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# The use of stated preference techniques to model modal choices on interurban trips in Ireland

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## Abstract

The study examines the perceptions and preferences of passengers on interurban rail and bus and compares the preferences of passengers on both these modes. This is carried out to identify where passengers feel changes are needed to both modes to improve services, and to contrast the services offered by bus and train in Ireland. The preferences and perceptions of passengers are collected using both stated preference and revealed preference techniques. The impacts that different types of stated preference questionnaire have on the responses of individuals can, therefore, be examined. The study also compares stated preference models with revealed preference models and looks at if these can be pooled to take advantage of the benefits offered by both stated preference and revealed preference models.
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## 1. Introduction

This paper describes a study carried out to examine the perceptions and preferences of passengers on interurban routes in Ireland. Passengers on both bus and rail routes are examined. Many factors influence the demand for interurban travel. Wardman (2006) describes some of these as car travel time, car ownership, travel costs, fuel costs, population and GDP. Several of these factors are external to the rail and bus industry and so it is difficult for the industry to control them.

After decades of under-investment, there has been a fundamental change in the Irish Government's transport policy, driven primarily by safety considerations, committing significant new funding to the renewal and development of the rail system (MPE, 2001). The purpose of most of the Irish Government's investment in renewal and expansion of the rail services is to improve passenger transport and consequently increase the modal share of rail. Even though there is huge investment in railways, the question is 'will investment alone lead to increased demand for rail passenger transport?' especially when rail tickets prices are higher than the

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competing intercity bus services and the relatively low cost of motoring and airline services in Ireland (Ahern and Anandarajah, 2006).

Ireland is a small, modern, trade-dependent economy experiencing high economic growth in the last decade with an annual average growth rate of 7.6% in the period from 1991 to 2001. Public transport has an important role to play in supporting economic growth and social progress. Rail and bus are important modes of public transport for people mainly on intercity routes.

In this study, the preferences of passengers on interurban rail and bus journeys have been examined. The objective is to establish the differences between the passengers on both modes and the differences in the transport services that are available. In the conclusion, the consequences of these differences for transport policy in Ireland are discussed.

To gather data on the preferences and perceptions of passengers on both modes, a series of stated preference and revealed preference studies have been carried out on-board interurban trains and buses. Stated preference studies have been used in the past to look at the relative importance of different modal attributes. Hensher (2003) used stated preference studies to determine the value of time, for example. In the mid-1980s the Department of Transport in the UK conducted a major study into the value of travel time, using stated preference methods primarily (MVA et al., 1987) and this provided to be a turning point for the acceptance of stated preference methods in the UK, as this study seemed to demonstrate that stated preference studies could give the same results as revealed preference studies but could do so more cheaply. Apart from the Strategic Rail Review (Department of Transport, 2003) there have been very few studies of the value of time in the Irish context. Even in the Strategic Rail Review, it is unclear whether the value of time in this example was derived from Irish studies or whether it was adapted from international studies. Also the study assumes that individuals on different routes have the same values of travel time.

The paper is divided into several sections: the context of the study. Section 2 describes the studies that took place and includes discussions of the relative merits of revealed preference and stated preference studies, and the differences between the two methods. Section 3 describes the results of the study – both in terms of the differences between the stated preference and revealed preference studies and the usefulness of pooling Revealed Preference and Stated Preference studies and also the perceptions and preferences of rail and bus passengers, examining what these perceptions and preferences mean for transport policy.

## 2. The study context

Ireland's rail network follows a radial pattern, extending out from Dublin. The lines are controlled and operated by Irish Rail, a subsidiary company of CIE and there are nine interurban rail routes: Dublin–Cork, Dublin–Galway, Dublin–Limerick/Ennis, Dublin–Sligo, Dublin–Wexford/Rosslare, Dublin–Belfast, Dublin–Tralee, Dublin–Waterford and Dublin–Westport/Ballina. In terms of passenger numbers, the Dublin–Cork route is the busiest with 3.9 million passengers in 2002, while the Dublin–Westport is the least busy with 403,000 passengers in the same year. Altogether, the interurban rail network is estimated to have carried approximately 9.3 million passengers in 2002 (Department of Transport, 2003).

There are several studies examining the use of rail and bus on interurban trips and on the factors that influence modal choice on these trips. Coto-millan et al. (1997) presented a theoretical model of intercity passenger transport demands (road, rail and air transport) in Spain using co integration and error-correction techniques. Owen and Phillips (1987) and Wardman (1997) analysed intercity rail passenger demand in Great Britain. The former used the tools of econometrics while the latter used direct demand models. Ponnuswamy (2004) finds out to what extent the fare structure and service level affect the patronage of urban rail transit in India. Other researchers such as Bel (1997) have looked at the impacts of non-monetary characteristics, such as travel time, on rail demand on interurban trips. Bel (1997) points out that journey time by rail represents a negative relationship with rail demand. Bel (1997) stresses the importance of road travel times on interurban rail. According to Bel's research (1997) journey time by road coach represents a positive relationship with rail demand.

In this study it was essential that participants had a choice between bus and rail for their journeys. This was because in this study the participants' SP responses would be compared to their real-world choices. Therefore, only routes where bus and rail were available could be included. In addition, only routes where bus and rail services were of a similar standard were considered. In this way it was hoped that individuals travelling on the