

# Understanding the Market

It's one thing knowing how much traffic you've got on your railway (although a remarkable number of railways don't know that very accurately, either!) However, it's a different thing understanding what types of traffic you have, and why your customers have chosen you (or not). With partners Interfleet Transport Advisory, the Railway Consultancy was therefore delighted to win a tender to understand the off-peak travel market for London's fast-growing Docklands Light Railway (DLR).



*DLR train approaches Royal Albert*

With a new franchise about to begin, the DLR was keen to understand in greater depth its off-peak market, as traffic has fulfilled expectations despite an economic downturn and the non-delivery of some local property developments. With Interfleet Transport, we carried out a programme of work, which included

- a general understanding of the background drivers for railway demand, and how these had impacted upon the rail travel market in the Docklands area;
- a comprehensive review of previous studies on subjects such as barriers to use of the DLR;

- econometric analysis of a large DLR boarding/alighting dataset, underpinning a model of offpeak demand;
- 3700 on-platform daytime surveys, which enabled a picture of offpeak travel behaviour to be built up;
- stakeholder liaison with local authorities; and
- focus groups of non-users.

The insights provided by these various strands of work enabled the development of a strategy to exploit the market segments identified. This included a recommendation for the DLR to reconsider its existing off-peak market segmentation.



*DLR services at Poplar*

In the light of the possible extension of London Underground's operating hours, further research was then undertaken into the late evening market, including on-train surveys, and analysis of night bus and wider London travel datasets.

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## Editorial

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From time to time, one needs to take a step back from the daily rush and consider what has been achieved. This is as true of our business as the railway industry as a whole.



*Refurbishment of Crystal Palace station has included the reinstatement of blocked-up windows to our offices*

Despite the lull in franchising activity in Britain, we have had a busy year, with foreign work complementing that back at home. We have survived a long Winter exacerbated by the final works to Crystal Palace station, the location of our main office. But eventually things are completed, and we now work in a station which is historic but fit for the 21<sup>st</sup> century.

A number of major rail projects have been finished recently, and there seems to be something of a lull before the next major project completions. However, lots of planning work is essential – whether in understanding the market (as in our work for the DLR), improving operational performance (our continuing work in Norway), improving customer satisfaction (as at Lewes), improving environmental performance (as with station access) or actually looking at completely new lines (as in Turkey).

Whichever of these you are trying to do, we can probably help. So do get in touch. Come and see us in our wonderful new old station.

*Nigel S Harris*

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## Project News

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### Boarding & Alighting Research

London Underground necessarily uses a Train Service Model to simulate changes to infrastructure and service patterns across its network. This model dates from the 1980s, and incorporates a function which estimates station stop times, which are a key element of journey times and hence the service offered to passengers. It was decided that, given the age of the previous work, this model should be reviewed, and a contract was awarded to the Railway Consultancy (RCL), working with Imperial College (IC).

RCL and IC's Railway and Transport Strategy Centre have cooperated for almost 20 years on urban rail issues, which has enabled us to build up a database of station stop surveys from key metros and urban railways around the world (part of the RTSC's international benchmarking work). These surveys are to a consistent format, and include information both on passenger movements and the detailed timings of events within station stops. That data has also, over time, been supplemented by other RCL work (e.g. for the Tyne & Wear metro, and Norwegian State Railways), creating a database of over 125 observations.

As part of this project, RCL undertook an international literature review of research undertaken into station stop times, which found major contributions from researchers in Germany and Sweden, in particular. (Although the former of those had to be read in the original German, the latter was fortunately written in English!) That research enabled the development of hypotheses regarding the impact of a range of variables relating to passengers (e.g. the ratio of boarders:alighters), trains (e.g. door width) and platform conditions (e.g. distance to the nearest exit). These hypotheses were then statistically tested on the international database using a state-of-the-art multivariate fractional function, which enabled the derivation of 7 statistically-significant parameter values for variables determining passenger boarding and alighting rates. An iterative approach was used, to ensure that statistical explanation was maximised within a reasonable theoretical framework, but in fact constraints of simplicity and good theory led to only a minimal reduction in explanatory power. This enabled LUL to take forward the revised model formulation with confidence, on the basis of a much better understanding of passenger behaviour.

It is hoped to publish an academic article summarising this work for a wider audience in the near future.

### Station Travel Plan Evaluation

Following on from our previous work for RSSB on evaluating the pilot station travel plan programme, we were pleased to win a contract with Central Bedfordshire Council to undertake research at the three stations within their area. The objective was to improve sustainable access to Flitwick, Harlington and Leighton Buzzard.

In excess of 1300 responses were received across the three stations. Leighton Buzzard is the busiest but all three stations' passengers share similar socio-economic characteristics.

The access mode was mapped by passenger postcode. This helped clearly visualise for each station that, as one would expect, passengers living very close to the station tended to walk, while the residents further away were more likely to choose to use the bus or drive.

The geography of the three towns (each with lots of small satellite villages) may make it difficult for people to change their journey habits, as bus services would be difficult to justify and distances are too great for walking. Nevertheless, improvements to cycle provision and minor changes to bus routes could help to provide realistic alternatives to driving, and help to improve sustainable access to the railway.



*Leighton Buzzard station is already served by a range of buses – but do they go where rail passengers want?*

A common issue to be addressed across each of the three stations is the need for step-free access. In addition, passengers at all three stations felt that car parking was insufficient and too expensive. However, respondents also had more specific requests at each of the stations, including improvements to lighting and maintenance of station approach roads, which are issues within the ambit of local authorities.

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### Turkish Branch Line Study

The Turkish railway network is relatively sparse, and some centres of significant industry remain distant from the network. With railways now politically-acknowledged to be important mode of transportation in Turkey, and with the elements of a high-speed passenger network put in place, TCDD is turning its attention to improving its freight transport. Working with a consulting firm PGlobal based in Ankara, the Railway Consultancy was tasked with providing some background guidance as to the likely viability of constructing freight branch lines to a range of locations and comparing different modes of transportation linking industries to the closest railway stations, through provision of a simple spreadsheet model.

RCL's work was to construct the model and develop the underlying logic, whilst PGlobal collected data on freight flows to/from the areas of interest, identified the

industrial zones, clusters and plants having annual transport capacity of 200 000 tonnes or more, specified the shortest rail routes to the main railways (to which the branch line would be connected), and provided an assessment of the economic and social impact of it.

Whilst the model could not hope to capture all the relevant nuances of the operational planning of freight trains (including portion working, cross-forming and back-haul), it was able to provide guidance on likely train quantities, taking into account traffics limited by either weight or length. The competitive position regarding other modes was taken into account by examining the relative times and distances by competing modes (road and sea), with a logit model applied to provide an estimate of mode share. The model also calculated the environmental and road safety consequences of transferring the traffic to rail. We look forward to some of the more promising schemes becoming reality, and providing new rail freight for the network.



### Lewes Station Facilities

Southern, who manage the station at Lewes, commissioned the Railway Consultancy to investigate how the facilities could be improved to provide their customers with a better experience.



Almost 150 passengers were surveyed over two days and feedback was mixed - while some passengers were content, others wanted improvements or alternatives to

the available facilities. A large majority thought Lewes station should have a newsagent's and the facilities to serve food and hot drinks. With these already present, passengers also suggested improvements and alternatives they wanted including: a sandwich bar, a mini-supermarket, and a pub/bar. It was obvious that a large chain retailer would not be welcome at Lewes station; however, it was suggested that the station could be improved if it had a small independent grocery. Some criticisms of existing facilities were that they were outdated, the choice of available food and drink was poor, and items too expensive. In addition some facilities were not open late enough for commuters returning in the evening.

Southern will need to carefully consider how best to cater for passenger needs at Lewes. Changes such as modernising, extending opening hours and accepting payments by credit card could make passengers far more satisfied with the facilities; a new business may be more able and willing to bring these improvements and bring the facilities into the 21<sup>st</sup> century.

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### Publications

The Wheel:Rail Interface Handbook, sponsored by Network Rail and published in 2011, contained results of several years' research by the University of Birmingham and others. Because of its popularity, we have had to have a re-print, which is now available through [www.anharris.co.uk](http://www.anharris.co.uk).

We are also collaborating with others to produce a book on the principles of planning and operating urban railways. This has a draft title of "Designing and Managing Urban Railways" and is due in early 2014.

With franchising an area of continuing interest, we were pleased to be able to publish – after a long gestation period - some research of ours into the expected premiums for the East Coast Main Line, a franchise which has seen two failures since privatisation.

The article\* describes the development of a regression model which provides a relationship between average train loadings and British train operator profitability – except for the two 'true' InterCity operators (West Coast and East Coast). These two companies both seem to have lower profitability than would be expected from an analysis of other operators, a fact which is attributed to

the extra costs of providing InterCity services (e.g. full catering facilities on long trains). We also note that these longer-distance train operators may be chasing additional patronage at relatively low fares, which do not contribute significantly to income – or the potential to pay a premium back to Government. Our estimates of the appropriate premium for East Coast are closer to the amounts currently being paid by DOR than those promised by either GNER or NatEx.



\*Harris, N G (2013) "Estimating the Profitability of the British East Coast Main Line", *Proc. ICE* 166. (3) pp. 168-173.

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The Railway Consultancy provides services across areas such as demand forecasting, operational planning, strategy and business development; for more details see our website [www.railwayconsultancy.com](http://www.railwayconsultancy.com)

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