The Railway Consultancy Ltd
Specialists in Planning Economics and Management

Solving Capacity Constraints

Passenger rail travel has broadly doubled over the last 25 years in Britain, which is great news where there is capacity to accommodate it. However, although railway capacity may often be thought of as an urban problem, British Rail's cost reductions on some rural lines have left them without the ability to accept extra traffic.

A classic case of this is the Lakes Line, a 10-mile single-track branch line from Oxenholme (on the West Coast Main Line) to Windermere. The current hourly service has been strengthened from 2 to 3 carriages, but even this is sometimes inadequate for the demand. Moreover, the shuttle-type service does not provide through trains to key offline destinations such as Manchester, nor to support incoming tourists from Manchester Airport. Although the new Northern franchise is expected to bring new trains and 4 services per day to Manchester, and Network Rail has plans to electrify the line, a long-term strategy for the line did not exist, and the Railway Consultancy was asked by the client group to develop one.

We undertook a range of stakeholder liaison, to understand the needs of local people and businesses, and the ideas they had for improvements. Of the 10 major areas covered, it became clear that some form of infrastructure intervention would be required, in order to satisfy the expected demands, as an increase in train service frequency is not possible without some form of loop or double-tracking. Timetable analysis showed that this would need to be somewhere in the Burneside area. Whilst colleague Julian Sindall of Cadenza Consulting provided engineering cost estimates for possible solutions, we developed ideas for improving stations along the route, as there is very little car-parking anywhere, whilst Staveley station is reached only by 41 very steep steps. We therefore developed a number of options for further analysis.

An analysis of ticket sales data revealed a gradual trend of long-distance traffic increasing at a faster rate than local traffic, and enabled us to derive

3-car train formation at Burneside

rate than local traffic, and enabled us to derive demand forecasts for the options, to ascertain the likely increase in revenue. In fact, the diversity of offline destinations and lack of intermediate demand between Oxenholme and Lancaster meant that the business case for more frequent (e.g. hourly) through trains to Manchester is relatively weak. On the other hand, the case for increasing the frequency of service on the branch itself is very strong, because this would benefit all traffic (both local and long-distance, where the ability to make better connections with a wider range of mainline services would be particularly valuable). Longer-term aspirations for a second platform at Windermere, to improve service reliability and potentially even enable charter trains, were noted for later implementation, potentially taking advantages of synergy of works with re-signalling expected in 10 years' time.

The timing of this current work, however, should enable Network Rail to make passive provision for likely options during the impending electrification, whilst the Department for Transport, Local Enterprise Partnership and others consider how to fund the service frequency increase which should help bring tourists to the Lake District by rail and not by car.

The Railway Consultancy Ltd
Managing Director: Dr Nigel G Harris.
Principal Consultant: Richard Talbot.
Senior Associates: Jerry Gold, Hans Haugland. **Finance & Admin Manager:** Alison Harris.
First Floor, South Tower, Crystal Palace Railway Station, London, SE19 2AZ
Tel: +44 20 8676 0395 **Fax:** +44 20 8778 7439
e-mail: info@railwayconsultancy.com **Website:** www.railwayconsultancy.com

Project News: National

Streatham Rail Study

Crossrail 2 is a long-standing rail scheme in London, running South West – North East, but current proposals do not see it serving Streatham. However, some local residents were of the feeling that they were not benefitting from the significant investment in rail occurring elsewhere in the capital, and noticed that the National Infrastructure Study had suggested analysis of alternative options for Crossrail 2 which did serve Streatham. The London Borough of Lambeth felt that the Council should get some professional help in assessing the validity of both the complaint and the possible solution, and engaged the Railway Consultancy to help.

Using PTAL and TIN accessibility and journey time data from Transport for London, we were able to support the claim that Streatham is relatively poorly-served, compared to suburbs at similar distances from Central London. Key reasons for this are the fact that it is away from the tube network, and served by several rail lines, each of lowish frequency, which do not connect well with each other. Analysis also showed that this issue was not going to improve in the future, given current proposals for upgrading the Northern line, and constructing Crossrail 2.

In order to make best use of train paths, CR2 trains on a Streatham branch might rejoin the main rail network at Streatham Common

We noted that there were a number of public transport interventions which could be appropriate for Streatham but, if a rail solution was desired, then an amendment to the publicly-consulted Crossrail 2 could be valuable. A loop from the main Crossrail 2 route would disbenefit many users trying to access Central London from Wimbledon and beyond, because of the increased journey times, and so was rejected. However, a branch line from Crossrail 2 did appear to have considerable merit. Current plans suggest that 10tph will be turned at Wimbledon - but these could instead run from further afield. Whilst our assessment was that Streatham itself had insufficient demand to be able to support an underground rail extension, it would be possible to resurface just South of Streatham, and divert some existing suburban rail services into the new tunnel, thereby gaining a bigger market. As the journey times between (say) Selhurst and Victoria would remain unchanged, but services would now run beyond Victoria into Central London, this option potentially enhances the scope and volume of benefits for the Crossrail scheme.

Whilst construction of the new branch line would clearly be a major cost, it would enable some significant savings in the proposed scheme. First, a more direct alignment (with attendant time saving benefits) would be possible between Clapham and Wimbledon, because interchange between Crossrail and the Northern line could occur from the proposed branch (which would cross it) rather than from the main Crossrail route (which otherwise runs 2kms to the West). Secondly, the proposed service reversing arrangements are relatively disruptive in the Wimbledon area, and simpler/ cheaper/ less disruptive physical works would be possible there.

We therefore recommended a more detailed analysis by Transport for London of our proposals, to see if they did indeed increase the Benefit:Cost ratio of this major new proposed railway.

Hedge End Update

Further to our work in supporting a development adjacent to Hedge End station in Hampshire, we were delighted when the planning inspector found in favour of our clients. It seemed particularly sensible to us, that a 680-unit housing development right next to a railway which is not at capacity should be approved, enabling more people to travel sustainably.

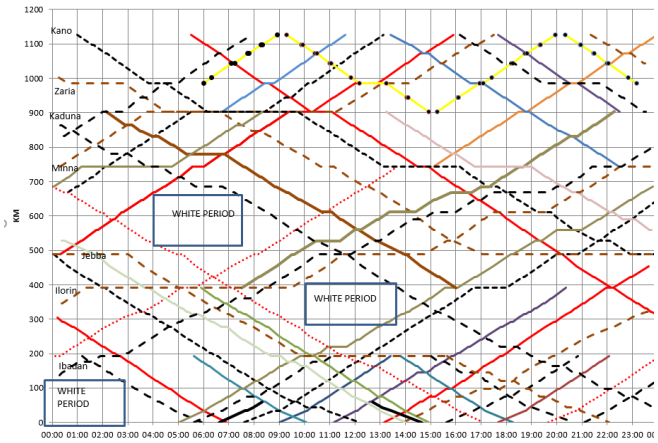
Hedge End station was opened in 1990, but the land immediately to the left of this picture remains undeveloped

Nigerian Western Corridor Railway Concession Study

During the year, The Railway Consultancy completed a comprehensive study on this proposed concession, as clients of ours were and remain interested in submitting a tender for operation of this railway. The Western Corridor is already actively operated by Nigerian Railways, but has huge scope for development, in terms of commuter and inter-city passenger traffic, and both bulk and containerised freight.

Road transport is utterly dominant in Nigeria, despite its slow speeds and the poor quality of infrastructure – surely an economic case for rail development

This thorough study has enabled us to understand the risks and opportunities associated with rail operation in this corridor, and has included assessments of:
o passenger and freight demand and revenue;
o traffic levels and operational processes (including a full timetabling and staff rostering exercise);



Timetabling and allowances for track maintenance are particularly important on single-track railways

o infrastructure condition, and enhancements needed to support future traffic levels at appropriate levels of punctuality;
o rolling stock quality and performance (existing, new/refurbished vehicles, vehicle cascades);
o the fleet sizing of hundreds of vehicles across multiple (freight and passenger) types (dependent upon all the above factors);
o commercial processes (e.g. retailing and organisational requirements); and
o derivation of cashflow and profitability estimates, and hence overall impacts on funding.

Container trains have recently been running but track remains in a poor condition

Importantly, we ensured that the appropriate systems linkages between these workstreams were made clear to the client, so that they could see the impacts of possible investments on both costs and income. This was particularly important since the traffic potential for this corridor is very significant, and various options were presented for major investments in traction and rolling stock fleets, covering hundreds of vehicles.

However, changes to the tendering process have led to our client discussing joining another consortium. Should anyone reading this newsletter have something to offer (e.g. capital, rail manufacturing or operating expertise) and wish to join the concession team, we would be glad to hear from them.

Project News: National

Estimating Revenue at Risk

For passenger Train Operating Companies (TOCs), ensuring that they collect all the fares due to them is key to commercial success. In a franchised environment, this could be the difference between achieving ongoing revenue targets, not doing so – and going bankrupt.

Over the last few years, we have undertaken a number of projects about revenue at risk, including both the fieldwork (which we have sometimes contracted out to partner companies such as Transport Investigations Ltd) and the analysis, which is our real field of interest.

Although figures of "% of passenger revenue lost" are often bandied about, it is not clear to us that sufficient care is always taken about the underlying assumptions.

First, good sampling is required, in order to ensure that any conclusions which are derived from factoring up survey results are based on representative data. This normally means some form of stratified sample, across routes, times of day etc. It is also particularly important to ensure that survey staff record the exact location of responses, as (unlike in airlines), passengers can get on and off en route, and some tickets will be valid at location x but not 5 minutes later, when the train has stopped again.

However, there are a number of further complications, especially in the British context of ticket inter-availability and a complicated fares structure. British TOCs base their income on allocations from the LENNON database, which itself has a number of errors. Adjusting as appropriate, the 'base' level of revenue relates to the total ticket fares valid on that route which, where there are alternatives, will only be a proportion of that actually paid. Similarly, the base revenue from season tickets needs to be proportioned down to the yield/trip.

Establishing the exact amount of the fare *not* paid is also difficult. Even if one believes the origin and destination claimed by fare-dodgers, which of the many fares available would be the appropriate one for the trip being claimed? Which of those can actually be sold on the train?

Accurate estimates of revenue at risk at one location then need very careful weighting, in order to provide results at a higher level of aggregation (e.g. TOC totals). Nevertheless, the real benefit of this type of work lies in the accompanying observations and recommendations as to where TOCs might best use their revenue protection inspectors, in order to check the highest proportion of revenue possible. Some managers and civil servants assume that installing ticket gates immediately solves the problem – but it doesn't *(although we're not going to tell the general public why!)*

Others think that the future lies in mobile technology. All we can say is that that isn't fraud-proof either *(again, no secrets told!)* and that continued vigilance, supported by appropriate scientifically-based analysis, is required.

Consultancy Comment

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.

We were pleased, during the last year, to celebrate our 21st birthday, and can report that we now have had 233 clients in that time. This includes *all* the mainline passenger TOCs in Britain except two!

Nigel G Harris

If you want to contact specific members of staff, please use the e-mail convention:
firstname.secondname@railwayconsultancy.com

Publications

Both still available from www.anharris.co.uk:
"Designing and Maintaining the Urban Railway" and "An Introduction to Railway Operational Planning".