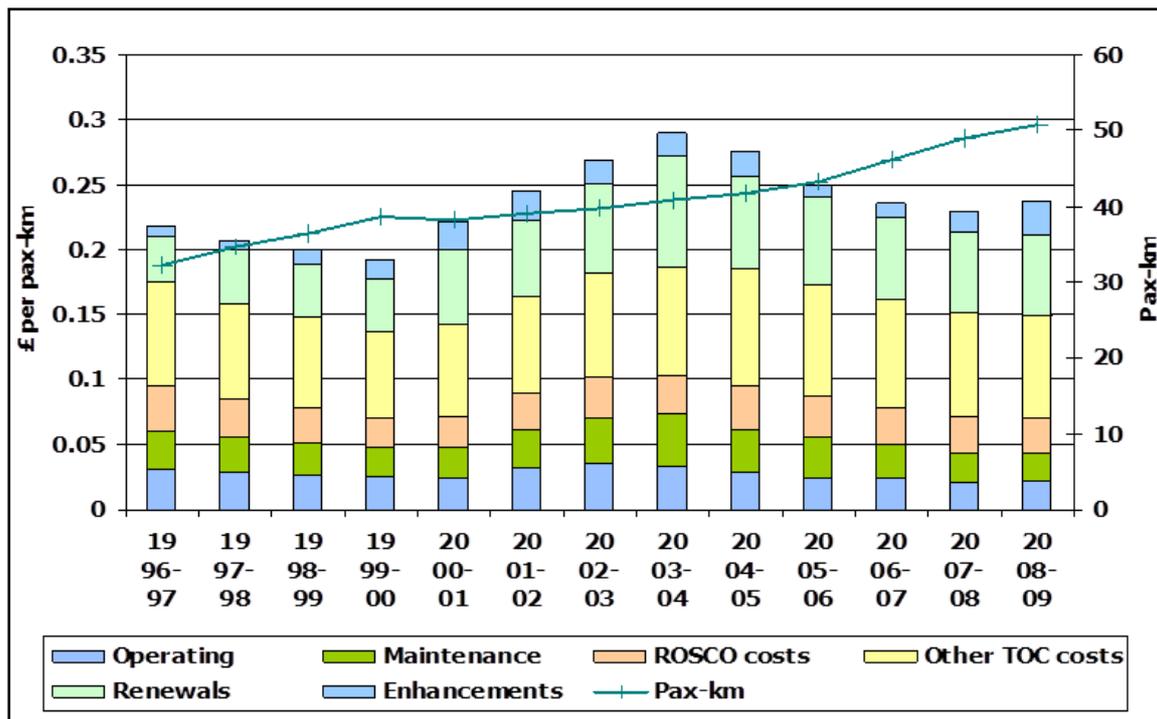


The Transport Economist

The Journal of the Transport Economists' Group



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The Nottingham Workplace Parking Levy

Jason Gooding, Senior Project Manager, Nottingham City Council

Arup

23 June 2010

INTRODUCTION: CONGESTION CHARGING SCHEMES

Jason began with a brief explanation of congestion charging schemes. Road user charging (RUC) schemes impose charges in respect of the use, or keeping, of motor vehicles on roads. All motorists are chargeable, subject to exemptions, and are liable for payment. RUC schemes generally involve a small charge payable daily by all users, and therefore result in a large number of transactions, requiring large scale enforcement activity. RUC schemes can be very strong demand management tools and raise much revenue, but require significant up-front investment and have high operating costs.

A workplace parking levy (WPL) scheme, on the other hand, imposes charges in respect of the provision of working parking places at premises. Charges are only liable for commuter parking and employers generally pay the charges. WPLs are generally large annual charges but result in a small number of transactions and require only low levels of enforcement. They have some demand management effect, but this tends to be much weaker than RUC schemes. More modest levels of revenue are delivered from WPL schemes, although these are significant for local transport schemes. The upfront costs of WPL schemes are low, as they require new administration systems rather than physical infrastructure.

The Transport Act 2000 provided the legal basis for local authorities to introduce congestion charging schemes by making a local order. Consultation and public inquiry are desirable but not mandatory. Under the Act, congestion charging schemes must be directly or indirectly facilitating the achievement of local transport policies, so the policies and objectives to be funded by WPL revenues must be derived from the Local Transport Plan. The Act ensures that the net proceeds of these schemes are ring-fenced for the delivery of local transport policies, rather than being applied only as a local tax.

There are a number of examples of congestion charging schemes, including Durham and London, although the Durham scheme is very small. Ambitious plans in Edinburgh and Manchester were rejected after local referenda. Perth in Western Australia has a workplace parking levy in its central business district (CBD) similar to Nottingham's plans, with few discounts or exemptions, and funds are ring-fenced for the city's free Central Area Transit (CAT) bus services.

On the future prospects for congestion charging schemes, Jason considered that the legal powers were likely to remain in place, with no change proposed in the Coalition Agreement or the Queen's Speech. The emerging "localism" agenda suggests that there is a need for local funding options, particularly at a time when local authorities will be finding it increasingly difficult to fund new local transport schemes.

NOTTINGHAM

Nottingham is one of the Government's eight core cities and one of six science cities. The population of the city is 270,000, with 750,000 in the travel to work area, and the Greater Nottingham economy is worth more than £12 billion per annum. It is a retail-based economy, and hence it is important to get shoppers and visitors into the city efficiently.

Public transport is always high on the local agenda, with a strong drive to improve buses and trams and not just the road network. 45% of households in Nottingham do not have access to a car, compared with the English average of 27%. DfT has classified Nottingham as a centre of excellence for local transport delivery, and successes include an 8% increase in public transport use in five years, 10 million passengers a year using the tram, and three million passengers using the Link bus network which serves the hospitals, educational sites, industrial estates and East Midlands Airport. Effective public transport has been critical in helping to contain traffic growth over the last five years.

However, transport needs to improve further, to grow the economy and to provide for the demands of housing, employment and education. According to the East Midlands Development Agency, congestion is costing Nottingham £160 million a year, 50% of which falls on businesses. Traffic is forecast to have increased by 15% by 2021. The solutions for Nottingham's future are seen as provision of attractive alternatives to the car, and continuing to develop high quality public transport, including the high quality and reliable tram network.

NOTTINGHAM'S WPL SCHEME

The development of Nottingham's WPL scheme has taken ten years so far and is expected to be implemented in two years' time. Interest was first expressed in 2000, and advance funding for scheme development was received from Government. The intention was to improve public transport first before WPL was introduced, and without this there was no political will to introduce the scheme any earlier. In 2006 the Government gave approval for Phase Two of the Nottingham Express Transit (NET) tram network, and work resumed on WPL.

A public consultation, involving an Examination in Public (EiP) with an independent inspector, was carried out in 2007. While not mandatory, this was seen to be an opportunity to demonstrate the business case in public. Recommendations from the EiP were incorporated into the order for the scheme, which was submitted in 2008 and confirmed in 2009 by the Secretary of State with some changes to the original scheme, including a two year delay to allow time for businesses to adjust to the scheme following the recession.

The rationale behind the scheme is that the most serious congestion problems in many towns and cities are associated with peak period commuting. The principal aim of the levy is to incentivise employers who currently provide free or cheap car parking to discourage car commuting and encourage the use of alternative modes of transport, including car sharing. This is achieved by imposing a levy on employers related to the number of liable workplace parking places that they provide.

A "liable workplace parking place" is defined as a parking place provided by an employer that is occupied by a motor vehicle used by an employee, a regular business visitor such as a consultant or contractor, a pupil or a student. The WPL is charged on the maximum number of liable workplace parking places, and will apply to all employers within the Nottingham City Council administrative area. It is left open to employers whether or not they recoup some or all of the charge from their employees, but the scheme offers support on travel planning and parking management, to encourage behaviour change.

Exemptions and discounts are not specified in the relevant legislation. Local authorities have the powers to make decisions in these areas, although the legislation does refer to the need to minimise the administrative burden on small businesses. The Nottingham scheme offers a 100% discount to small businesses with ten or fewer liable parking places, emergency services, NHS frontline services and

disabled spaces, although a licence is still needed for administrative purposes. Exemptions, for which no licence is needed, are provided for customer parking places, fleet vehicle places, loading/unloading and motorcycles.

It is intended that the charge will start on 1 April 2012 at £253 per parking place, rise gradually to £306 by 2015, and be subject to future increases linked to inflation. Revenues of £14 million per year are expected by 2015, and all funds will be ring-fenced for investment in policies and objectives contained within the Local Transport Plan. Funds cannot be used for anything not in the LTP.

Public transport improvements to be funded by the WPL include:

- NET Phase Two, extending the existing tram network and including a 2,500 space park-and-ride facility and integration with the railway station. The local authority is providing 25% of the funds from the WPL, with the remainder coming from central Government.
- The redevelopment of Nottingham railway station into a twenty-first century transport and business hub, which is a big business priority for the city.
- Maintaining and improving the city's Link bus service which serves some of the city's key employment sites, hospitals and universities.

The scheme is not just about charging employers but about helping to change behaviour, so a range of ongoing business support measures are available to employers and employees. These cover topics including travel planning and smarter choices, public transport and personal journey planning support, parking management and traffic management. So far, there are travel plans covering 50,000 employees in Nottingham.

Only 500 employers will incur a WPL charge, although 3,500 employers, accounting for 20% of parking places, will need to hold a licence for their liable parking places. The direct impact of the scheme on congestion is expected to be relatively modest, depending on what employers do in passing on charges and managing parking. The levy is not high enough to have a great impact in isolation but, with the complementary package funded by the resulting revenue stream, traffic growth is expected to be reduced from 15% to only 8%, with 2.5 million car journeys off the roads by 2015. Over the same period, public transport journeys are expected to rise by 20% and the demand for park-and-ride capacity by 45%. Without WPL funding, it is unlikely that Nottingham would be able to

afford its tram extension or the station enhancement scheme, or to maintain the current level of bus service provision.

For the business case, Nottingham had to examine and test alternatives to the WPL. Other funding options considered were core business rate retention, increasing council taxes, sale of assets, lottery funding, European grants, local developer contributions and road user charging. Overall, there was a lack of certainty over the alternatives. Some would be long and costly to implement, others had limits to the funding that could be achieved. However, if in the future a better funding option emerged, WPL could easily be adapted as it is primarily an administrative scheme and does not have the infrastructure requirements of, for example, road user charging.

The immediate timetable ahead is that from July 2011 employers can apply for a WPL licence and on 1 October 2011 the scheme will come into force and employers will be legally obliged to hold a licence, although at no charge. This period allows for compliance and enforcement to start before charges are introduced on 1 April 2012. So far Nottingham is the only local authority in England to introduce a WPL scheme, but there is now considerable interest from others who are watching its implementation.

DISCUSSION

John Bates (independent consultant) was surprised how low the charge was planned to be, at less than £1 per day. Given that the cost of public parking was much higher, why are the WPL charges so modest? Jason explained that the charge was set at a level that brings in a certain amount of funding for transport schemes, without generating a surplus. To make a direct impact on behaviour, the charge would have to be raised, but this would impose a high cost on employers and the additional funding is not required.

John Cartledge (London TravelWatch) asked whether the scheme was politically contentious or caused problems for businesses such as Boots. He also asked for explanation of the criteria on the number of parking places. Jason outlined that the discount for 10 spaces was applied to the total number of parking spaces within the local authority area, not the number per car park. He acknowledged that the scheme has been difficult for Boots and other employers, who don't agree that employers should pay. Before the Secretary of State's decision in 2009, local employers were reluctant to engage with the scheme and were actively

lobbying against it, but now they are working out how to deal with it. The largest employers will be paying £0.75-1 million per year in charges, but they are already receiving benefits, such as subsidies for bus services to large employment sites. Some employers may threaten to leave the area, but others will be attracted by the tram improvements.

David Spurling (Learning Through Cooperation) pointed out that Pfizer in Sandwich was trying to get rid of its parking facilities because there was better value to be had from the land. Is there any link in the Nottingham scheme to land use planning, such as improved land use, or multi-storey car parks? Jason highlighted that Nottingham Trent University has been reducing its parking provision steadily over the years, replacing student parking with student apartments and a small multi-storey car park instead. For most employers, parking is a hidden cost, sometimes providing a constraint on land availability.

David Simmonds (David Simmonds Consultancy) asked what percentage of parking spaces are open land, and therefore re-developable, and below ground? Also, what percentage of spaces are rented separately from office premises and could be surrendered? Jason was not able to provide specific numbers but pointed out that if a company contracted parking spaces from a provider such as NCP it would still be covered by the WPL. He anticipated a reduction in parking provision overall as land is turned over to better use, such as for customers, helping businesses to grow.

Tom Worsley (Department for Transport) asked about enforcement and whether there was a database of employers that could be used to identify whether they subdivided their parking spaces to gain exemption. Jason explained that several business databases and recent surveys had been used to build up an understanding of off-street parking space numbers. Providing data has been optional so far, there is sufficient for a baseline for modelling. Legislation refers to the “associated persons” concept, to avoid companies splitting their parking space numbers.

John Bates observed that 15 years ago WPL looked much inferior to road user charging. However, in his view, the introduction of RUC had been mismanaged and the cost of technology under-estimated, even in London. Technology is not yet sufficiently advanced to bring costs down. WPL looks very low cost and very likely to happen.

Report by Julie Mills

Low Emission Vehicles

Michael Hurwitz & Dennis Morgan

Arup

27 October 2010

INTRODUCTION

Michael Hurwitz began by explaining that he would cover policy aspects relating to Low Emission Vehicles (LEVs), including the strategic context. Dennis Morgan would concentrate on the economic modelling of uptake, user behaviour and the technology.

Public and press attention on reducing carbon emissions from vehicles tends to be concentrated on the more dramatic developments in pure electric vehicles. However, there will continue to be a range of vehicle technologies, and the internal combustion engine will be with us for many years to come. In the context of this presentation, the terms Low Emission Vehicles and Electric Vehicles are used to cover a whole range of technologies, including:

- Pure Electric Vehicles (EV), battery-driven and mains-charged
- Hybrid Electric Vehicles (HEV), such as the Toyota Prius, with a internal combustion engine capable of charging a battery
- Plug-In Hybrid Electric Vehicles (PHEV), similar to Hybrid Electric Vehicles but with the facility to charge the battery from a mains supply

Both HEV and PHEV avoid the range problems associated with pure electric vehicles.

ENERGY EFFICIENCY AND CARBON USAGE

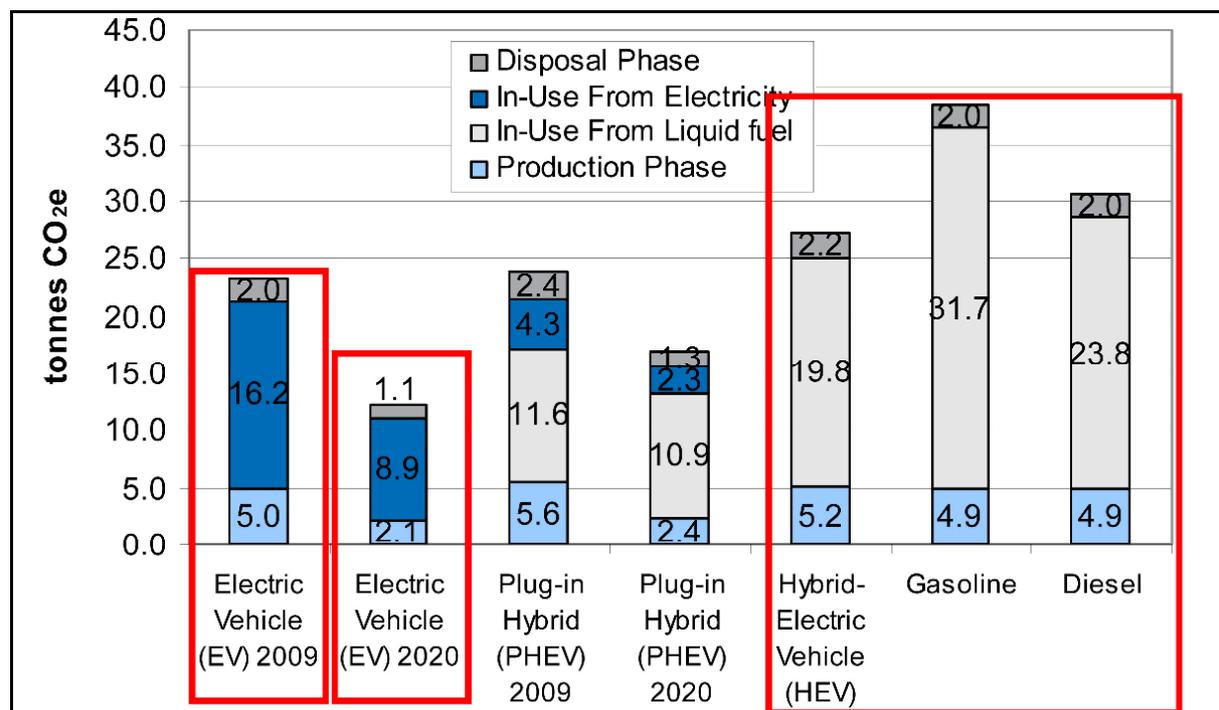
The various technologies have differing strengths and are suited to different purposes, but ultra-low emission vehicles are not a panacea either for overall carbon reduction or for mass transportation. There is no single technology fix, and public transport and alternatives to transport will also be needed. For EV and PHEV to be a completely effective means of carbon reduction there needs to be a “green grid” providing

electricity from non-carbon sources. In general, however, it is more efficient to use electricity from any source to power vehicles than to use fossil fuels directly, even allowing for generation and distribution losses.

Batteries will always be expensive, although prices are falling, and so the capital cost of any form of LEV will be higher than that of conventional vehicles, at least in the early market. However, at present the largest constraint on usage of electric vehicles is the limited manufacturing capability and availability of vehicle supply. In the short term the most cost-effective means of carbon reduction will be improvements to the energy efficiency of conventional vehicles. EU Regulations are already leading to the production of lighter vehicles with more efficient engines and to users purchasing smaller vehicles. If everyone changed overnight to driving the most energy efficient vehicles, carbon emissions would fall by some 30%.

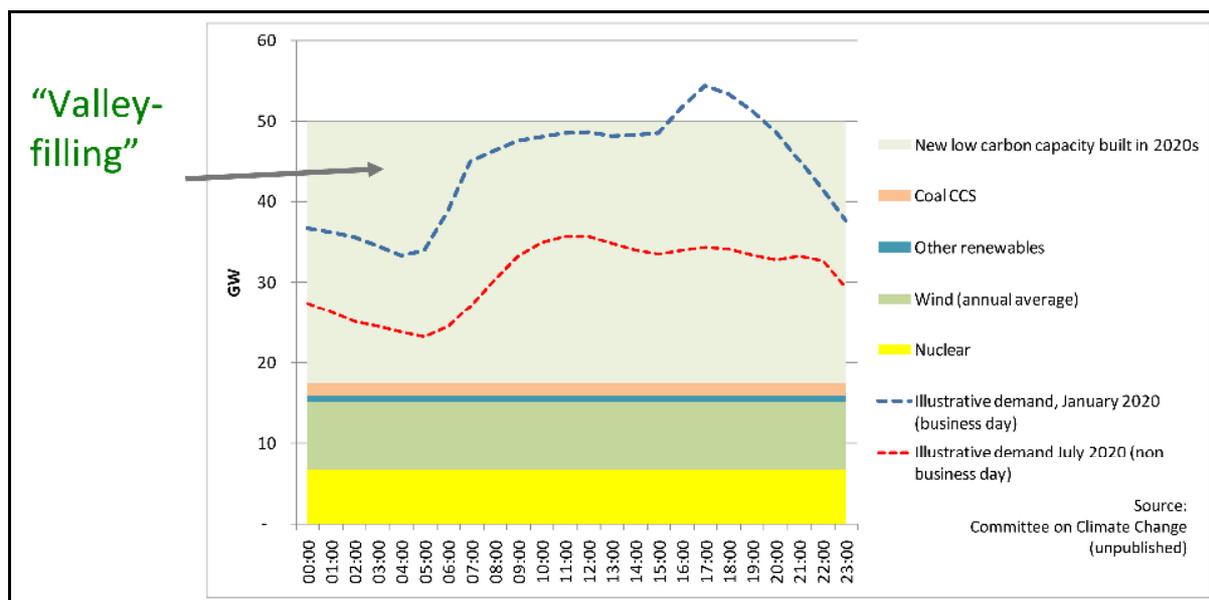
Figure 1 illustrates the life-cycle energy costs of various types of vehicle in terms of CO₂ equivalent.

Figure 1: life cycle energy costs and CO₂ equivalents



EV and PHEV provide an effective means of storing off-peak electricity, which makes investment in base-load low-carbon electricity generation more attractive and enables the “valley filling” shown in Figure 2.

Figure 2: “valley filling”



AIMS AND INCENTIVES

The aim of the Office for Low Emission Vehicles (OLEV) is to place the UK at the global forefront of ultra-low-carbon vehicle development, demonstration, manufacture and use. During this Parliament OLEV aims to create a flourishing early market for such vehicles, with a path to mass market. A budget of over £400 million to achieve these aims was confirmed in the October 2010 Comprehensive Spending Review. The focus in taking forward these aims will be on Incentives, Infrastructure and Industry, discussed in turn below.

Incentives

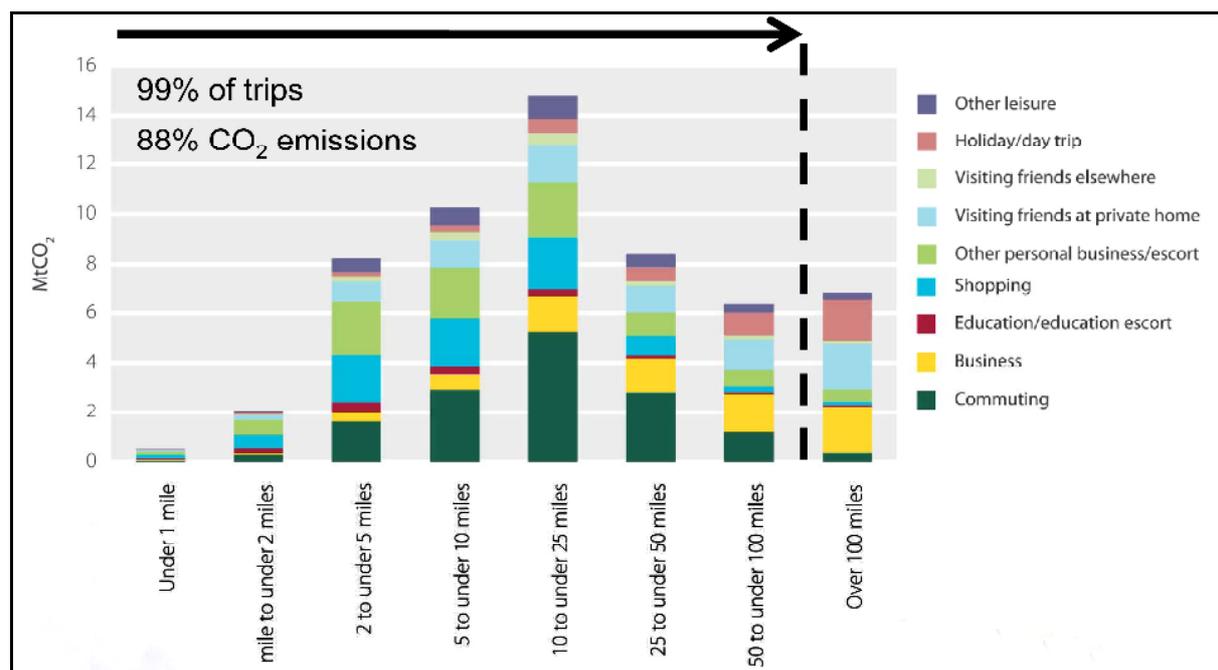
The expectation is that carefully chosen incentives will stimulate behaviour. From 2011 there will be a subsidy, based on tailpipe emissions, of up to £5,000 per vehicle. Potential markets amenable to such incentives might include those entering the third age with grown-up children (around 4.3 million people), technology early adopters in socioeconomic groups ABC1 (around 3.4 million people) and some fleet buyers (at least 50% of new car purchases are to fleets). It is inappropriate to create a market that is dependent on government intervention. Government needs both to provide just enough incentives to create a tipping point and get the market going and to have an exit strategy once the market takes off. The basic need is to stimulate volume production of batteries to get unit costs down, which can be seen as a market failure.

Infrastructure

Significant projects are proceeding to install charging facilities in three cities/regions, the North East, Milton Keynes and Greater London, as collaborative efforts involving the local community, local authorities and utility companies. The objective is to see how such infrastructure affects how people behave locally and how this affects the grid. Experience with installing charging infrastructure elsewhere has been interesting, with users of electric vehicles worrying significantly about the risk of running down the battery. In Tokyo, users were reluctant to undertake long journeys when there was only a single charging location, but were happy to drop to just 20% of battery capacity once a second was introduced.

The UK's population density and distribution are well-suited to electric vehicle use. The range of pure electric vehicles is adequate for most UK journeys, although this limitation can be avoided with PHEVs.

Figure 3: trip purposes and lengths



Industry

The Government is helping fund development of ultra-low emission vehicles, focusing on opportunities to develop UK-based supply chains.

MODELLING

The key questions is “How will Plugged-in Vehicles (PiV) affect transport forecasts?”

- What will be the penetration or uptake of PiV?
- How will technology develop range, cost and ease of use?
- What will be the fundamental energy efficiency of PiV be?
- What will be the effect on behaviour, how will they be used and re-charged, will miles driven change, and in what environments?

Modelling is currently constrained by the enormous range of uncertainties, all of which can, however, be influenced through policy choices. Inevitably, the models developed to date do not yet provide any definitive answers.

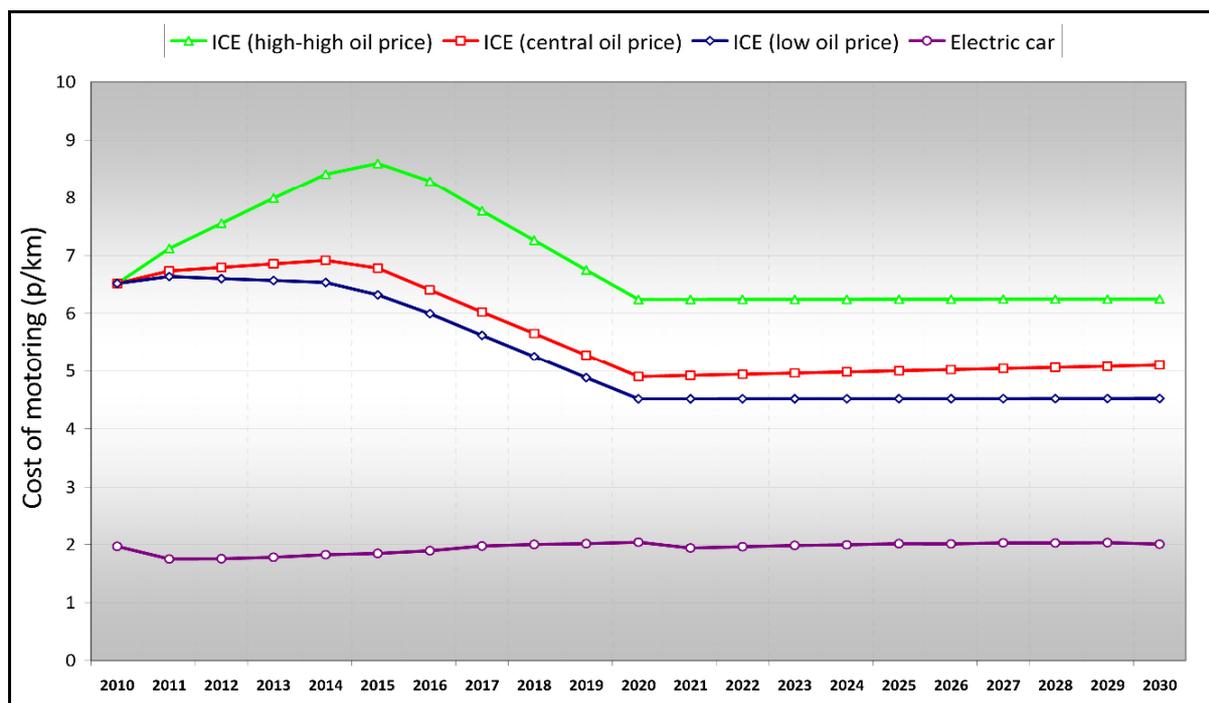
Penetration/uptake

The private car is a complex consumer good, bought for all sorts of reasons. A major issue in building models is how to value this “utility”. Key drivers of utility are:

- Availability or supply, a function of the production processes and costs, regulation, demand and selling price
- Total cost of ownership, a function of fuel prices, initial cost, taxation, energy efficiency, insurance, maintenance, and ancillary charges such as parking and congestion charges
- Attractiveness, a function of size, seating capacity, range, styling, and even colour choices

As with any modelling work, it is assumed that individuals trade off attributes between alternative vehicles so that the utility of the chosen vehicle is higher than that of any alternative. OLEV is currently developing a choice model to simulate such choices, but in the mean time the focus is on the total costs of vehicle ownership. Figure 4 shows the anticipated total cost of motoring, in pence per kilometre, for internal combustion engines (ICE) and electric cars. The relative fuel prices used in the model are around 2p/km for electric vehicles and around 7p/km for ICE vehicles.

Figure 4: projections of the cost of motoring



The chart assumes that, while fuel prices rise, the efficiency of ICE vehicles improves considerably. The balance between these two factors has a considerable effect on the shape of the curves.

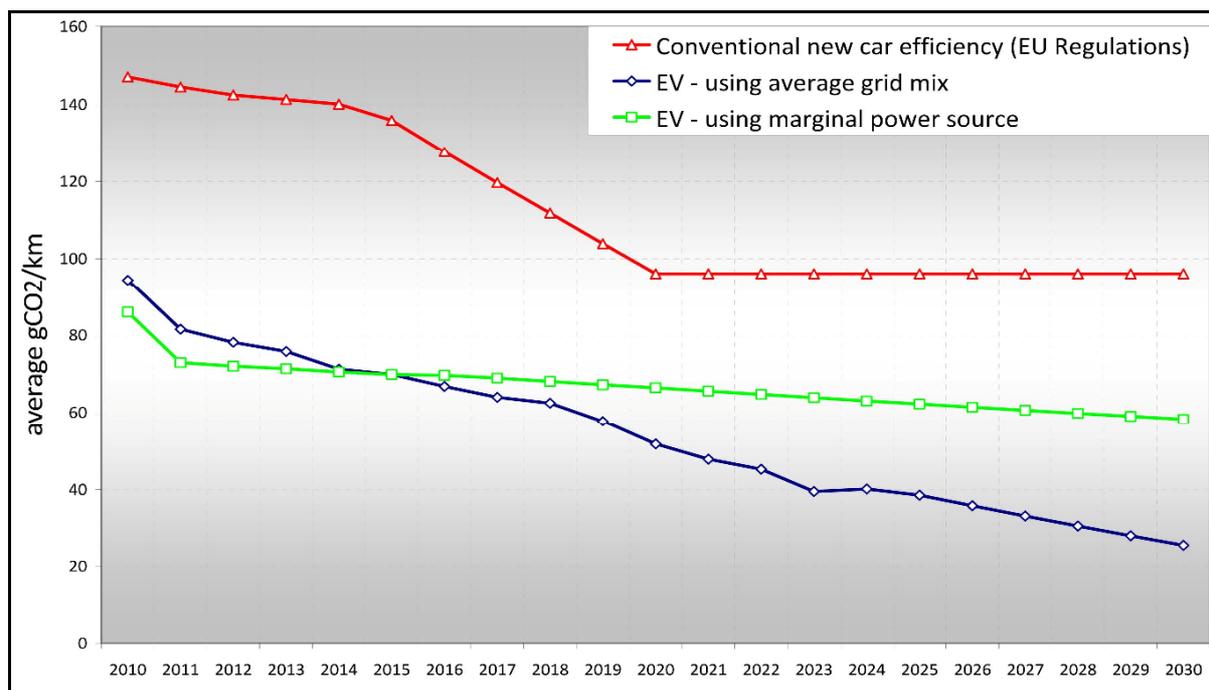
Much of the additional upfront cost of electric vehicles is the price of the battery, currently around £10-12,000 per vehicle. The prevailing view is that battery prices will fall as the market for electric vehicles develops. One suggestion is that battery prices may fall by 60% over 10 years, putting the extra cost for an electric vehicle around £3-4,000.

OLEV cannot yet model market penetration and uptake of PiV in detail, both because of the extent of this uncertainty and because the cost of PiV ownership will vary according to where people live, through effects such as the London Congestion Charge and varying electricity tariffs. One aim is to use models to enable subsidy to be set at a level at which additional upfront costs are balanced by the reduced operating costs over the typical period for which the vehicle is kept.

Technology

Figure 5 shows the anticipated changes in average grams of CO₂ per kilometre for conventional and electric vehicles. Depending on regulatory pressures, the average for conventional vehicles may continue to fall.

Figure 5: projections of CO₂ output per kilometre



Behaviour

Key issues and unknowns are whether electric vehicles will be used as second cars or as the primarily/only car, or engender different patterns of travel. The limited evidence available is that owners tend to use their electric vehicle as something between a first/only car and a second car, although this tends to be from a self-selecting group of early-adopters.

The pattern of use is fundamental to understanding the future profile of energy demand. As described above, night-time charging can use base load non-carbon electricity generation, while early evening charging could lead to an additional requirement for coal power stations.

NEXT STEPS

Next steps in modelling and policy formulation will include:

- Developing speed-emission curves for electric vehicles
- An ongoing review of the evidence on travel patterns and re-charging arrangements adopted in the three trial areas
- Choice-modelling of consumer preferences to inform forecasting
- Monitoring market trends in a fast-changing technology

DISCUSSION AND QUESTION

Nick Collings (University of Cambridge) noted that the modelling work required many assumptions, including future taxation policy on low emission vehicles and improvements in battery prices and lives. He thought that there would be an future environmental need for electric vehicles, but was concerned that the concept was being oversold at present. The speakers felt that the models incorporated cautious assumptions on battery prices and lives, with improvements in battery life assumed only for the next ten years. Incorporating battery management systems into vehicles will be important to improving the potential number of recharging cycles. On taxation, the speakers pointed out that government revenue from duties on fossil fuels will inevitably fall as conventional vehicles became more efficient. Environmental considerations are only one part of Government policy towards electric vehicles: there were important industrial imperatives, such as encouraging investment in R&D and production in the UK.

Stephen Plowden (Self-employed transport consultant) was interested in how overnight charging of electric vehicles helped spread demand for electricity. He wondered whether an equivalent approach using battery technology might have a place in the domestic environment. He also believed that the single largest contribution to reducing CO₂ emissions would be lowering the speed limit on motorways from 70mph to 60mph. Making cars lighter and less powerful would also help. The speakers explained that lowering speed limits was not part of their remit. Speed limit enforcement did not appear to be a particularly effective means of CO₂ reduction, but downsizing by motorists and production of lighter vehicles did produce useful benefits. The ideal with battery charging would be to have intelligent systems which only took mains power at the optimum times for least carbon emissions. As far as they knew, no one was looking at battery technology for major domestic purposes.

Peter Gordon (Editor, The Transport Economist) was concerned whether the additional mass of batteries might increase energy use, and at the environmental impact of the manufacture and disposal of large numbers of batteries. The speakers commented that in general the batteries' mass was compensated for by having a much smaller, or no, internal combustion engine engine. Researchers were currently studying the relative merits of reengineering expired batteries for continued automotive use or cascading them for other less-demanding purposes. The location of battery raw materials could be an issue for the future.

Simon Lister (Independent consultant) asked the speakers for their views on the idea of a hydrogen network for London. The speakers did not foresee purely hydrogen-powered vehicles as a significant way forward in the short term, although some manufacturers aim to produce cars with hydrogen fuel cells by 2015. A more attractive solution, suggested as an optimum in a recent report by Imperial College, might be to have a smaller battery, with the hydrogen fuel cell as a range extender. Some 80% of the drive chain is the same for electric and hydrogen powered vehicles.

Peter White (University of Westminster) asked whether, in view of the higher upfront cost, there was scope for leasing electric vehicles to individuals as an alternative to outright purchase. The speakers felt this could be a way forward: some manufacturers will be offering EVs on a lease basis and others propose selling “mileage packages”. Other models are emerging whereby customers who bought an electric car would gain membership of a car club and hence access to an alternative vehicle for long distance trips.

Keith Buchan (MTRU) felt that electric vehicles were an interesting development, but should not be regarded as the complete answer to reducing carbon emissions from transport. The speakers agreed. Electric vehicles would be an important part of the mix, but were not a substitute for energy-efficient public transport for mass transportation.

Dick Dunmore (Steer Davies Gleave) noted the research experience indicating people’s anxieties about exceeding the range of electric vehicles. Perhaps, as with many consumer products, a market would develop for post-purchase accessories which could mitigate range limitations. The speakers agreed that innovation in the automotive market had proved remarkable over the years. One interesting option would be to identify charging points on satellite navigation systems.

Claire Harman (Peter Brett Associates) wanted to know whether any lessons had been learnt from the experience with EU legislation on toxic emissions. The speakers suggested that the main lesson was that manufacturers were both over-cautious in what could be achieved in a given timescale to meet regulations and over-optimistic in how quickly their own products would come to market.

Nick Collings observed that electricity is needed to produce hydrogen: it is not a naturally available fuel. When used in fuel cells only some 25% of the original energy used to produce the hydrogen is recovered in motive power.

Gerard Whelan (MVA Consultancy) wanted to know the extent of European and global intergovernmental cooperation on electric vehicles. The speakers explained that, in general, there was considerable international interest and cooperation amongst governments in sharing their experiences. Major activity on research and development is centred in the USA and in China. Manufacturers tend to regard Europe as a lesser market or which the UK is only a part. Some economies had sunk resources into particular existing technologies, such as diesel engine manufacture in Germany, and as a result were moving more slowly than other producers such as Japan or France.

Time for further questions having run out, Gerard Whelan thanked the speakers for their extremely informative and stimulating presentation and closed the meeting.

Report by Gregory Marchant

The McNulty Rail Value for Money study

Tim Griffiths, Office of Rail Regulation and Rail Value for Money team

Arup

24 November 2010

STUDY REMIT

Tim began by explaining that the Rail Value for Money (RVfM) study currently in progress was jointly sponsored by the Department for Transport (DfT) and the Office of Rail Regulation (ORR). Chaired by Sir Roy McNulty, a former chairman of the CAA, and deputy chair Ian Dobbs, formerly of BR and Stagecoach, the remit was:

- To examine the overall cost structure of all elements of the railway sector and to identify options for improving value for money to passengers and the taxpayer while continuing to expand capacity as necessary and drive up passenger satisfaction
- In particular, to examine:
 - What legal, operational and cultural barriers stand in the way of efficiency improvements
 - The incentives across different parts of the rail industry to generate greater efficiency
 - The role of new technology, processes and working practices in fostering greater efficiency
 - Ways of generating more revenue, such as changes in fares structure, car parking, gating at stations, better utilisation of property
 - To make recommendations

The study was about to publish an interim report, which is now available at <http://www.dft.gov.uk/pgr/rail/strategyfinance/vfminterimreport/>.

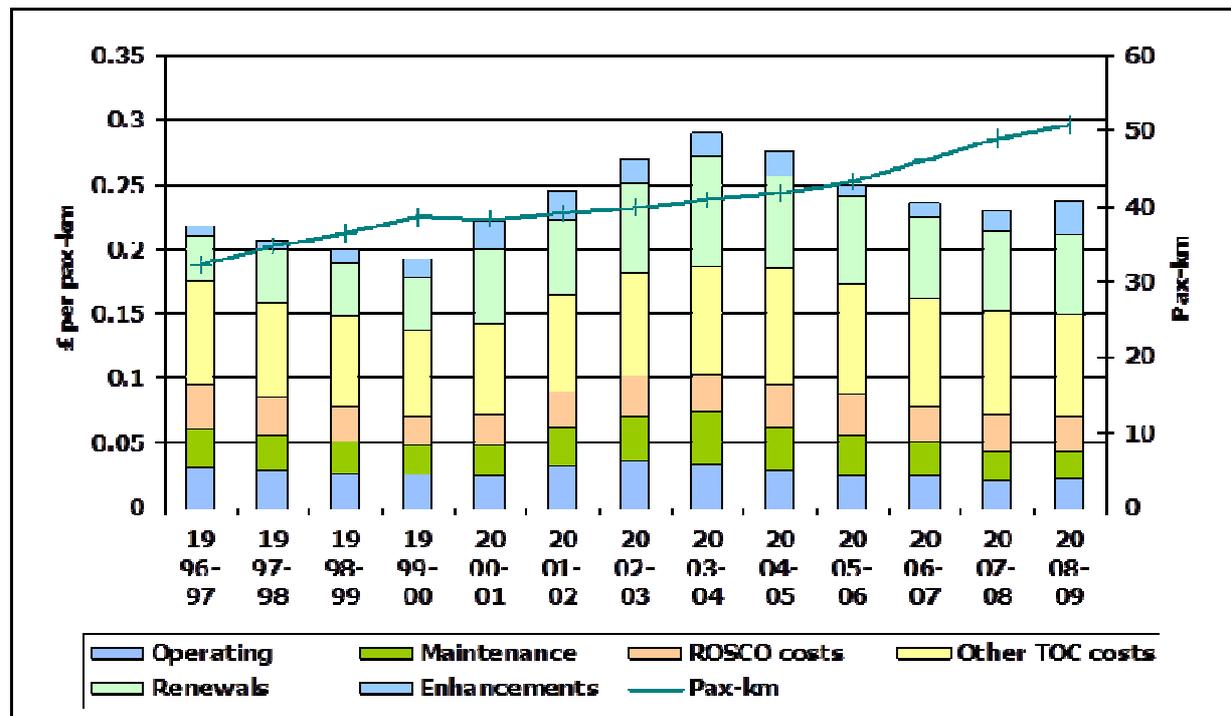
WHAT IS THE PROBLEM?

In many respects the rail industry of Great Britain has seen considerable success in recent years:

- 75% increase in passenger revenue and 59% increase in demand since 1996/7
- 23% increase in output, measured in train-kilometres
- Significant improvement in performance since the Hatfield disaster, with performance now exceeding “pre-Hatfield” levels
- An improving safety record

However these improvements have come at a big cost: there has been a significant increase in both government subsidy and in expenditure, with the latter partly driven by the need to increase capacity to cope with rising demand. While the cost increases can in part be explained by passenger and freight volume growth, the main concern is that, despite the increasing input and output volumes, there has been little change in unit costs, that is, no economies of scale. This is illustrated by Figure 1, which shows the unit cost changes in real terms over a period when passenger-kilometres rose by 59%.

Figure 1: rail industry unit costs over time



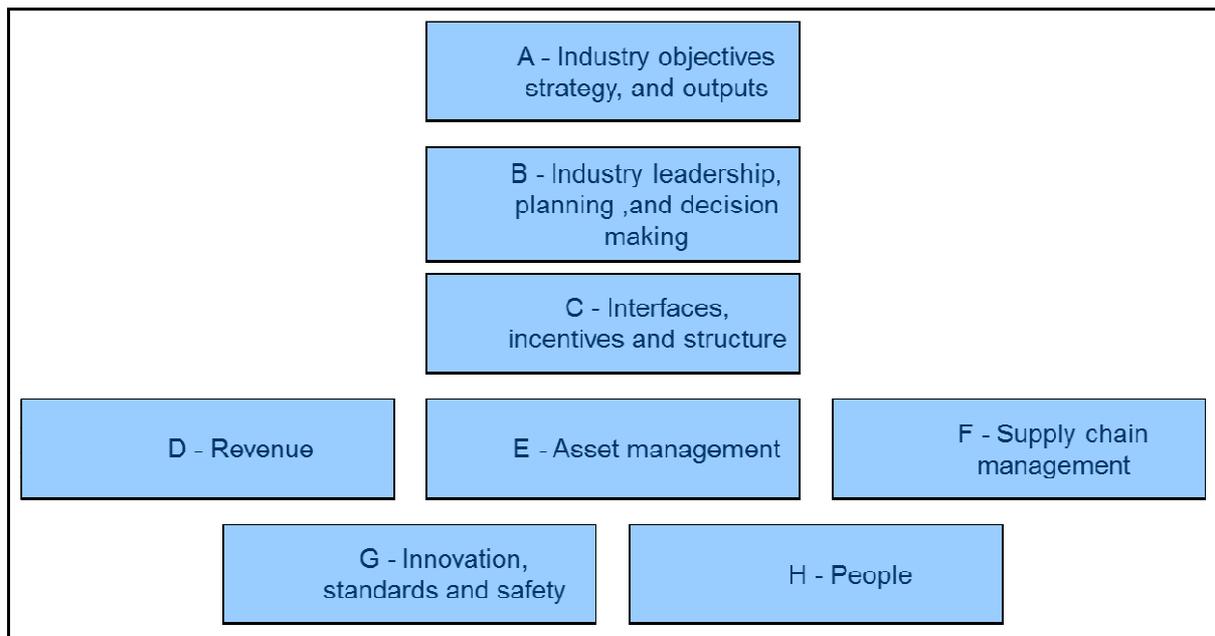
Source: RVfM Team

Benchmarking against other railways has also suggested that the British rail industry is up to 40% less efficient than top performing railways in Europe, with civil engineering costs as much as twice as high, and none of the significant cost savings which European countries have enjoyed following franchising or privatisation. While the next periodic review will offer some opportunities for cost reductions, the strict targets already set for Network Rail by ORR, and the speed with which reductions can be achieved through the Regulatory Asset Base (RAB) mechanism, mean that this will not be the whole answer.

WHAT IS THE RVfM STUDY DOING?

The RVfM study is organised into eight workstreams, summarised in Figure 2 below.

Figure 2: RVfM study workstreams



Workstreams A-C are effective strategic workstreams. Workstreams D-H are facilitative workstreams, gathering evidence in particular areas. For example E and F will examine the hypothesis that the rail industry is “off the pace” in these areas compared to other sectors, while G will address, among other things, the suggestion by commentators that risk-aversion is driving up cost. The work to date had concentrated on evidence-gathering through consultancy studies and extensive dialogue, including industry and stakeholder workshops.

WHAT ISSUES HAVE BEEN IDENTIFIED?

Tim concentrated on the findings to date of workstreams B and C.

The main issues from workstream B, leadership, planning and decision making, were:

- Clarity over the role of government, which has taken on an increasing role in recent years and has not always been able to devolve accountability
- Lack of clear industry leadership
- Need for a whole system approach
- Weaknesses in planning: short-term focus and lack of flexibility
- Weaknesses in decision making
- Predominance of infrastructure solutions: industry structures tend to incentivise capital solutions rather than operational solutions
- Inappropriate rolling stock investment and use, through inappropriate allocation and limited liquidity in the market

For workstream C, incentives, interfaces and structures, the key findings to date were:

- Lack of a joined-up focus on costs and revenues: operators and Network Rail each concentrate on their own costs and revenue
- The industry is fragmented, and incentives are misaligned
- Lack of customer-driven relationships and partnership through the supply chain
- An unbalanced relationship between key industry parties
- Much of the risk remains with government, in particular through franchise cap-and-collar arrangements and Network Rail's status as a company limited by guarantee (CLG)
- The contractual regime requires agreement to change and lengthy consultation
- Mistrust between parties in the industry

WHAT MIGHT THE SOLUTIONS LOOK LIKE?

While the study was still very much in progress, the findings to date had started to suggest where solutions might be found, including:

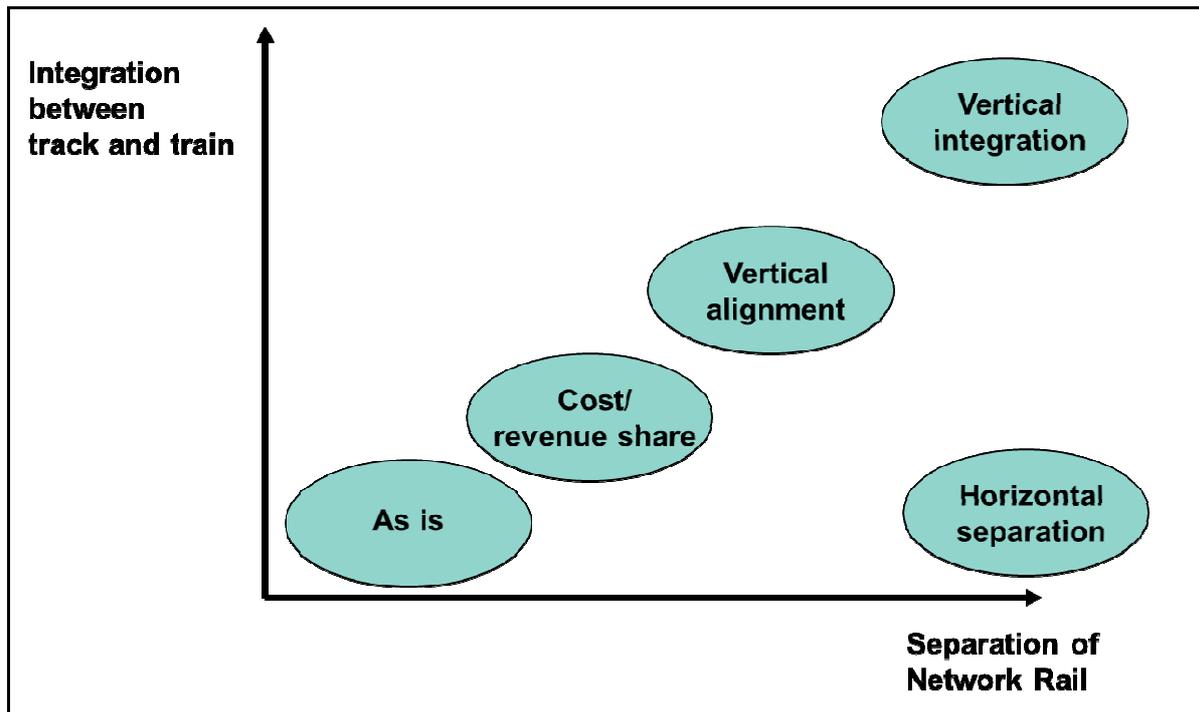
- Greater clarity and better alignment of objectives, particularly around costs
- Greater clarity of the roles of Government and industry
- Strong and aligned leadership from Government and the industry
- A much stronger focus by the industry on costs and cost reduction
- Stronger, aligned incentives
- Reform of franchising arrangements
- Improved planning and decision-making
- More cost-effective approach to standards and rail safety
- Major improvements in asset management, programme and project management, and supply chain management
- Improved management of human resources

A key theme was a move from organisations operating in “silos” to working in partnership, and the study’s current “direction of travel” was:

- Devolution/decentralisation within Network Rail, compatible with running a safe and effective single railway system
- Alignment/partnership between Network Rail and operators
- Safeguards for freight and open access operators
- “One size does not fit all”

Figure 3 below shows the broad structural options which were being considered at the time.

Figure 3: Structural Options Being Considered



Even at this early stage there were some clear potential indications for the rail industry:

- The opportunity to remove a lot of barriers
- A substantial degree of change is likely
- The key is getting the various players working together more effectively
 - Government / industry / regulators
 - Network Rail / passenger and freight operators
 - Procurers / suppliers
 - Industry / workforce
- Costs have to be reduced substantially (Plan A)

Plan B, the only alternative, would be less investment and a radically smaller network, and is not being considered as part of the RVfM study.

DISCUSSION

Stephen Bennett (retired) suggested that the cost problem was attributable to Network Rail. He noted that in the current Control Period Network Rail had dramatically underspent compared to its settlement, mainly due to a reduced volume of activity, and suggested that ORR might have provided too large a settlement and therefore be part of the problem.

Tim agreed that Network Rail was part, but not all, of the problem, noting that operator costs were also rising. He noted that regulatory issues were being considered by the study.

Professor Stephen Glaister (RAC Foundation) noted that little had been said on the fundamentals of input costs, and asked how much of the problem related to them. Work he had carried out suggested that there had been a surprising increase in wage costs after privatisation.

Tim noted that, as costs were either wages or materials, significant attention was being paid to all aspects of wage costs and their drivers by the study. The RVfM team had extended Professor Glaister's analysis which suggested that wage increases had been more tempered in recent years.

Stephen Burke (London Borough of Bexley) noted that a study by DfT seemed to suggest that there was no link between franchise length and performance. He asked how longer franchises would lead to reduced costs.

Tim said there were four ways in which this could happen:

- Owning groups might be expected to bid proportionately less for longer contracts
- By lengthening the investment "window", operators would be able to make investments with longer payback periods
- Most operators are not currently long-term players in the industry, which would be mitigated by longer franchises
- Staff will have more of an interest in longer franchises as they will have more consistent management

Stephen suggested that a more hands-off role from government and an increase in investment were contradictory: surely investment needed to be centrally prescribed?

Tim responded that in a “normal” service industry, investment is driven to a much larger extent by customers’ willingness to pay, but the link between outputs and fares in the rail industry is currently weak. While there is a residual value mechanism in franchise agreements, operators appear to be nervous about using it, so that longer franchises will allow them to make investments and see the payback through the farebox.

John Cartledge (London TravelWatch) noted that the British Rail era had seen regular periods of industrial unrest which had led to poor customer service and public perceptions. Given the improvement since privatisation, he suggested that staff might have been underpaid by BR and are now properly remunerated for a better service, and cautioned that cost cutting in this area might jeopardise the improvements which have been seen.

Tim reiterated that the main driver of service levels should be what customers are prepared to pay and equally, that if the government wants increased outputs, then it would need to pay. The focus of the study is increasing the efficiency with which existing outputs are delivered.

Julie Mills (TEG) asked if the speaker would comment on some of the other workstreams, in particular the one looking at fares.

Tim said that the study was considering both the regulation of season tickets and Off-Peak (formerly Saver) tickets, and in particular examining what regulation was seeking to achieve in each of these areas and whether the approach could be improved.

Neil Chesters (Frontier Economics) asked about the implementation plan for the study.

Tim that this was still work in progress but consideration was being given to whether the whole industry needed to own the issues and be accountable for delivering the solutions, and that one possibility was a cross-industry implementation group reporting directly to the Secretary of State.

Jeremy Drew (Independent) referred back to John Cartledge’s question, saying that while the point was probably correct for London and the South East, rail staff in other regions were comparatively well-off. At present there seemed to be a lack of regional flexibility.

Tim responded that regional devolution was being looked at as part of the study, noting in particular the poor fit between Network Rail’s organisation and some PTEs, and also the example of Germany where

significant cost savings had been achieved by devolving franchising to the individual Länder.

Peter Gordon (TEG) noted Network Rail's bias towards infrastructure solutions to capacity constraints, and asked what other solutions were available.

Tim said that more effective demand management was the main tool to be examined, something Robert Devereux highlighted in his evidence to the recent Public Accounts Committee inquiry (<http://www.publications.parliament.uk/pa/cm201011/cmselect/cmpubac/c/471/47102.htm>).

Dick Allard noted that there had been little mention of freight. Did this mean that it wasn't a problem, and even if this was so was there a need to look at the coordination between passenger and freight?

Tim noted that freight had been one of the success stories of privatisation with multiple companies competing for contracts, which had driven down costs. He confirmed that the study would be looking at freight-passenger interaction, and that the implications for freight were a key issue. He agreed with a supplementary point from the questioner that there were lessons to be learned from freight in the area of unit costs. Professor Glaister noted that freight was the one area where competition is effectively unfettered by regulation.

Gregory Marchant (TEG) noted that European railways often have a higher provision of infrastructure and capacity, giving them greater flexibility when carrying out maintenance, and asked whether this was something which had been looked at.

Tim said that the study had done some benchmarking work which suggested that was not true, at least not universally, and noted that capacity utilisation in Great Britain was much lower on the regional rail network than on the London suburban and intercity networks.

Richard Davies (Association of Train Operating Companies) made two comments in relation to productivity:

- In Germany and Denmark, incoming franchisees are allowed to choose which franchise staff they wish to take on and renegotiate their terms, rather than having to take the whole establishment under TUPE.

- The general view before privatisation was that because BR was so cash-rationed it actually became very productive, which wasn't the case in other sectors. He wondered whether, when more cash was made available to the privatised industry by the Labour government, it has not been spent as efficiently.

He asked whether one approach was for the government simply to set an overall cash limit for the industry to work within.

John Cartledge said that the message seemed to be that a less prescriptive approach to managing the industry was required. He noted that the current approach had generated some benefits, such as an increase in maintenance and enhancement spend, fares regulation and preservation of network benefits, and that there had been some losses, such as de-staffing of stations, and reduction in parking facilities and on-train catering. He asked what the benefit of greater freedom would be.

Tim responded that the government's role has expanded because of the level of risk it is currently shouldering. The aim was to preserve outputs but reduce costs. The study was considering whether it would be possible to move towards a more "normal" industry where what the government buys is incremental above what the market will pay for.

Report by William Wingate

Reviews

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

Mark Casson, *The World's First Railway System: Enterprise, Competition and Regulation on the Railway Network in Victorian Britain*, Oxford University Press, 2009

Professor Casson's thoroughly and comprehensively researched study may become well-known for its creation of a counterfactual railway network – the “might have been” network that ought to have been built and could have “saved” the construction of a third of the actual network – but it is valuable for much more than this; notably for its insight into the actual Victorian railway system. The work displays great breadth and depth of knowledge of Britain's railways and how they fitted into the Victorian economy. The extent to which the Victorian experience has lessons for the twenty-first century is perhaps greater than the author acknowledges. The similarities between the early Victorian period of transport entrepreneurship and competition and the present day shine through the text. The potential lessons to be learned are perhaps stronger for the bus industry, for example as the local bus market undergoes investigation by the Competition Commission, than for the franchised rail passenger sector, although parallels with “open access” rail passenger operations are close.

A great strength of this book is its analytical approach, which is accompanied by clear and succinct stratification and classification of issues. Throughout the work, Casson explains the why as well as the what, for example in identifying the facilitation of international trade as an underlying influence on many early railway schemes, a conclusion that would have been endorsed by the Cornish Quaker businessman and diarist Barclay Fox (*Barclay Fox's Journal 1832-1854*, edited by Professor R L Brett, Cornwall Editions, 2008), who campaigned to bring the railway to Falmouth, so as to secure its role as a packet port in the face of competition from ports closer to London.

Casson characterises the “railway mania” of the 1840s as a chapter of wasted opportunities, in which the government failed to arbitrate between competing local schemes that could have resulted in a more beneficial network of interconnected lines, but he plays down the commonly held notion that the various incompatible local proposals were

caused by the greed or dishonesty of promoters. In his treatment of joint lines, Casson identifies and discusses in relation to each individual line the different reasons for their construction, from the perspectives of each participating partner: invasions of other companies' territories (Midland & Great Northern, connecting the Midlands with East Anglia and breaking the monopoly of the Great Eastern), boundary markers (the Great Northern / Great Eastern through Lincolnshire), truces between invaders and defenders (Norfolk & Suffolk, unusual in being owned by a joint line (M&GN) and a territorial incumbent (GE)), ownership defragmentation (Cheltenham & Gloucester), feeder and various local lines such as urban goods and colliery links.

The chapters on regulation and business strategies and their effects place the Victorian railway industry in its economic, social and political context. There is a detailed review of the role of the short-lived Railway Committee of the Board of Trade, whose interventionist support for regulation and coordination offended the local sensitivities of MPs and led to its abolition. Tables 6.3-6.6, summarising the principles adopted by the Committee in making its judgements, provide much food for thought, for example regarding the limited extent to which competition might be sustainable and the benefits of joint stations (a compromise solution between Network Rail and train operator ownership that would be worth investigating for today's railway). In summarising Victorian railway companies' philosophies and strategies, the chapter on business strategy also provides many opportunities for comparing the nineteenth century situation with the twenty-first; the uncertain balance between railway operation as a business and a public service; nimbyism; and the poor economics of branch lines (a recurring theme in this book is that many dead-end branch lines should have been built as parts of through routes). Two ingredients are identified as having been crucial to the establishment of the railway network; limited-liability joint-stock companies, which enabled capital to be raised without exposing promoters to unlimited financial risks; and compulsory purchase, which reduced the ability of landowners unreasonably to disrupt or raise the cost of proposals.

The structure of the counterfactual network is built up from first principles, according to which links are provided between all towns over a certain size; between towns with complementary activities; between each town and its nearest provincial centre and London; and between neighbouring towns of similar size. All towns and villages with populations of 3,000 or more in 1831, or over 1,500 if they were on the actual network at its maximum extent in 1914, are included in the

network. The avoidance of wasteful duplication lies at the heart of the counterfactual network. The network was constructed using an iterative approach, based on performance comparisons (according to distance and time metrics) between the actual and counterfactual networks. Starting with a very sparse counterfactual network, more lines were added until its performance equalled that of the actual network. This point was reached with a counterfactual network of 13,000 miles, approximately two-thirds that of the 20,000 mile actual network, including 2,000 miles of lines that were not built “but should have been”. This is the justification for Casson’s hypothesis of the counterfactual network. Benefits identified including savings in capital expenditure and in the time taken to complete a national rail network. Somewhat belatedly, Casson only informs his readers towards the end of the book that the Board of Trade's advisory role in 1844-5 provided the rationale for the counterfactual network.

Contradictions to the case for limiting competition are also identified, for example that fares and freight rates were higher at locations with a single supplier than where two or more competed for business, a contributory factor in the late nineteenth century decision to construct the Barry Railway to compete with the Taff Vale in South Wales. Whether the counterfactual network would have had the capacity to carry all the traffic accommodated on the theoretically less efficient and often duplicate actual network is not explored in detail. It would be instructive to examine traffic statistics for a sample of competitive routes in the busiest corridors, to establish whether or not they were being used to their full capacity, or whether the same quantities of traffic might have been accommodated on a smaller network. Casson's observation would have to be taken into account, that the counterfactual network would have been subject to fewer delays and capacity pinch-points, because it would have had fewer intersections than were found on the actual network, many of them existing principally to afford connections between the lines of competing companies.

A key component of the theory of the counterfactual network is the role of hubs in enabling the country to be united by a universal railway system without the proliferation of competing, duplicate and therefore wasteful lines. Two categories of location on the rail network are distinguished according to their primary purpose: those that generate traffic; and hubs that are mainly interchange points. The number of hubs is influenced by the size and complexity of the network.

The counterfactual network is based on four categories of link (trunk, primary, secondary and local, each with different speed and capacity

characteristics) and nine heuristic principles of network design, starting from the Steiner principle of minimising inter-hub distances by ensuring that where three lines meet at a non traffic-generating hub they do so at angles of 120°. As the counterfactual network grows, both in length and in complexity, further principles come into force, including traffic-weighting (minimise the lengths of busiest links), triangle, bypass, loop, and so on. Similar principles can be seen at work in the evolution of the motorway network over the past fifty years and, in 2010, underlie the identification of high speed rail link options north of Birmingham.

This book is refreshingly easy to read, without being unduly populist in its style. Straightforward historical presentation and critical analysis of the railways' role in the Victorian economy are successfully juxtaposed with the use of geometric theory to construct an optimal network. The hypothesis that the rail network was too large and inefficiently planned is clearly presented, and the counterfactual alternative rigorously planned. Technical and tabular appendices ensure that the narrative is not unduly burdened with details of legislation, individual routes or theoretical models although, as a result, such material occupies a third of the volume. The copious but perhaps over-ambitious bibliography cites more sources than are explicitly referred to in the text, but it is divided into so many subject, geographical and company-related sub-sections, which are arranged non-alphabetically, that it is difficult to navigate around. For example, finding "Paine 1961" is a challenge if you do not know it is placed in (and where to find) the "Engineers" section.

"The World's First Railway System" is a thoughtful and thought-provoking addition to railway and business history, whose perspective on the development of the Victorian transport industry has many lessons for the twenty-first century; possibly more than the author acknowledges. The material Casson presents whets the appetite for further investigative research into the strengths and weaknesses of a competitive railway industry. The story needs to be taken further, to include a similar evaluation of the impact of the "big four" companies between 1923 and 1947, arguably enormous, despite occupying a period of only 25 years, as well as of the British Railways and subsequent privatisation eras.

Reviewed by Martin Higginson, Associate, Institute of Railway Studies & Transport History, York University / National Railway Museum.

Video – Diamonds in the Sky (BBC 1979, Presenter Julian Pettifer, Producer John Purdle, Executive Producer Richard Cawson)

I received a DVD of the 1979 BBC series “Diamonds in the Sky presented by Julian Pettifer” in my stocking this Christmas. The series has seven fifty-minute episodes, looking at the social impact of aviation. The following is a review of the second episode, which looked behind the scenes at United Airlines in the Chicago area in August 1978. Other episodes look at the development of flying the North Atlantic, the effect of tourism and British Airways’ managers in the Middle East attempting to secure rights for Concorde.

The U.S. Airline Deregulation Act had just been passed. Route restructuring was yet to happen and one of the scenes showed a very lightly-loaded 737 on a regulated route to Ely Nevada which lost \$2 million a year: the programme predated the growth of commuter carriers. However, price regulation had just been relaxed and as a result prices were down and load factors up, and United Airlines was having trouble coping with the increased demand.

If instead of going back 32½ years you go back 65, double the time, World War II had just ended and civil aviation was restarting in the UK. By far the biggest changes seem to have happened in the first half of this period, both in terms of hardware, with the move from Constellations (or converted Lancaster bombers if flying BOAC) to 747s, compared to 747s to newer 747s, and socially. The move from passengers travelling in their Sunday best to wearing jeans had happened, at least in the USA.

Of course some things never change: weather was more than capable of bringing Chicago O’Hare to a halt. The airline’s Chairman Richard Ferris was seen moaning about excess regulation, having to put stickers on car batteries warning against drinking the contents. Deregulation has advanced, but so have ambulance chasing lawyers! Julian Pettifer asked if airlines would still provide free services such as escorts for unaccompanied minors in the future (legacy airlines now charge) or for disabled passengers (yes they must).

What has really changed in the last three decades is information technology. It was vital in 1978, and United’s Apollo computer was the largest in civilian use at the time, but the screens looked primitive by today’s standards. A check of load factors showed them to be around 60% in the late 1970s against 85% for some airlines today. The programme spent some time in the reservation centre: the internet was

some way off. Hands up who would have predicted online booking thirty years ago!

The programme referred to how flying was no longer for the elite and was losing its glamour, and how service standards were dropping. These trends have continued: “frills” such as meals have disappeared from many flights. Few would link the words Ryanair and glamour.

It is interesting to look into a crystal ball and ask if such changes will continue. Air travel accounted for about 0.9% of U.S. GDP for a number of years up until 9/11 when this fell to 0.75%. Airlines have been able to reduce ticket prices thanks to lower costs, with areas such as distribution costs slashed and staff costs reduced, combined with higher load factors and more efficient networks (have a look at a 1978 timetable). It is hard to see how much further these costs can be reduced while at the same time taxation is being increased and it is forecast that oil prices will rise. Demand may only rise in line with GDP. We shall see.

A most interesting series available on the web at <http://classicaviationtv.webs.com/apps/webstore/products/show/1967898>

There was a book written to accompany the series by the series historical advisor, Kenneth Hudson and Julian Pettifer, also called *Diamonds in the Sky* (BBC Books, ISBN 0563177497)

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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 are held every month from September to June (except December) at Arup's Central London HQ at 13 Fitzroy Street. The meetings 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 journal@transecongroup.org.

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 obtainable from the Membership Secretary at membership@transecongroup.org.

Alternatively, an application form can be downloaded from the Group's website: www.transecongroup.org.

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Details of meetings are provided on our website at

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

