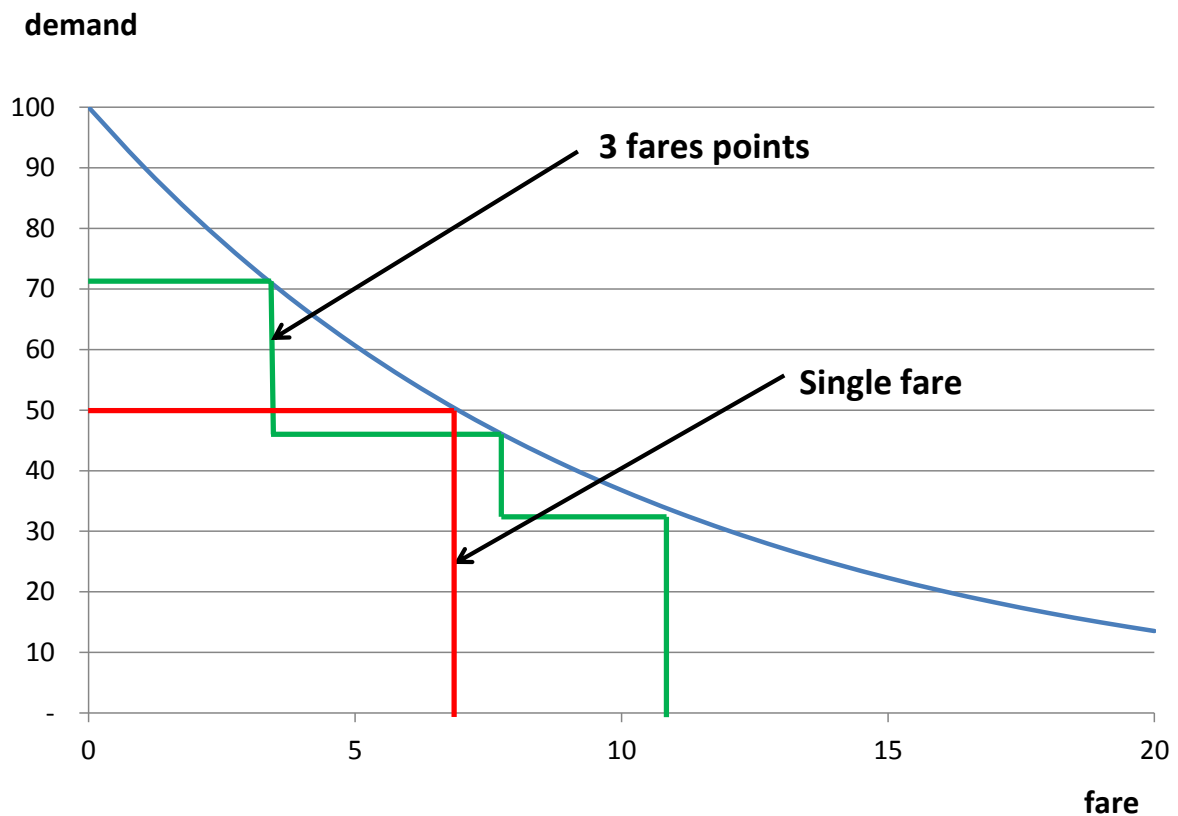


The Transport Economist

The Journal of the Transport Economists' Group



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Rail fares policy

John Segal, Independent Travel Consultant

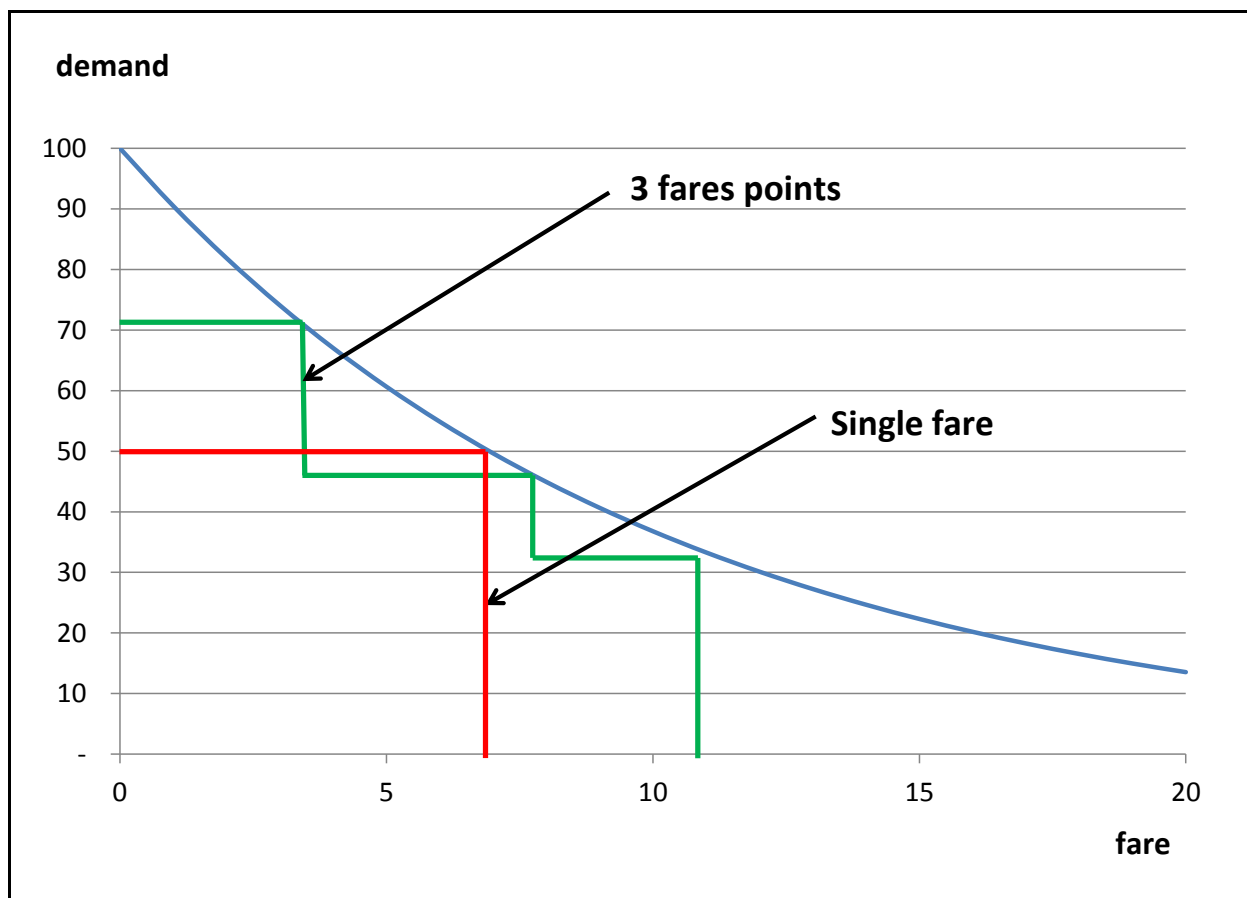
Arup

26 March 2014

Introduction

The speaker began by saying that he would give his thoughts on rail fares policy based on 40 years in the industry working for British Rail, Eurostar, MVA Consultancy and recently as an independent consultant. He has advised many parties on fares policy including ATOC, Train Operating Companies (TOCs), franchise bidders and overseas railways, and has undertaken considerable market research as part of various studies.

Figure 1: Market segmentation



Why not simply charge X pence per mile as some European administrations do? Because we can better meet our objectives; but what are these objectives?

There are commercial objectives, particularly maximising (net) revenue. This could be done by segmenting the market into:

- Those with high willingness to pay, generally those travelling on business
- Commuters
- Discretionary travellers, generally those on leisure trips

The lower fares would be charged at off-peak times when the marginal cost of additional passenger is close to zero, with higher fares at peak times.

The Government also had economic objectives, such as ensuring that cities work, and that commuting was reasonably priced, and reducing car traffic for environmental reasons. It also had social objectives such as affordable and accessible travel for those without cars. It was therefore possible to make a case for subsidies.

The speaker then asked what passengers wanted and said that he had looked at market research and gave two quotes from Passenger Focus.

“Our in-depth study has found that there is clearly an appetite for smarter ticketing among commuting rail passengers, both in terms of moving the ticket format from paper tickets for added convenience, and being able to access more innovative and flexible ticket types as a result, so saving money” (July 2013).

“If passengers can make an informed choice, in full knowledge, if they need it, of all the options and then, having bought a ticket, are clear about what they have bought, this should really help boost value-for-money ratings and trust.” (November 2013).

They actually wanted lower fares, simpler, easier to use fares and ticketing, choice, and to be able to understand what they have bought. There is trade-off between simplicity and choice.

It is unlikely that most people understand the tariff structures for other commodities such as mobile telephones. There is also

growing recognition that simpler structures can mean less choice and hence that the lowest fares are more expensive.

There are varied reasons for people travelling by train and the journeys that they make are very different. It does not make sense to expect an identical fares structure for London to Watford and London to Manchester. The speaker said that he would therefore propose separate structures for short and long distance fares, as it was not possible to write an overarching fares structure, although there will be a need to manage the interface between the two.

Short distance fares

These are mainly for high frequency services in urban areas and passengers will often turn up and go. Passengers will not know which train they expect to catch and it will not be possible to reserve a seat. Trains are generally crowded at peak times, mainly with commuters, with plenty of space off-peak, when there are mainly leisure passengers, although there will also be some people travelling on business.

The main priority of passengers is ease of use, but affordability is also important.

Under the old structure, you purchased a full fare ticket if you wished to travel before 09:30 (or arrive before 10:00) with a cheaper ticket if you travelled later. Within London this structure had been replaced with the advent of Oyster. The Oyster structure is single-based with peak (06:30–09:30 and 16:00–19:00) and off-peak fares and daily capping. The level of capping depends upon whether you travel in the peak or not, but not on which modes are used (unless travel is confined to bus) so that it treats journeys by National Rail and the Underground equally. Oyster does not widely publicise when the peak is, and very few know that travelling before 06:30 was off-peak.

Leisure passengers rarely wish to travel in the morning peak, but some do like to return in the evening peak. Should we offer discount fares when those on full fares are standing?

Passengers really like the ease of use of Smart ticketing and are not generally concerned if they do not fully understand the

structure: it is sufficient that they know that it is more expensive in the peak.

Passengers also like the multimodal nature of Oyster, but capping could be offered at a lower level for National Rail services, as for bus.

The speaker then outlined what his short distance fares structure look like. It would be single-based and a fare from Zone 6 to Zone 1 might be £6 peak and £4 off-peak. There would be a daily cap of £13 peak and £9 off-peak which would allow additional journeys at a small additional charge.

If preferred the £9 cap could also apply if no trip towards the city centre is made in the morning peak. This gives a similar offer to a cheap day return, but with some incentive to travel off-peak in the evening.

All discounts require a smart card. Generally only two groups use cash: visitors and poor people. There are social issues for poorer people who travel infrequently and do not purchase a smart card, but he does not have an answer for this.

Season tickets are popular and appropriate for regular commuters. Weekly season tickets could be replaced with weekly capping. What about flexi-season tickets with discounts if you do not travel or if you travel off-peak? This incentivises off-peak travel and working at home, and was popular with commuters in market research, as they thought that they would pay less. It would require touching in and out for all journeys, which is not currently required with season tickets where gates are not in use. However, it would result in lower revenue for TOCs and hence Government. Evidence shows that the resulting peak-spreading does NOT compensate for the loss of revenue: the speaker estimated only around a third. The main winners would be those who can work flexibility, who are generally the higher paid.

It is eventually a government policy decision: which groups do you wish to subsidise and by how much? The Department for Transport has asked for proposals for a trial of flexi-seasons which would help those who don't travel five days a week.

They often don't travel on Fridays, which are less busy anyway, and it may not help Monday to Thursday loadings, which determine the maximum load factor.

Short rural fares would be similar to short urban fares, but it might be possible to eliminate the peak fare. As travel is generally less frequent it might not require a Smart ticket, although the speaker hoped that everyone resident in the country would have a Smart plastic thingamajig that could hold money and be used as a ticket.

The speaker then discussed Government policy and regulation for short distance fares.

The main focus is on commuters, in order to get cities to work and to reduce highway congestion. However, a system needs to cover those who do not work five days a week: hence the need to regulate day fares as well as seasons. Market forces (the elasticity of demand) should lead to lower off-peak fares without the need to regulate them. The current nature of regulation is broadly appropriate for short distance flows.

Long distance fares

Train services are often less frequent, but many routes now have two or three trains per hour. There is a mix of business and leisure, and commuting on some flows. Higher fare levels mean that people will shop around for cheaper fares: price becomes more important than ease of use. Seat reservations, guaranteeing a seat, are important.

People are willing to pay a reasonable amount for flexibility, and more for peak services. However the speaker pointed out the services charged as "peak" today are often not the busiest: the real peak is on Friday and Sunday afternoons.

Today's fares structure sees very high fares in the business peak and, on some routes, very high single walk-up fares at all times of day. However, advanced fares are widely purchased, including by business travellers.

Most people are confused: how many people know that they can transfer an Advance ticket before departure for a fee of around £10, or understand which trains they can travel on with off-peak and super off-peak fares?

The system does not always look after the most valued customers. For example a business traveller who has bought the most expensive fare, an Anytime return with a reservation on the 17:30, might wish to leave on an earlier train if her meeting finishes early. She could catch the preceding train, but might not get a seat on it because they had been sold to people at lower fares. Does she risk standing or wait for the later train? This problem will get worse as demand increases and trains get more crowded.

There are issues with the current fares structure. Segmentation with high fares for business travellers and lower ones for leisure travellers is flawed, as many business travellers purchase Advance fares. Indeed, as high a proportion of business passengers as leisure ones book Advance tickets.

The railway is increasing frequencies but encouraging people to buy Advance (single train) tickets. This is bad for passengers and results in crowded stations as people arrive a long time, often 30 minutes, before their train. In addition, to increase their flexibility, some people buy two Advance tickets, which is still cheaper than an open ticket. This does not make the most of the unique selling point of rail, which is frequency and flexibility.

There is a complex mix of singles and returns and many "peak" trains are relatively empty and "off-peak" trains full.

It makes sense to move to a single-based strategy. There is no market reason for returns not to be twice the single fare, and it is easier to understand. The current return is mainly because of regulated off-peak or super off-peak (Saver) fares: it is not clear that there ever was a reason to regulate this fare, but it is now too cheap and distorting the rest of the structure. It would be much better to regulate an off-peak single fare.

The speaker suggested three pricing periods, or possibly only two on some routes (trains could be colour coded):

- Business peak
- Leisure peak
- Off-peak (quiet times)

There would be three types of flexibility:

- Fully flexible refundable fares, at a high price, equivalent to current walk-up fares
- Semi-flexible, which can be changed before departure (probably for free, but possibly for a fee)
- Non-flexible, which is what it says on the tin

Seats would be reservable up to a few minutes before departure, and passengers could change seats if one were available. They could still stand, but would know in advance that they had to do so, and could make an informed choice. This would require a modest enhancement to technology.

There is a good case for First Class and Standard and possibly an intermediate class as Eurostar has: if people want to pay for added luxury, why stop them? The catering offer should be decided by the operator. The intermediate class might be appropriate if First Class includes full catering, and would address company travel policies restricting use of First Class. In reality, a significant reason for purchase of First Class is to be segregated from those you don't wish to travel with.

Both semi-flexible and non-flexible prices would vary by how far in advance they are purchased: most business travellers purchase within the last week, some leisure travellers purchase earlier. The elasticity of demand reduces as the day of departure approaches, even within the leisure market. The approach allows revenue management: do not sell seats at a low price if it is expected that they could be sold at a higher price. All except fully flexible fares must be purchased by midnight the day before travel: one TOC is selling Advance fares on the day of travel, which does not seem sensible, except that it may be to affect ORCATS allocations.

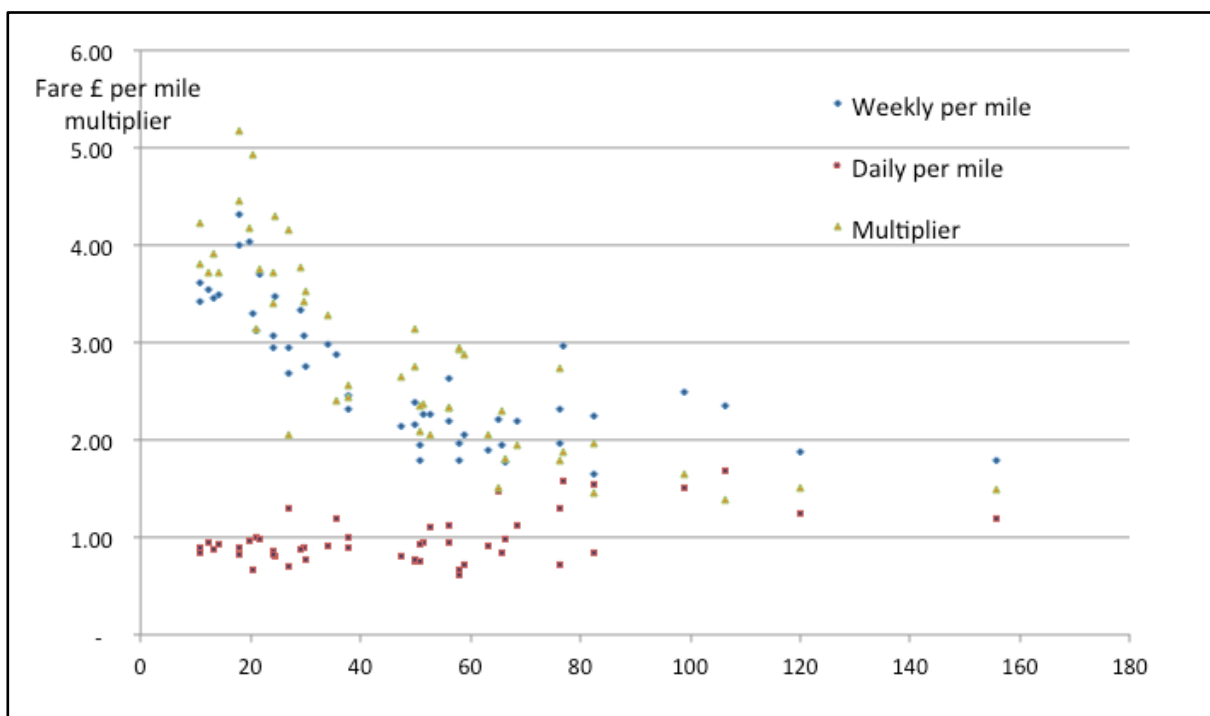
Indicative prices are shown in Figure 2. The proposed structure has the advantage of being simple to understand, with low prices at off-peak times for the leisure and book-ahead market, and reasonable walk-up prices at off-peak times. This should give high yields from business travellers, while a modest increment for semi-flexible tickets should encourage a number of people to trade up. This makes the most of the railway's unique selling point of frequency of service.

Figure 2: A possible fares structure

		Red	Amber	Green
	Fully flexible	£100	£60	£40
1 day before	Semi-flexible	£80	£50	£35
	Non-flexible	£70	£40	£30
10 days before	Semi-flexible	£50	£30	£20
	Non-flexible	£45	£25	£15
6 weeks before	Semi-flexible	£30 *	£25 *	£15
	Non-flexible	£25 *	£20 *	£10

Long distance commuting has been growing, and current season ticket prices offer a large discount: a weekly season is often less than twice the Anytime return fare. This is in part due to the large rise in Anytime fares since privatisation, and in part due to the historic precedent from BR, when trains were slower and few people commuted more than 100 miles.

Figure 3: Variability of fares with distance



It is probably right to regulate season tickets, but why should the taxpayer subsidise long distance commuters so much? The speaker recommends that the multiplier is always more than two and generally more than three, but this would need to be phased in.

At locations such as Peterborough and Reading, the regulated seasons could apply to the slow trains rather than to the Intercity ones. There could be a supplement for travelling on faster trains such as HS1 at Ashford.

Most significant long distance commuting routes have a slower alternative, and it would avoid the distortion to longer distance (true) Intercity services: almost all services from Cardiff and Bristol call at Swindon and Reading.

When it comes to the regulation of long distance fares, there is no need to regulate Advance fares where the market has demonstrated that it will ensure that cheap fares are available. The Government can choose to regulate off-peak fares (either fully flexible or semi-flexible – green or green and amber), if it wishes, but it is not clear that there is a need.

Long distance seasons should be regulated, but the price per mile should be increased to be similar to those for a shorter distance over a period of time. There is no justification for additional subsidy to these markets.

It is not easy to define middle distance markets, but it is probably best to think of them as no seat reservation, outside a single urban area. These typically have long off-peak periods when space is always available on trains. Advance looks less relevant without seat reservations, but some operators such as Southern have successfully introduced such fares. It would be possible to make Advance fares valid for (say) a two-hour window, or even the whole of the off-peak, rather than an individual train. The restriction would be that they were not refundable and must be purchased the day before.

There is no purpose in having a semi-flexible fare, which is only relevant where a seat can be resold. It is therefore recommended that there are peak and off-peak fares, walk up, and possibly Advance fares, but they would not be train-specific.

Nearly all public transport operators in all countries offer discounts and even free travel to children. However there is no economic or social reason: if it were about affordability, why not extend it to all school age children? However it is a reasonable policy, and there is no good reason to change it.

With the exception of the Disabled Railcard, Railcards are commercial offerings making money for the railway, as they target price-sensitive markets and the purchase price makes a significant contribution. Most are loosely regulated. The railways have just introduced a new Two Together Railcard, for people who regularly travel together, as a commercial venture.

Conclusions and recommendations

The speaker concluded that fares policies are a combination of market pricing and politics, resulting in subsidising specific segments, especially commuters. It has come about in part owing to accidents in history, particularly reflecting the position in 1994, is a trade-off between segmentation and complexity, and is to some extent restricted by technology.

Market pricing and appropriate subsidy is good, politics is inevitable. However it was important to avoid historical anachronisms, whether in structure or technology, and to err on the side of simplicity when deciding on the fares structures.

He made the following recommendations:

- For daily tickets adopt a singles-based strategy in all markets, with peak and off-peak and possibly an intermediate band in long distance markets. Adopt Smart Ticketing for short distance markets, with daily and weekly capping. The price cap can mitigate the evening peak issue, where it is not currently considered as peak. In the long distance market, distinguish the market by flexibility, with possibly three tiers, and give seat assurance. Non-flexible and semi-flexible tickets should be cheaper the longer ahead they are booked.
- Seasons tickets should be regulated. However, the current rates at long distances are too low: there should be a similar rate per mile to short distances. There could be an option of flexi-seasons offering a discount if you travel off-peak or less than five days per week, but these will lose money, so it is a political decision.
- Child discounts and Railcards should continue: the last are a commercial offer.

Discussion

Nigel Harris (The Railway Consultancy) said that in the example the cheapest fare was less than a tenth of the most expensive one: do high walk-up fares deter usage? The speaker replied that the marginal cost of seats that would otherwise be empty was very low, and that cheap headline fares were worth having, so the differential was probably about right.

Scott Clyne (PwC) said that he did not believe it right to subsidise commuters, including short distance ones, and that it would tend to distort the optimal size of city. Those who benefit from a service should pay the full cost, and if you hold down fares it will not permit adequate investment. John replied that the benefits to London are seen across the whole country. London has one of the lowest levels of subsidy in Europe. The level of subsidy is much higher outside London, but the level of infrastructure spend is, of course, much higher in London.

Margherita Rendel (Torbay Line Users' Group) asked about carnets for infrequent travellers. John replied that TOCs such as Scotrail and First Capital Connect sell carnets of tickets. He was not against, it if it had market potential, but it was not part of the regulatory framework.

John Dodgson wondered how many decisions on fares came from economic modelling and how much was judgement or hunch. John replied that all decisions involved judgement, but that it was informed by modelling. For example, he had done work for a TOC that showed that fares elasticities generally increased closer to the time of departure, as a result of which they had increased some Advance fares.

David Spurling asked why a fare such as Sittingbourne-Loughborough was cheaper than one for Sittingbourne-London. John replied that there would always be anomalies when switching between different structures for short and longer distances. One answer would be to treat it as two journeys and for the fare to be the sum. David also noted that there could be standing on late night trains which might only be formed of four vehicles. John felt that this was a case of poor management.

John Cartledge (London TravelWatch) began by commenting that, while he believed in a classless society, one advantage of

having First Class is that you could avoid those who purchase First Class tickets. He then commented that there was often a fares penalty for having to switch modes: for example it was cheaper when travelling on National Rail routes to buy a ticket to London terminals only, whereas LUL tickets automatically included onward travel. John replied that this was an accident of history, but including free Underground travel would increase congestion at some key Underground stations. Certain National Rail routes such as c2c were fully integrated.

John Cartledge also asked if we could learn lessons from the Japanese system of reserved and non-reserved coaches? John said that the norm was that you would get a seat for long distance journeys.

Stephen Bennett (Transport for Scotland, retired) noted that there was increasing balkanisation with the existing system, and wondered if increasing local control would help. John replied that the problem was probably ossification. Market conditions have changed since the situation in 1994 was used as the basis for regulation, with the internet responsible for far more sales.

David Starkie said that he had a lot of sympathy for raising the cost of long distance commuting, but commuters had committed themselves to a mortgage and he wondered if it would be politically possible. One solution would be to have a higher price for new users. John replied that it would be possible, and indeed was a McNulty recommendation.

Richard Davies (Rail Delivery Group) asked if there should be a national fares structure, or whether we would be better off with a regional one? John replied that we have a national structure because we have a national network, and that most people would not know who their local operator was. However it could be tried out, and has been, in places such as London.

Richard also asked wondered why TfL uses fare capping. John replied that TfL introduced it to avoid users having to calculate whether it would be cheaper to purchase a one day Travelcard, the rationale being that you would never be worse off.

Report by Peter Gordon

Developing the Department for Transport's approach to model uncertainty

Alice Crossley, Head of Profession, Department for Transport

Arup

23 April 2014

Introduction

Alice summarised her experience, beginning with a PhD in experimental physics at Imperial College, a move to computational physics at the Met Office, and time at London Underground and TRL, before joining the Department for Transport 6 years ago. She now heads the development of WebTAG.

WebTAG draws on a robust evidence base drawn up over a long period, but the world is changing and funding is now being made available for further work on incremental improvements. Three key themes have been identified:

- Economic growth, with an April 2014 workshop on "Transport Investment and Economic Performance", with three experts reviewing whether we are still correctly capturing impacts
- Valuing journey improvement (value of time), with new Stated and Revealed Preference work to begin in June 2014, and preliminary resulting in spring 2015
- Uncertainty and risk, the subject of Alice's talk, for which a project was now being scoped

A workshop on evaluation would also be held in June 2014.

Establishment of a Transport Modelling and Appraisal Panel of experts and stakeholder representatives was also at the planning stage.

Alice stressed that much of the work was still at stage of initial thinking, and not much had yet been done.

The remainder of her talk would cover:

- Estimating model uncertainty and applications in transport modelling
- Modelling long term benefits growth
- Scenario analysis
- Evaluation, and the link to appraisal
- Conveying information on uncertainty to decision makers, the purpose to which all the other work would lead

Estimating model uncertainty

Costs and benefits of schemes are forecast with models, every one of which will contain an error (ϵ). Statistical uncertainty represents the spread of a number of individual forecast errors.

The key risk is that the decision advice is materially different as a result of these errors, but both size and likelihood of this risk are normally unknown. To understand the risk it is necessary to estimate the size of the statistical uncertainty in the appraisal process.

Alice illustrated the scale of recent forecast error, calculated as “(Forecast–Actual)/Actual” with the examples shown in Table 1.

Table 1: Examples of forecast accuracy

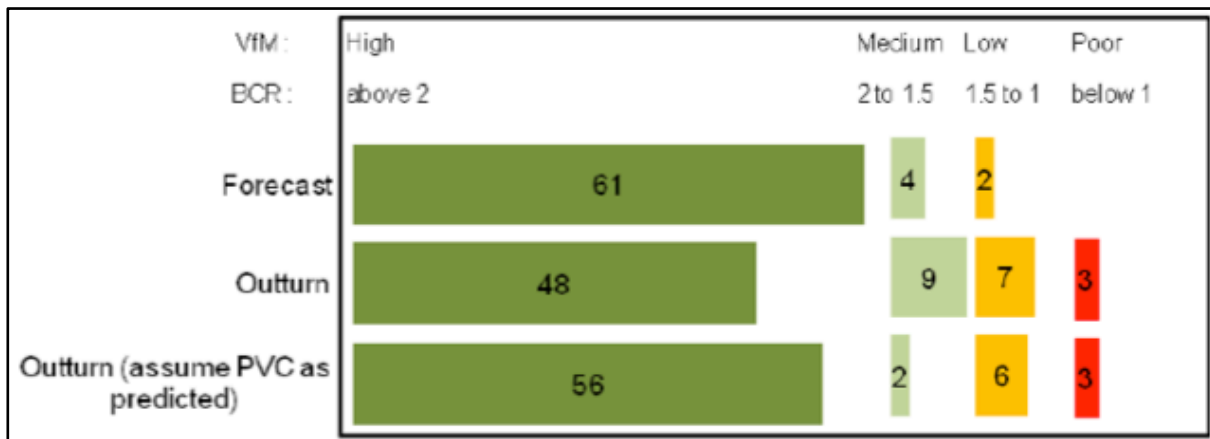
Model	Forecast year	Outturn year	Years	Error
National Transport Model	2007	2011	4	+8%
Rail demand model	2006	2012	6	-7%
Aviation model	2007	2012	5	+30%

Note: National Transport Model (NTM) forecasts are in vehicle-kilometres, rail demand model forecasts are in passenger-kilometres

She noted that, compared to NTM, rail demand and aviation are successively smaller markets and, all other things being equal, one would expect higher volatility and forecasting error.

The Highways Agency had also compared the forecast value for money with the actual outturn, and the outturn assuming that the cost estimates had been accurate, as shown in Figure 1.

Figure 1: Examples of scheme Value for Money (VfM)

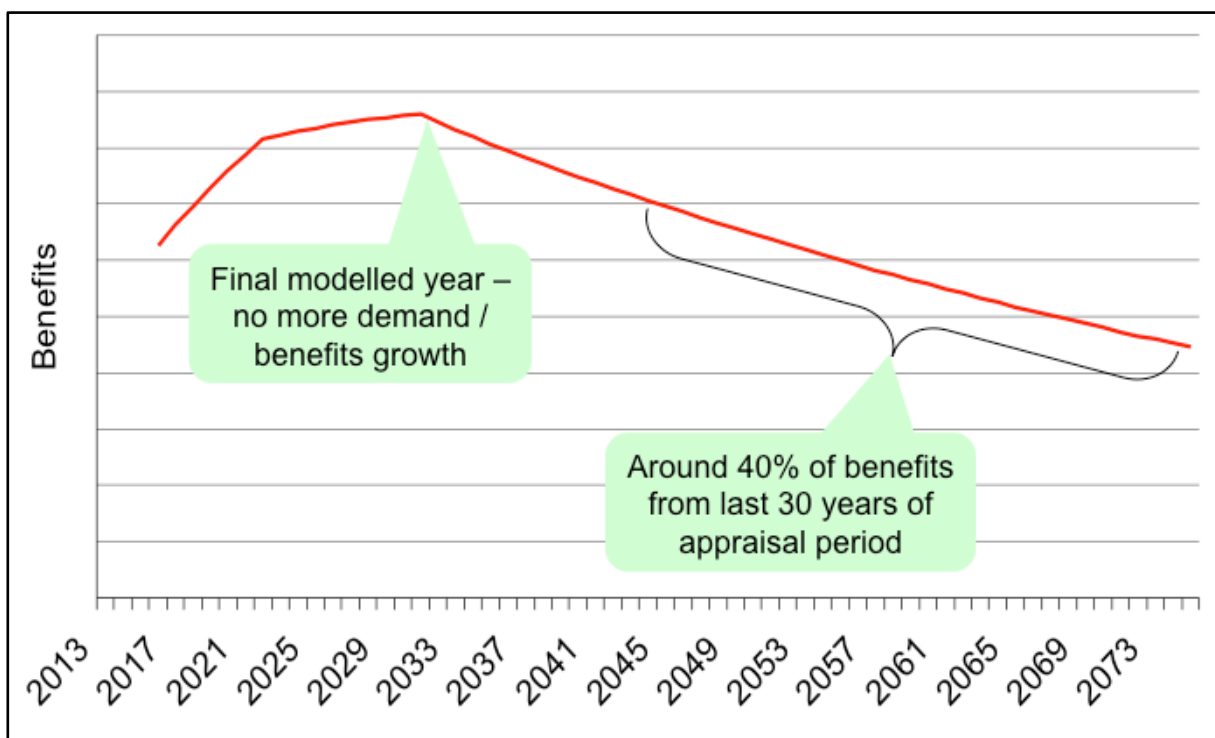


Source: <http://www.highways.gov.uk/publications/pope-meta-report-2013/>

This analysis suggested that a number of schemes forecast to have high VfM actually achieved only low or poor VfM.

Uncertainty is important because of the extent to which benefits occur in the later part of the appraisal period, as illustrated in Figure 2 for a generic scheme.

Figure 2: Illustration of benefits late in the appraisal period



Alice suggested that cumulative uncertainty might become large when individual uncertainties might be of the order of:

- $\pm 15\%$ uncertainty in demand forecasts

- $\pm 25\%$ uncertainty in valuing journey time savings (VoT)
- $\sim 10\%$ uncertainty (underestimate) in cost forecasts

With uncertainties of this size, the uncertainty in the final forecast would clearly be material, and it was essential that this be conveyed to decision-makers.

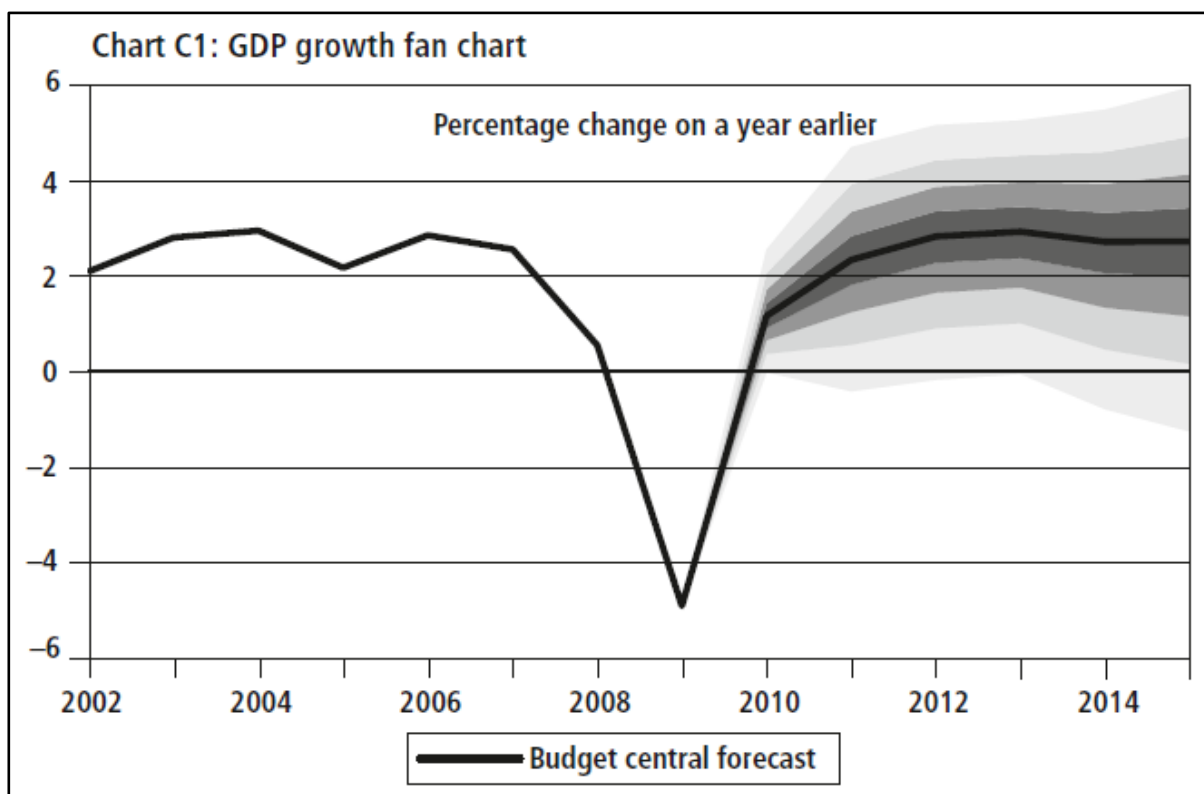
Estimating uncertainty

Alice identified two steps to estimating uncertainty:

- In input variables such as GDP, which are imperfectly forecast.
- In model parameters, such as the modelled relationship between forecast GDP and demand. This is called the model uncertainty.

Once identified, it is possible to estimate how they propagate through the forecast model. One well-known example is the Office for Budget Responsibility's (OBR's) "fan" chart of GDP, illustrated in Figure 3.

Figure 3: Presenting GDP uncertainty with a "fan" chart

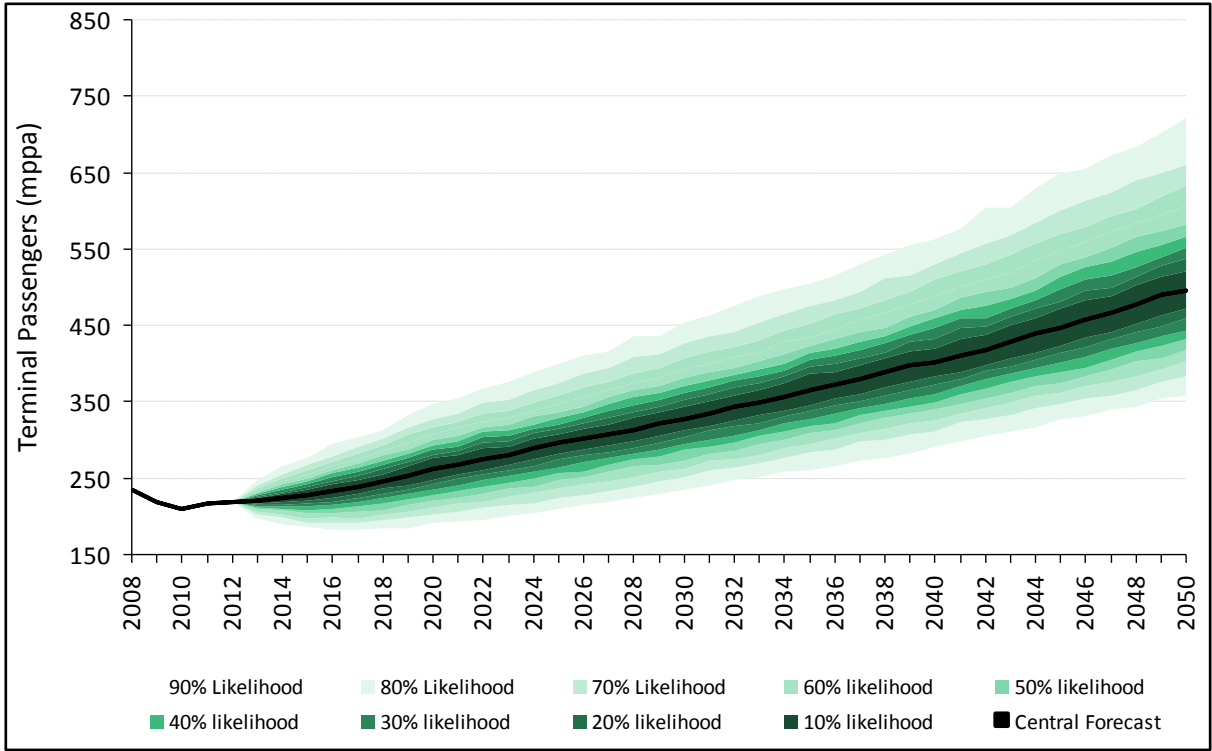


However, it had proved more difficult to identify uncertainty in model parameters.

A common problem was that original research had not preserved the source data, or had itself been based on an amalgamation of earlier sources. There may therefore be a need to repeat some research to collect data from which to derive robust estimates of the uncertainty in model parameters.

Given knowledge of the uncertainties, it is next necessary to identify how they propagate through the model. For non-linear models with non-Gaussian inputs, such as those used to predict the paths of cyclones/hurricanes/typhoons, the approach used is "ensemble forecasting". The inputs are varied, the calculations are rerun and, as with Monte Carlo simulation, a range of outcomes is modelled. Monte Carlo analysis of the National Air Passenger Demand Model produced the results shown in Figure 4.

Figure 4: Monte Carlo forecasts of air passenger demand



Error propagation

The second step to estimating uncertainty is understanding error propagation. This is, for example, relatively simple for the rail demand exogenous forecasting model.

With little information about input errors, it is assumed that they are normally distributed and independent, and it is then possible to deduce analytically the uncertainties in the outputs. For example, the variance in output y derived from variables x_1, x_2 and so on is

$$\sigma_y^2 = \left(\frac{\partial y}{\partial x_1} \sigma_{x1} \right)^2 + \left(\frac{\partial y}{\partial x_2} \sigma_{x2} \right)^2 \dots\dots$$

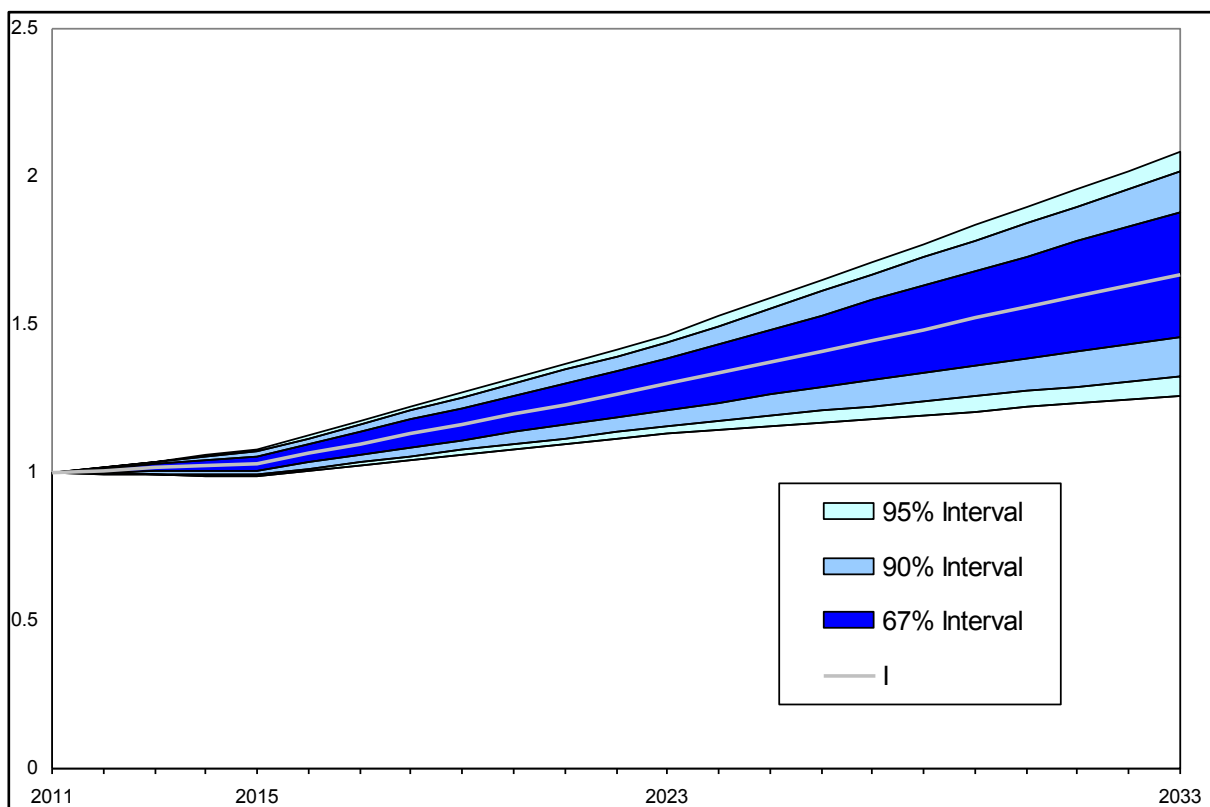
Taking an equation such as

$$I = (G)^g(P)^p$$

where G is GDP and P is population, it is easy to derive the partial derivatives of I with respect to G and P .

Assuming small random variables, it is therefore possible to derive the uncertainty in an individual rail flow analytically within an Excel spreadsheet, as illustrated in Figure 6, which shows a standard deviation of 11% after 20 years.

Figure 6: Uncertainty range around an individual rail flow



In summary, so far this approach has:

- Identified that more data is needed on uncertainty on key drivers and model parameters
- Demonstrated two-way understanding error propagation

These methods can be applied to transport forecast models, and ideally automated, to estimate uncertainty.

Modelling long term benefits growth

Long term forecasting is subject to increased uncertainty, particularly with the current appraisal period of 60 years. Transport models do not forecast out to 60 years, because of:

- Difficulty in defining detailed infrastructure (and, for rail, services) that far out
- Limited resources, which often constrain the number of modelled years

This raises the issue of what happens beyond the final model year (which may be on the left half of Figure 2).

WebTAG current guidance recommends that benefits are extrapolated beyond the final modelled year in an evidence-based manner, on a scheme-by-scheme basis, and that there is a core sensitivity test in which benefits are fixed after the final modelled year. However, approaches vary by mode, as summarised in Table 2.

Table 2: Approaches to final model year and demand capping

Mode	Final model year or approach
Highway and local public transport schemes	15-20 years after scheme opening
Rail schemes	20 years after appraisal, then cap demand as a driver of benefits
Aviation	No cap, but demand is reduced over time to represent market maturity
Walking and cycling	No formal cap, as schemes are modest and frequently have short appraisal periods

However, following the final year or demand cap, benefits will still change as a result of changing living standards, through the value of time. These benefits can then be discounted.

The various approaches in Table 2 are rules-of-thumb but not evidence-based, and consistency between modes would allow better comparison between schemes. In the absence of evidence for market saturation, adopting the core sensitivity test as the default will underestimate the benefits.

A further issue is capacity constraints, the effect of which may be felt at different times in Do-Minimum and Do-Something, typically leading to underestimates and overestimates of the benefits respectively.

The current approach tends to involve complex models of both demand and supply to forecast the growth in benefits, but at some point there must be limited returns to running them, such as when the error in the model becomes larger than what is being measured. At this point it will be appropriate to move to a simpler model. This currently involves fixing annual benefits after the final modelled year, with growth in benefits resulting only from changing living standards, through the value of time.

Alice wondered whether it would be appropriate to consider an approach based on uncertainty. The ideal approach would be:

- Combine complex transport modelling and a long term trend model
- Weight the contribution by uncertainty in both forecasts
- Sum over the appraisal period
- Produce both **benefits** and a **range** or level of uncertainty
- Carry out all calculations of BCR \pm a range

DfT recently procured research "Specifying the Demand Cap for Rail" (Bates, Worsley, Wardman, Nash, Preston (2013)) which:

- Summarised the evidence for market saturation (very little evidence was found)
- Set out options for applying a demand cap, including short appraisal periods, and specifying a demand cap in terms of a level of demand (as had been used for HS2)

- Considered what happens after the cap, such as whether benefits after the cap year should rise with population

This suggests that a background growth model could be based on:

- Long term trip rates, for rail assuming a reversion to long term trends, which since 1946 have averaged 0.21% pa
- Population growth, with benefits growing pro rata with population plus income growth and an associated elasticity

A key requirement is to forecast uncertainty, which should be based on comparison with actuals, from backcasting the evidence over many years.

Summary

Summarising the above, it is possible to:

- Identify uncertainty in inputs and model parameters
- Model the propagation of uncertainty
- Predict long term benefits

The last stage can be by running complex models until they provide no additional information, defining the long term benefits growth and understanding the uncertainty in it, and combining the forecasts using uncertainty.

Development areas for WebTAG under consideration are:

- Consistency of approach
- Input uncertainty
- Guidance on appropriate methods to understand how errors propagate through models
- Longer term research on understanding and developing long term growth models

Scenario analysis

Forecasting cannot consider the unanticipated, or the effects of policy changes. The approach needed is therefore to identify potential external factors and to model them with scenarios. One example is home working: people may have a higher

propensity to work at home in future, and this could influence trip rates over time.

- Development areas for WebTAG will be around undertaking some case studies to define broad transport relevant scenarios
- Considering whether principles can be developed for building and using these transport scenarios
- Linking the scenario work with the statistical uncertainty work discussed above

Evaluation and the link to appraisal

Alice sees evaluation as a big issue, and said that there is a need for it to be planned. DfT proposes to provide guidance on measures which can be collected and which will relate back to the specific building blocks of appraisal, such as journey time or crowding. The aim will be to help projects to identify metrics and to develop effective counterfactuals that can evaluate economic appraisal. The approach is:

- To develop case studies with embedded analytical teams which will use current schemes to identify metrics and approach
- To use this to identify common themes to inform guidance development

Conveying uncertainty to decision-makers

Value for Money (VfM) guidance requires that a range is given, but consideration is needed of how to present potentially large amounts of information to decision-makers. This could take the form of a fan chart, as shown in Figures 3 and 4, or a bar chart, as shown in Figure 6 for HS2.

However, there is a need to avoid presenting a false sense that all uncertainty has been captured, such as the potential impact of fracking on oil prices.

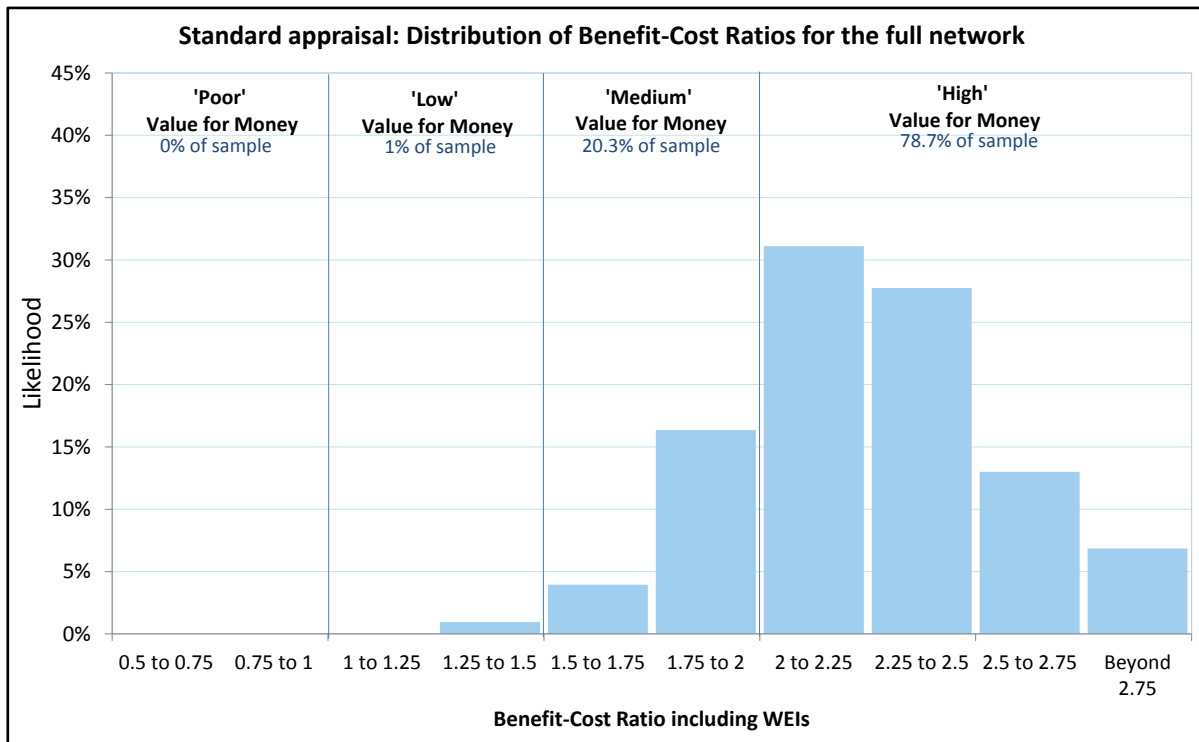
In summary, WebTAG guidance will be developed to address:

- Consistency of approach
- Input uncertainty

- Guidance on understanding the propagation of uncertainty
- Principles for building and using transport scenarios
- Best practice in presentation to decision-makers

For evaluation, the aim is to develop guidance to help projects identify metrics and develop effective counterfactuals that can evaluate economic appraisal.

Figure 6: example of presentation of uncertainty in VfM



Discussion

Peter Gordon noted that the discount rate used to be 7%, resulting in discount factors of roundly $\frac{1}{8}$ after 30 years. **Alice** responded that discount rates are now around 3%. **Peter** also asked if scenarios for rail could consider the decline in young drivers. **Alice** said that this would be discussed at the National Transport Model session in July.

John Bates said that the issues had been around for a long time: Tom Worsley had commissioned work from him in this area 30 years ago, which took into account correlation between variables. Why had it taken so long to address them, and would we avoid a further 30-year delay? He was not convinced that

Alice had correctly characterised the issue of when complex models no longer add information.

Stephen Plowden considered that, while sophisticated, what Alice had presented was still a variation on trend planning. There was no mention of global warming, which may need a different approach. It was important to get the base right before considering the long term. **Alice** suggested that global warming issues could be handled through scenario analysis. **John Bates** said that this meant appraising policies, not just dealing with more travel. **Tom Worsley** said that Ministers were free to consider other policies and schemes: the models deal with what to propose. John Bates' original work had not been used as "Ministers found it too difficult": witness the spuriously exact figure of 1300 new vehicles set out in the 2008 HLOS. Are Ministers more sophisticated now?

Stephen Glaister supported the approach, and liked the presentation of HS2 VfM shown in Figure 6, but felt that covariant risk was underplayed, particularly when demand, value of time and safety benefits are all driven by income. His concern was whether long term trend analysis should look at the issue of regret, which might modify choices or designs, as had been identified by the Leitch Committee's 1975 suggestion that motorway bridges could be build wider to minimise the costs of widening.

Tim Gent (WSP) found the approach fascinating, but wondered whether focus on the analytical approach had lost sight of the objectives. The man in the street doesn't understand probability, and local authorities are obsessed with growth. **Tom Worsley** noted that there are also issues of game theory when local authorities compete for a fixed funding pot.

David Metz (UCL) noted that statistics can't cope with changes in behaviour, technology or policy, but wondered how statistical and scenario uncertainties would be reconciled, particularly if the latter were much larger. **Tom Worsley** countered that behaviour showed some stability - the internet had not replaced travel, and TV had not replaced cinema - and wondered what David would advise. **David** suggested a focus on saturation as a phenomenon, and a test for robustness.

Michael Spackman noted the focus on statistical uncertainty, but wondered about ambiguity. Ministers do not want more information. **Alice** responded that it was still possible to present a range.

Stephen Glaister asked about computational issues: could models be constructed so that the necessary analysis was faster? **Alice** agreed that this was not easy, and that the NTM was slow. **John Bates** wondered how the models could be simplified.

Tim Elliott (Independent) had used COBA since 1978 and suggested reverting to 30-year appraisal, as few schemes last longer, but agreed there was a need to consider regret: which schemes are consistently good? Stephen Glaister agreed that the low discount rate is a problem: discounting at 3% for 60 years gives a higher discount factor than discounting for 7% over 30 years.

Dick Dunmore (Steer Davies Gleave) had noted that the Environment Agency's hurdle BCR rate for flood defences was 8: should those flooded out be complaining of misallocation of resources to transport?

Peter Gordon asked whether time is correctly valued. **Alice** said that this was "a good way to go" and **Tom Worsley** added that "all will be revealed" in spring 2015.

Stephen Plowden was concerned that the reported HS2 BCR did not consider the impact on the countryside or in Camden, which would suffer traffic disruption for "10-15 years". Atkins had flagged this but it had been removed. **Alice** agreed that economic appraisal should consider these issues. **Dick Dunmore** noted that the Transport Select Committee had been told that environmental mitigation had added to costs, but this at least provided a means of addressing these impacts. **Alan Peakall** pointed out that, without valuing the impacts, it was impossible to know whether the mitigation was cost-effective.

David Metz advocated doing more backcasting. Tom Worsley noted that it was hard to persuade Treasury that lower GDP forecasts should be tested.

Report by Dick Dunmore

International comparisons of Transport Appraisal Practice

Tom Worsley, Visiting Fellow, Institute for Transport Policy,
University of Leeds

Arup

28 May 2014

Introduction

Tom began by saying that he would primarily be discussing two reports, a study by the UK Department of Transport which he wrote with Peter Mackie which looked at international comparisons, and additional information from the European Union-funded Sintropher report.

The DfT report on International Comparisons of Transport Appraisal Practice was published in July 2013 and is available at www.gov.uk/government/publications/international-comparisons-of-transport-appraisal-practice. There are useful tables at the end of the overview report and seven annexes written by local academics.

Table 1: Structure of DfT report

Section	Authors
Overview Report	Peter Mackie and Tom Worsley
Annex 1: England	Guehnemann A, Kelly C, Mackie P, Worsley T
Annex 2: Germany	Guehnemann A
Annex 3: Netherlands	de Jong G
Annex 4: Sweden	Eliasson J
Annex 5: USA	Weisbrod G
Annex 6: NSW Australia	Douglas NJ and Brooker
Annex 7: New Zealand	Douglas NJ, Wallis I, Lawrence A, Wignall D

The Sintropher Report

This stands for Sustainable Integrated Tram-Based Transport Options for Peripheral European Regions and focuses on the options for links between main railway stations, generally those served by high speed lines, and peripheral regions in NW Europe. It is not yet published but an outline is available at <http://www.sintropher.eu/about/partners/university-college-london>.

The website contains a number of reports describing the qualitative research and an assessment of the institutional structures in the various countries covered by the study. The speaker's report covers the use of economic appraisal for local transport schemes in the countries participating in the project.

Context for the DfT and Sintropher Reports

The UK Department for Transport (DfT) faced challenges on the appraisal methods it uses. How does DfT compare with other countries in the methods, framework and values it uses and in the use made of Cost Benefit Analysis (CBA) in the decision-making process?

The method used for the study was to select six countries identified as leaders in CBA and with which the researchers had good contacts. It took the EU HEATCO (Harmonised Approaches to Transport Costing and project Assessment) Report (2006) as a base and reviewed changes since 2006. The team sought guidance and information on use of appraisal in decisions. It took seven weeks to produce the draft report, with a further three for discussion with parties before final publication.

University College London was the lead partner for the Sintropher Report and Sir Peter Hall was the team leader. The focus was on land use planning, with input from the Bartlett School of Planning and French, Flemish, Dutch and German partners.

It examined five demonstration projects in Blackpool, Valenciennes, Nijmegen-Kleve in the Netherlands, Nord Hessen and the West Flanders coastal tramway.

The objective was “Supporting Growth through Regional Connectivity”: how can better tram-based transport links promote economic development at the regional level?

The presentation focused on the report covering economic appraisal methods and decision-making interaction between economist and planners.

Transport Cost Benefit Analysis in the UK

There is a strong tradition over some 50 years. There have been external challenges from ACTRA, SACTRA, Eddington and occasional internal reviews such as NATA (1998), NATA refresh (2008), transport business case (2010) and Understanding and Valuing the Impacts of Transport Investment (2014).

There is published detailed guidance in WebTAG.

The methodology uses evidence-based values, with increasing use of money values to replace quantified or qualitative scores. This has been updated and extended to include wider benefits and impacts such as reliability. It was originally used for highways and local transport capital schemes, but has been extended to national rail, walking, cycling and some current expenditure.

There is also published information about the role of Cost Benefit Analysis in the decision-making process.

Why does CBA remain in favour in England?

The English policy framework supports the use of CBA through various factors:

- the parliamentary process in protecting the public interest: many foreigners find it very strange that members of the Public Accounts Committee will challenge a Government of the same party.
- The dominant role of HM Treasury: Green Book, value for money.
- Accounting officers such as the Permanent Secretary have responsibilities combined with the independence of the Civil Service.

- The low level of local taxation and funding, so that schemes are viewed from a national perspective.
- The public inquiry process.
- A British preference for evidence-based decisions over political ones to demonstrate “fairness”.

Against this there is a desire to demonstrate the impact on the “real economy”, and scepticism about time savings as a proxy for longer term effects, while localism and devolution set different objectives.

Key findings

Appraisal Framework

Most of Europe uses lower discounts rates of around 2.5-4%, and longer periods of up to 60 years, compared to the USA or Australasia, which are typically 7%-8% and generally asset-specific, and rarely extend beyond 30 years. The study did not investigate how the countries in the survey addressed the problem of infinite Benefit Cost Ratios (BCRs), which occur when growth rates in the quantity and value of benefits are higher than discount rates.

The use of shadow prices is rare: only Sweden uses 1.3 for public spending.

Appraisal metrics vary and several are reported for some countries: BCR, Net Present Value (NPV), Internal Rate of Return (IRR), First Year Rate of Return (FYRR), with the denominator either national costs, costs to government or capital costs (Sweden).

The non-monetised impacts vary. They may be presented as additional information in standard reporting format, use to produce a “red flag”, or translated into broad monetised score to provide additional BCR.

Risk and uncertainty also vary. Quantified Risk Assessment (QRA) and/or optimisation bias are used by some countries. The Netherlands uses a risk premium on the discount rate, while Germany uses sensitivity analysis.

The role of the Finance Ministry in setting appraisal standards varies, with some countries delegating powers for local schemes. Some federal countries such as Germany have both national and federal appraisal methods. Länder may use their own local system.

Unit values of user benefits

The values of time are broadly comparable throughout the countries studied. England has a high value of Employer's Business relative to Non-Working Travel Time Savings (NWTTS): now a factor of four compared with around three in other countries, but WebTAG NWTTS is lower than for the Netherlands and Sweden for commuting. Germany weights savings of less than 5 minutes by 0.7, while Sweden weights savings by journey distance. The NL uses stated preference (SP) values in place of cost saving for freight. A higher cost of walk and wait time is applied in England and outside the EU.

For reliability, either reliability ratio or an In Vehicle Time (IVT) based value of lateness (typically around 3) is used. No value is reported for Germany.

For comfort and crowding, Sweden and New Zealand increase the value of time for car congestion. Most countries apply a public transport crowding penalty, some depending on the crowding level.

The treatment of safety is generally comparable, except for the USA, which has Value of a Statistical Life three times the English value. Sweden values serious casualty higher.

Environmental impacts

Monetisation is now widespread, with much progress since HEATCO:

- Noise: Europe generally adopts a willingness to pay approach, with mitigation costs used elsewhere. Methods are not easily comparable: for instance in the volume/value relationship and in area type.
- For local pollution a broadly similar approach is used by all countries, based on impact pathway, damage to health

and a willingness to pay based change in state of health, with some differences in the pollutants measured.

- Climate change: other than Australia, all countries use money values, based on EUETS (EU Emissions Trading Scheme) or a shadow price of carbon. The values for the US and New Zealand are low while those for Sweden high.
- Environmental capital: qualitative assessment to inform Multiple Criteria Analysis (MCA). The Netherlands is considering monetisation.
- Other impacts: Germany applies a mark-up for induced traffic (there is no variable demand matrix), New Zealand applies disruption-related strategic factors, while social and distributional impacts are only applied in the UK WebTAG model.

Wider Economic Impacts (WEIs)

A range of methods are often “additional” to the BCR and there has been much progress since HEATCO:

- Agglomeration benefits: relationship between generalised costs, employment density and productivity are considered in England, Sweden, New Zealand, New South Wales and for some larger schemes only in the Netherlands.
- Regional spatial economic models are used in the Netherlands for large schemes (RAEM, REMI) and in some US states (REMI, TREDIS). These may be too much of a “black box” approach, and it is hard to match the areas modelled for transport and regional economics because the economic data is collected using a much coarser geographical level than is used in the more detailed zonal basis of the transport model.

Germany applies an uplift for cross-border and port connections, presumably because it is a major exporter of goods.

Regeneration (regional/local distributional effects) is only applied in England, Germany for direct employment effects, the US and some New South Wales and is generally not monetised.

Labour supply and the assessment of the move to more productive jobs, both estimated in relation to the change in output, are impacts that are covered only in England.

Applying guidance to capital and current projects

Roads: this is generally mandatory for all capital projects requiring central government funding but varies for state- or locally -funded schemes in the US and New Zealand.

Rail passenger: this is similar, often with some supplementary guidance.

Rail freight this is mostly commercial, with the use of CBA restricted to mode shift from road in England.

Bus/tram: this is similar to roads. It is not always done in Sweden or for smaller German schemes.

Aviation varies: the Netherlands and England use appraisal for strategic decisions, regulation and planning applications. Some use is made of appraisal in the US and New South Wales.

Sea/water: appraisal is mandatory in Germany, the Netherlands, the US, where there is central funding, and for some schemes in New South Wales.

Cycle/walk: mandatory in England, varies for others.

Current spending: only a few examples are provided, such as rail franchising and bus subsidy in England.

Appraisal and its influence on decisions

Qualitative and quantitative impacts

There has been increased use on monetised values since HEATCO, so the role of unquantifiable factors is diminishing.

England uses initial BCR to categorise projects into four categories of very high (>4), high (4-2), medium (2-1.5) and low (1.5-1) value for money (VfM). Ministers are advised and consulted on whether non-monetised impacts would, in their view, change category/rank and make their judgement (only projects with a BCR of over 2 are approved).

There is less evidence from other countries: BCR >1 is a hurdle for the Netherlands, Sweden and Germany.

Germany and the US rely more than other countries on BCR for ranking national schemes, because the environmental appraisal sets mitigation measures.

Strategic factors - England

England uses the Treasury business model for economic, strategic, management, commercial and financial cases.

The economic case is CBA and welfare, while the strategic case is based on policy objectives such as jobs, gross value added (GVA) and carbon, with some overlap to the economic case.

The UK Government has transferred some responsibility for local infrastructure investment to local authorities, with more weight on the local strategic case and less on national CBA.

There is guidance and evidence for strategic objectives but it is much less prescriptive than WebTAG, with only 8 pages. Estimates of jobs or GVA have usually been based on either a Land Use Transport Interaction (LUTI) model plus economic inputs, or models of agglomeration and employment densities, the Urban Dynamic Model (UDM, developed by the consultancy Steer Davies Gleave) or surveys to inform changes in costs and trade flows. There is no English regional spatial economic model. CBA takes a national standpoint, but this is not relevant for local schemes. The HS2 strategic case provides a good example of the challenges that analysts and policy-makers face in drawing up a strategic case which is sufficiently different from the economic case to add value to the overall business case.

Strategic factors - other countries

The US, Sweden and New Zealand identify various strategic factors for some schemes. The Netherlands has used spatial regional economic models to identify GVA and jobs impacts by region for some major schemes, but no longer maintains the RAEM model which has been used in the past to assess the likely impacts of a major scheme on the Dutch economy. The US Transport Investment Generating Economic Recovery

(TIGER) programme provided federal funding priority for projects which improve economic efficiency and productivity and reduce the cost of exporting. US states use a variety of models of the local economy and some prioritise on that basis.

Countries with a federal structure often have two sets of guidance. In Sweden and the Netherlands, the largest schemes are less likely to be ranked on BCRs alone.

Some conclusions from ICTAP

The principles of economic appraisal are widely accepted but they face challenges (at least in England) from time savings sceptics, urban land use planners and the real economy lobby.

Both monetisation and the impacts that are included in the CBA have been extended since HEATCO in all countries reviewed: there is convergence of methods and values.

While several countries estimate some “real economy” impacts, there is no consensus on how to do this.

The structure of government (federalised or centralised) affects the use of appraisal and its influence on decisions.

Some of the values used in WebTAG need updating: DfT has recently let a study to do this. Some other countries make use of more recent research findings.

Did we meet the client’s requirements?

The investigation showed that:

- England remains among the leaders in the use of CBA
- WebTAG provides a model of appraisal and modelling documentation, which is often benchmarked by others
- No country explains how the CBA metric influences the decision-making process: DfT process is rarely bettered in providing more information

The authors proposed an international forum and information exchange for officials and academics, to form part of the HEART conference in Leeds in September 2014.

Sintropher - additional findings

The study covered schemes in Germany, Netherlands, Flanders, England and France. It focused on local schemes, funded in Germany by the allocation of central funds to the Länder and in France in part by Versement Transport. A BCR greater than one was a requirement for schemes in Flanders and Netherlands, where BCRs have some influence on priorities, and in most cases for the German Länder.

France: appraisal of local schemes - vive la différence!

France has high quality appraisal guidance written by academics such as M. Boiteaux and E. Quinet. There is a law requiring the use of this guidance for all schemes. It is used by decision-makers in the case of national schemes, but for major local schemes the CBA is largely ignored, and the Préfet can always veto the scheme.

In the case of local schemes the mayor:

- Acts as the champion for the proposal
- Outlines a vision: transport, land use, public realm, regeneration
- Lobbies the communes, land owners, developers, businesses and residents to get support and to cooperate on move from vision to scheme design
- Lobbies national politicians for the state contribution
- Delivers the project

There are pros and cons of the French approach.

The pros are local buy-in such as for the "l'excellence ferroviaire de Valenciennes" scheme, the integration of land use and transport change: a package, not a transport scheme, and a high quality public realm.

The cons are that there is no evidence that the chosen option was better than others, and there is no concept of value for money. It can also be "unfair": it might be that the mayor of Dunkerque had a better scheme. There can be a lack of transparency in decision making process.

Discussion

Andrew Evans (Imperial College) said that many European countries are in line. Is this because they chose countries which were the best examples of those that had adopted CBA? Tom said that this was probably the case. They were looking at CBA methods and had not examined decision-making in countries which did not use CBA. He added that CBA might be taken to be a good approach to decision-making in countries such as the UK because we generally don't trust politicians. They also looked at Malaga, where a tram scheme was so unsuccessful that it closed after a year, and the cars were exported to Sydney.

David Starkie (Case Associates) noted an article in the Journal of Economic Transport and Policy which examined international comparisons in values of time. There was also a paper on how changes in assumptions change results. He noted that the report did not examine Norway, which has fewer budgetary constraints and may adopt schemes with a BCR of less than 1.

Chris Castles asked if Tom had drilled down to rationalising between different approaches. Tom replied not, but the report gives references to the sources for the values.

John Smith wondered whether a value had been arrived at for working time. Also how does CBA deal with optimisation bias? Tom replied that most countries use the GB cost savings approach. The DfT has just awarded a project to provide new estimates for working and non-working time values. He has no impression of any incentives to move away from the approach or of any challenges coming. On the question of uncertainty, Germany uses scenarios similar to the business case for HS2, which considered as one of the risks different scenarios for the year in which demand growth was capped.

Stephen Plowden (Independent consultant) asked if there was a bias in favour of capital rather than revenue expenditure owing to the low discount rates used: interest rates might increase in the future. Tom said that most countries have a national transport plan to deal with congestion and with more and less prosperous regions. Schemes are developed based on this, often with engineering input. Policy issues are important:

the UK has ruled out road pricing. The question of discount rates is for the Treasury. Discount rates have gone down because investment is seen as an engine for economic growth.

Jonathan Fisher asked how the BCR compares with other countries. Tom said that there was no comprehensive list available for schemes in England. Other countries were not asked. He also asked what proportion of funding in France was local: Tom estimated this as around 50%.

David Metz (University College London) said that one consequence of investment is a change in land use and this affects value. Do countries address land values? Tom said that there are examples like the Hong Kong MTR, which was given the right to build over new stations. Often schemes were in areas such as Valenciennes with low land values, so there will not be much gain, and even where there was it was hard to capture. However there were cases such as Battersea where it will work. David Starkie said that the approach was also used in Japan in a similar manner to Metropolitan Railway's development of Metroland in the early 1900s.

David also said that DfT was slow to keep WebTAG values up to date and to adopt new methodologies. He wondered where reliability was incorporated within WebTAG. Tom said that in addition to the standard BCR there was a supplementary BCR which includes such factors that are less certain, such as reliability. The Department is slow because it does not want to upset the policy side of the organisation by making changes to the BCR that could make schemes that are being worked on fall below two. Analysts have to make a difficult choice between leaving values unchanged and updating them, with the risk of alienating the policy and engineering teams. Tom suggested that there should be an automatic change every 2-3 years.

Chris Foster asked if any nations publish analysis before the final approval. Also, does anyone include optimisation bias on the benefits side? Tom replied that he was not aware of any countries that published benefits during the development of a scheme. Dick Dunmore said that Sweden does and that they do even estimate and report the BCR of higher rail access charges. Tom said that the second point was covered in last month's talk, which showed as an example the HS2 strategic case based

on assessment of uncertainty and a scenario based treatment of risk. Are generalisations emerging? There are difficulties in forecasting land use changes.

Vidi Mohan (Mott McDonald) noted that a lot had been said about BCR, but what about other metrics such as IRR? Tom replied that Sweden uses it and that NPV is used in other countries.

Dick Dunmore (Steer Davies Gleave) said that land use was a different issue where the state still owned most of the land, such as Australia or Hong Kong. Would any account be taken of the benefit of increases in land value to the Government? Tom said that he was not aware of this.

Mike Walsh wanted to know where schemes came from in the first place. Were there any examples where a political push was scuppered by BCR? Tom replied that this happens in the UK. He was also aware of an example in France, where the mayor proposing the scheme was of a different party to that in Central Government.

Andrew Evans said that a major factor was the reduction over time of savings from the reduction of casualties. He wasn't sure if this has become less significant, as safety standards have increased. We haven't changed values for 20 years. Should we use the same values for road and rail? There were higher non-injury costs with rail. Tom replied that they didn't specifically investigate this.

Tim Elliott concluded the session by saying that it might be interesting to look at Poland.

Report by Peter Gordon

Reviews

The views expressed are those of the reviewers and should not be attributed to the Transport Economists' Group

SPIRIT - A Strategic Plan for an Integrated Regular-Interval Timetable: draft proposals for the East Coast Main Line

Jonathan Tyler, Passenger Transport Networks (PTN) June 2014

<http://www.passengertransportnetworks.co.uk/SPIRIT--ECML.pdf>

Jonathan Tyler is a long-time advocate of a Swiss-style regular interval timetable and as part of the debate has written a report on the letting of the East Coast franchise. He states that the Department for Transport under-regards the importance of timetabling when it comes to franchising, and that the fragmentation of the network has resulted in poorer connections, with many train operating companies only interested in their own point-to-point traffic. He comments on the aspiration of Alliance Rail to run an hourly single-stop service from London to Edinburgh. It could be argued that Alliance is looking to capture long distance travel from air and that all that matters is connections at either end of the route, whereas most of the traffic that rail can capture will either transfer from road or indeed be generated by a more attractive offer.

He goes on to talk about the public interest, and contrasts the approach of operators from a number of countries. Virgin, for instance, treats rail travel as a commodity to be marketed like any other in a market of fragmented territories and lines, while at the other end of the scale Switzerland is a subsidised utility in a connected network. It is notable that most European operators are closer to the Swiss approach, which can be at odds with the approach of the EU Commission. The author makes a very good point, albeit as a footnote, that no publicity from the industry displays something that is often done in road atlases: a matrix of journey times and frequencies between a

selection of centres to illustrate that, despite all its weaknesses, Britain already has the making of a convenient quality network.

Finding freight paths is always difficult, with Network Rail seeking to flex the timetable to provide "occasional" paths. The Swiss avoid this problem by providing hourly freight paths, although this requires freight trains to run at a uniform speed. Network Rail is amenable to "skip-stop" operation, with various trains stopping at a different pattern of intermediate station stops. This does not allow for a regular pattern of interchanges or often even travel between intermediate stations.

This report is well-written and well-argued, and covers a number of important issues. It does, however, assume a certain amount of technical knowledge, and it might have been useful to have a glossary explaining terminology for the novice, and a brief appendix on generalised journey time, which includes factors such as access and waiting time. Time spent waiting for trains is given a higher waiting, and sometimes an interchange penalty is added, reflecting concern about missing a connection and the problem of changing platforms, particularly when laden with luggage or children.

The report touches briefly on the need to develop infrastructure, proposing improvements with Dunbar quoted as an example, and the need to use parallel routes to provide freight paths, but it could have been useful to have expanded on this and at a future stage to undertake a study of what additional infrastructure would be necessary to facilitate the kind of regular interval timetable that is proposed.

It is pointed out that the current rail network is very London-centric, and often very little thought is given to journeys that do not start or end at the capital. Very little economic modelling has been done on this. While outside the scope of the report, from the transport economist's viewpoint it would be useful to illustrate the relative size of the travel markets that a regular interval timetable would target, the level of traffic that could be generated or diverted from road, and the economic consequences of this. This would however be a far larger exercise. Is anyone looking for an idea for a PhD?

The report is highly recommended, and is an excellent read for anyone wishing to gain a wider perspective on how the rail network can be developed.

Review by Peter Gordon

TEG Committee 2014-2015

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The Transport Economists' Group, formed in 1973, provides a forum for people involved in transport economics to meet regularly and discuss matters of mutual interest. Membership is open to economists working in transport and others whose work is connected with transport economics.

The aim of the Group is to improve the quality of transport management, planning and decision-making by promoting lectures, discussions and publications related to the economics of transport and of the environment within which the industry functions.

Meetings, held at Arup's Central London HQ at 13 Fitzroy Street from September to June (except December), consist of short papers presented by speakers, drawn from both within the Group's membership and elsewhere, followed by discussion.

The Group's Journal, "The Transport Economist", is published three times a year reporting on meetings and other activities of the Group. It reviews recent publications of interest and contains papers or short articles from members. The Editor welcomes contributions for inclusion in the journal, and can be contacted at petersgordon@blueyonder.co.uk.

The current membership of over 150 covers a wide range of transport modes and types of organisation. Members are drawn from transport operators, consultants, universities, local and central government and manufacturing industry. All members are provided with a full membership list, updated annually, which serves as a useful source of contacts within the profession. Applications from people in all sectors are welcome.

Applications for membership should be made on a form which can be downloaded from the Group's website at www.transecongroup.org.

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Details of meetings are provided on our website at

<http://www.transecongroup.org/meetings.htm>

