



Rewarding instead of charging road users: a model case study investigating effects on traffic conditions

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Abstract

Instead of giving a negative incentive such as transport pricing, a positive incentive by rewarding travelers for ‘good behavior’ may yield different responses. In a Dutch pilot project called Peak Avoidance (in Dutch: “SpitsMijden”), a few hundred travelers participated in an experiment in which they received 3 to 7 euros per day when they avoided traveling by car during the morning rush hours (7h30–9h30). Mainly departure time shifts were observed, together with moderate mode shifts. Due to the low number of participants in the experiment, no impact on traffic conditions could be expected. In order to assess the potential of such a rewarding scheme on traffic conditions, a dynamic traffic assignment model has been developed to forecast network wide effects in the long term by assuming higher participation levels. This paper describes the mathematical model. Furthermore, the Peak Avoidance project is taken as a case study and different rewarding strategies with varying participation levels and reward levels are analyzed. First results show that indeed overall traffic conditions can be improved by giving a reward, where low to moderate reward levels and participation levels of 50% or lower are sufficient for a significant improvement. Higher participation and reward levels seem to become increasingly counter-effective.

Keywords: Pricing policies; Rewarding; Traffic conditions; Peak avoidance.

1. Introduction

Nowadays, increasing congestion levels, environmental pollution, and other external costs are experienced in most countries. Road pricing is seen as one of the most effective measures to battle these externalities. Road pricing does not need much introduction and for the interested reader we refer to Verhoef et al. (2008). An increasing number of countries has introduced some form of pricing, from simple local toll roads (e.g., Scandinavia, France), cordon charges (e.g., London, Singapore, Stockholm), and dynamic pricing (San Diego), to nation-wide kilometer charging

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