Reducing dependency on special transport services through public transport

Lisa Hansson* and Johan Holmgren*

*Molde University College – Specialized University in Logistics, Britvegen 2, 6410 Molde, Norway

Abstract

One of the official transport policy objectives in Sweden is that all citizens should have access to the transport system. The public sector is therefore required by law to provide special transport services (STS) for those who are unable to use public transport or private car. STS is often provided through public procurement of taxi services. As a response to new legislation in 2000, there have been developments in the public transport sector, making buses, trains and other parts of the system more accessible to people with disabilities. These developments have also been driven by other objectives, such as reducing costs in STS by transferring passengers from STS to regular public transport. However, so far, there is little evidence of the effects of public transport access on STS usage.

The purpose of this paper is to study the effects of public transport system design on the demand for STS permits and usage. The main focus is on how different aspects of the general public transport system (e.g. price and supply levels) affect the demand for STS permits and STS usage per permit. In addition, the analysis will control for socioeconomic and geographical variables. It is concluded that the price and supply level of public transport do affect STS travel. Public transport price affects the demand for permits as well as the demand for trips from permit holders. Public transport service level only has an effect on the demand for permits.

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1. Introduction

An EU white paper has called for a more efficient use of the transport system (European Commission, 2011), emphasising a broader and more flexible use of transport instruments to manage the negative environmental effects of transport growth and costs (Hull, 2008). One of the most important aspects in this transition is modal integration and/or modal shift, such as reducing car use and increasing the use of public transport, walking and cycling. Modal integration and modal shift are core instruments in the Swedish transport policy, as well as in those of many other countries (e.g. in the UK as described by Hull, 2005) and in those of the EU.

When appropriately designed, transport policy measures can reduce levels of car use by promoting other transport modes (Banister, 2008; Holmgren and Ivenhammar, 2015). An often-forgotten group in relation to modal shift is that of people with special transport needs, such as disabled or older people. Mobility studies often focus on social aspects of inclusion and accessibility regarding this group (Alsnih and Hensher, 2003, Preston and Rajé, 2007). However, special transport services (STS) are also a policy area in which modal shift and modal integration are encouraged; especially a shift from special transport, using a car, to transport within the general public transport system. A central motive for such a shift from STS is the reduction of costs in special transport (SOU, 2009).

One of the official transport policy objectives in Sweden is that all citizens should have access to the transport system. The public sector is therefore required by law to provide STS for those who are unable to use public transport or a private car. In
Sweden, there have been developments in the public transport sector, making buses, trains and other parts of the system more accessible to people with disabilities (SKL, 2014). However, in practice, STS is often provided through the public procurement of taxi services. So far, there is little evidence of the effects of public transport accessibility on special transport usage.

The purpose of this paper is to study the effects of public transport system design on the demand for special transport permits and usage. The analysis includes two related parts. The first part of the analysis examines the proportion of people in a geographical area holding a special transport permit. This reflects how public officials (who approve the permits) perceive the need for (or the option of) using STS among the population. The proportion of people having permits also reflects the perceived need for STS among the public (which applies for permits). For policy reasons, the focus is on how different aspects of the general public transport system (e.g. price and supply levels) affect the demand for special transport permits; however, the analysis will also control for socioeconomic and geographical variables. The second part of the analysis examines the actual number of trips taken by permit holders, using the same variables as before; this part reflects the actual usage of the service.

Most people using STS are elderly, and the importance of understanding the travel behaviour of this group will only grow. Several authors have acknowledged the fact that increased life expectancy will result in a growing proportion of the population being above 65 years old. This may have important implications for future travel patterns and may increase the demand for a flexible and widely accessible transport system (Alsnih and Hensher, 2003; Hjorthol et al., 2010; Shergold et al., 2015; Dejoux et al., 2010; van den Berg et al., 2011; Metz, 2000). Metz (2000) points out that having access to people and places in addition to the possibility of “getting out and about” provides a range of psychological as well as physiological benefits. It is therefore important to increase the understanding of travel behaviour among the elderly and disabled and to examine to what extent regular public transport can play a role in securing their mobility in an efficient manner.

Even though older people might experience reduced physical mobility, they have more time available for activities outside of work, which increases their demand for social trips (van den Berg et al., 2011). Hjorthol et al. (2010) and Dejoux et al. (2010) find that mobility among older people has increased substantially in comparison with the same age groups 20 years ago and that this development is likely to continue. This demand for mobility varies between different groups: higher education tends to increase mobility; women are more mobile than men; and mobility typically falls with age (Dejoux et al., 2010). Several studies point out that there is a substantial difference in behaviour between those aged 65–75 and those above the age of 75. For example, people above 75 are less mobile in general (Hjorthol et al., 2010).

Aarhaug and Elvebakk (2015) find that increasing the accessibility of public transport has a positive impact on public transport usage among the elderly and disabled. The main effect is caused by people who already use public transport continuing to do so for longer as they grow older. However, the overall effect is found to be lower than what was expected, and Aarhaug and Elvebakk point out that it is important to ensure that accessibility in the entire system is increased so that there are no gaps. In line with this finding, Neven et al. (2015) conclude that a good general public transport system with improved accessibility reduces the need for STS.

A vast number of studies related to travel behaviour have analysed why people choose a specific mode. Typically, these studies focus on how monetary and time costs affect mode choice and, most commonly, on the choice between private car and public transport (e.g. Hensher, 1998; Beirao and Cabral, 2007). There is also a large body of literature on the emotional aspects of travel behaviour (Anable and Gatersleben, 2005; Ellaway et al., 2003; Stokes and Hallett, 1992; Steg et al., 2001). The preferred mode of transport for those aged 65–75 and those over 75 is the car, as either driver or passenger (Alsnih and Hensher, 2003). Over the past 20–25 years, car ownership and usage among older people has increased. This development is especially prominent among women (Hjorthol et al., 2010). Feelings of control, freedom and independence are important factors that influence a choice of car as the preferred travel mode (Burns, 1999). Public transport, on the other hand, is not associated with those positive attributes (Stradling, 2011). Similar patterns are found among disabled people (Nordbakke and Hansson, 2009).

Schmöcker et al. (2008) estimates a mode choice model for shopping trips by older and disabled people and concludes that the demand for taxi trips increases with age, and that disabled people and those in wheelchairs have a low probability of choosing the bus. Men are less likely to go by bus than women, and are also less likely to make complex trips with multiple purposes (Fengming and Bell, 2012).

Even though many studies exist on mode choice in general, on older people’s use of public transport, and on the attitudes and experiences of disabled people, the knowledge of the demand for STS and more specifically of how this demand is affected by the design of the general public transport system is scarce. For this reason, this study focuses on the determinants of STS usage.

The results show to what extent different aspects of the general public transport system affect STS. The paper contributes to new knowledge that could be used in planning a transport system that is accessible to all citizens, while keeping the need for costly STS to a minimum. This paper can also be seen as a complement to the ongoing research on sustainable transport systems (e.g. Banister, 2008; Rosenbloom, 2001), in terms of analysing social (i.e. the travel demand of disabled passengers) and environmental (i.e. the shift from special transport by car to public transport by bus) aspects of public transport that are related to cost efficiency.

The analysis is performed using data from the 21 Swedish counties covering the period 1998–2014. The transport-related data is provided by the Swedish governmental agency Transport Analysis, to which municipalities and transport suppliers are required to report key statistics. The other data is provided by Statistics Sweden.

2. Special transport services (STS) in Sweden

Sweden is located in northern Europe. It is a sparsely populated country with 9,750,000 inhabitants, spread over an area of 450,000 km². The main population is located in three large city areas (Stockholm, Gothenburg and Malmö) and in approximately
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