

## Light rail and travel behaviour

Author: Dr Shin Lee

### Introduction

Rail schemes are often promoted and implemented for their potential to reduce people's dependence on private automobiles. This is because private automobiles are deemed to contribute to various global and local environmental problems. During the 1980s, five light rail schemes opened in four English cities, partly funded by central government grants. These were Greater Manchester's Metrolink Phase 1 (opened 1992) and Phase 2 (opened 1999), the South Yorkshire Supertram in Sheffield (opened 1994/5), the Midland Metro from Birmingham to Wolverhampton (opened 1999), and the Croydon Tramlink (opened 2000). Part of the justification for these investments, and for government grants towards initial development, was that car users would be encouraged to switch to rail, especially at peak commuting times, and that road congestion might therein be reduced. Therefore, the purpose of our research was to examine whether car ownership and car usage was reduced due to the opening of the five new light rail schemes, and if not, why not.

The performance of rail services is often measured by patronage i.e. the number of passengers travelling by train.

However, this does not capture rail services' impacts on car usage or car ownership. The 1991 and 2001 UK National Census data provide us with an opportunity to examine the changes in car ownership and car usage resulting from the five new rail schemes, because these rail schemes all opened in the 1990s. Information on travel mode i.e. type of transport used for work trips, together with residential location and work place location, is available in the Censuses. However, to measure the impacts of new light rail services on travel behaviour, other potential impacts on travel behaviour need to be isolated, as much as possible. In our study, this was done by comparing the changes in people's travel behaviour in the new light rail corridors with changes in people's travel behaviour in 'control' areas. In this way the control areas represent what would have occurred in the new light rail corridors if the new rail schemes had not been built. The control areas were selected on the basis of car ownership, their distance from the city centre, and the relative importance of rail commuting in 1991.



### Findings

#### Impacts on car ownership

Despite two light rail schemes achieving and even exceeding the forecast ridership, the proportion of households owning more than one car increased in the light rail corridors and typically by more than in the control areas, during the Census period. More specifically, the analysis of Census data found that:

- The light rail schemes outside Greater London have not prevented car ownership or multiple car ownership from increasing.
- There is weak evidence that the South Yorkshire Supertram may have had a very small restraining effect on car ownership growth.
- In the Croydon Tramlink light rail corridor there are some more positive trends when compared to the control areas, but the significance of these trends is small.

#### Impacts on the use of other transport modes

Our study also explored whether the introduction of a light rail scheme impacted upon the proportion of journeys made by rail, and if there was an increase in the proportion of journeys made by rail, how this affected the use of other forms of transport (e.g. bus and car). When considering all journeys that a person made, the study found that there were modest increases in the proportion of journeys made by rail. Interestingly, however, these were made at the expense of bus trips not car journeys.

Our study also examined whether people's use of rail increased for journeys into the city centre, and found that the share of journeys made by rail significantly increased for travel into the city centre. However, the most significant impact on other transport modes of these increased train journeys into the city centre was, again, on bus travel and not on car journeys, with the proportion of journeys by bus reducing considerably.

The findings of our study were then compared with findings from previous, both domestic and international, studies of effects of light rail on car ownership and use (Hass-Klau and Crampton 2007).

It was found that French and German light rail schemes had stronger effects on restraining and reversing car ownership growth. Possible reasons include:

- Relatively low public transport network densities in Britain (especially compared to German cities).
- Relatively low residential densities in Britain (especially compared to French cities).
- High fares and sub-optimal routeing in Britain (e.g. use of existing rail alignments were encouraged for cost or regeneration reasons whereas French light rail schemes are normally designed to serve high density areas).
- Lack of complementary measures (e.g. parking pricing, park-and-ride or congestion charging scheme).

### Recommendations

Therefore, in order to encourage the reduction of car ownership and car usage through the development of new light rail schemes, it is recommended that:

- The train fares set are affordable for the intended users.
- That other policy measures that deter car usage are introduced in conjunction with new light rail services serving city centres, such as increasing car parking charges in the city centre or introducing congestion charging in the city centre, to encourage car users out of their cars and onto the new rail service into the city centre.

### Conclusions

- People's willingness to switch modes of public transport for some journeys is high e.g. from bus to train for city centre journeys.
- New investments in one form of public transport do not necessarily increase the total share of journeys made by public transport, as they can fail to attract people who previously journeyed by car. Therefore other measures might be necessary too. It is as though there are separate markets for car users and public transport/sustainable travellers.

### References

- Hass-Klau, C., Crampton, Ferlic A (2007) The effect of public transport investment on car ownership: the results for 17 urban areas in France, Germany, UK and North America. Brighton: Environmental and Transport Planning

### Further information

- <https://www.gov.uk/government/organisations/department-for-transport/about/statistics>