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The impact of telework on transport externalities: the case of Brussels Capital Region

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Abstract

Telework is often suggested as an instrument to improve sustainability by reducing environmental and socio-economical impacts of mobility on society. Currently, telework is however not yet implemented as a widespread measure in companies in Belgium. Goal of this paper is to determine if further encouragement of telework is indeed desirable from a sustainable mobility viewpoint and whether it should be supported by future policies.

Based on survey data, an appraisal of the environmental, mobility and socio-economic impacts of telework for companies located in the Brussels Capital Region (BCR) is performed. Traffic on the road network in and around the BCR is heavily congested during peak periods and every additional vehicle causes additional externalities. Congestion, climate change, air pollution, noise, traffic accidents and externalities linked to up- and downstream processes are the most well known transport related externalities, and are taken into account in the calculations. Survey data was generated through a questionnaire that was distributed to both workers and management of six large companies, whose main offices are located in the BCR and where teleworking is already practiced. For these companies, the external costs of trips to the central office are compared to the external costs of trips to satellite offices and the external costs caused by additional distances travelled when teleworking at home. Modal shifts occurring between trips travelled to the central office and trips travelled to the satellite office are taken into account and play an important role in the overall impact on external transport costs. Also receptor density and congestion levels along the routes travelled are taken into account. Results are calculated for the different modal choice scenarios, as well as on an aggregated level.

Keywords: Telework; Sustainable Mobility; External Costs

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1. Introduction

The number of commuters in the Brussels Capital Region has doubled since the 60s. Every day, 359,000 commuters come to work in the Brussels-Capital Region and 56,000 employees move in the opposite direction. In total more than 400,000 people therefore move daily to and from the Brussels Capital Region, where a total of 680,000 persons work.[†]

Consequently the roads in and around the region are increasingly jammed and associated with externalities such as pollution, congestion, noise and road safety hazards. Measures should therefore be taken to reduce the number of trips and/or travel distances, so that the quality of life in the region in terms of mobility, environment and road safety can be safeguarded (Castaigne et al, 2009) [1].

This paper examines whether telework could potentially contribute to reduce these problems. Telework is a form of work where employees can conduct their work activities outside the company headquarters (HQ) and this usually at flexible times. It is a recognized choice for companies that face spatial difficulties caused by a sudden rapid growth or as part of a restructuring phase, allowing more flexible work situations and creating competitive advantages (Illegems &Verbeke, 2003) [2]. Despite the fact that this work form exists already since decades, no clear definition is currently agreed on (Taskin & Walrave, 2010) [3]. However, regardless the differences between the definitions used, some essential elements always appear: the location dimension, the time dimension and the use of information and communication technologies (ICT) (Denolf et al, 2006) [4]. Telework can therefore be described as time and place independent working through employing ICT.

Telework may reduce the home-work trips (if the worker has a closer satellite office) and possibly even avoid them (if the employee can work at home) (Vanoutrive, et al 2010) [5]. Even if the implementation of teleworking through the extended use of ICT's is becoming more economically attractive, telework is as yet not a widespread measure in large companies (> 200 employees) in the Brussels Capital Region. The company transport plans of the Brussels Environmental Agency specify that only 36% of the large companies formally implement telework (BIM, 2010) [6]. Nevertheless telework has risen during the last years and in the statistics of the company transport plans there is an increase of 11% between phase 1 (25%) and phase 2 (36%) of the number of companies that included teleworking in their company transport plan (BIM, 2010) [6].

From a policy viewpoint the magnitude of the impact of teleworking on environment, mobility and socio-economic aspects is therefore relevant in order to determine whether a further encouragement of telework is useful and sustainable for the society as a whole. Illegems & Verbeke (2003) [2] estimate that for the Brussels Capital Region the annual avoided external costs of telecommuting amounts to between €215 million and €465 million. Given the still increasing congestion levels in recent years and the fact that additional time losses weigh heavily in the calculation of external costs, external cost figures can be expected to be even higher in 2010.

This paper focuses on the effectiveness of telework by determining the environmental, mobility and socio-economic impacts of teleworking in six major companies in the Brussels Capital Region (BCR), based on self-reporting surveys, both from employees and company management.

2. Methodology

The study was based on a survey conducted in six companies of Brussels with more than 100 employees and in which (part of) the staff teleworks. The companies were selected from the database on company transport plans of large companies provided by the Brussels Environmental Agency. Considering the importance of accessibility to the workplace as a determinant of the commuting behavior of an employee (Van Acker et al, 2007 [7]; Verhetsel et al, 2007 [8]) the selection of the companies also took into account different city areas as well as the existence within the company of mobility measures and a telework policy. A multistage random sample was

[†] Actiris (2007). http://www.actiris.be/2009/files/home_fr/Chiffres_emploi_et_chomage.pdf