduce global warming. A lot more needs to be changed than methods of evaluation and ways of thinking about transport. Higher levels of government largely ignore public opinion and ignore studies done by lower levels of government. A much more fundamental problem is the disconnection between politicians and the constituencies they are supposed to serve.

Clearly, the eleven papers (and one book review) in this special issue do not and cannot cover all issues related to TDM. The interested reader may refer to Meyer (1999), Luten *et al.* (2004), FHWA (2012, 2013), Bianco (2000), Bonsall (2009), Jou *et al.* (2011), Thompson and Suter (2012), Ungemah and Dusza (2009) for a comprehensive description of TDM.

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