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The Transport Economists' Group

The Role and Financing of the British Transport Police

Supt. Tony Thompson and John Bentley, Director of Finance & Administration, British Transport Police

A presentation to the Transport Economists' Group
University of Westminster
8 December 1999

Peter White opened the meeting by explaining that Supt. Thompson would deal with the role of the British Transport Police as it is today and discuss some of the particular problems currently faced on a day-to-day basis. John Bentley would talk about the financing of this police force and how it was currently managed and administered.

Role of the British Transport Police

The British Transport Police had a long history as a private police force prior to privatisation of the railways. It had powers of arrest on railway property and was responsible for the prevention and detection of crime on that property. No doubt the policing of large national transport systems, with their special problems of crime prevention and detection, inevitably led to the early development of railway police forces which were merged into the British Transport Police at railway nationalisation in 1948. Equally inevitably much of its work involved co-operation with the civilian police forces as appropriate. Also, it needs be remembered that at nationalisation the old railway companies, the GWR, LM&SR, L&NER and SR operated other transport and associated activities e.g. docks, ferry services, road services, hotels, and that the railway police were inevitably involved with these as well as with rail services. Privatisation of the main-line railways and separate privatisation of these associated activities has necessarily led to changes in the scope of the activities of the British Transport Police, its management and funding. In the current 'national' organisation and administration of transport the British Transport Police now only serve the main-line railways and London Underground, plus a few others such as Heathrow Express, Midland Metro and Croydon Tramlink. Other transport organisations are policed by the local 'civilian' force.

The British Transport Police are most conspicuous of course when a major incident occurs on railway property, such as a train accident or public disturbance such as rioting by football crowds. Major incidents of this kind

nearly always involve co-operation with the local police force, which inevitably means both co-ordination 'on the ground' when the event takes place and contingency planning in advance as to how incidents of widely different character are to be tackled. The division of main-line railway operations between a couple of dozen passenger train operators, two freight companies and Railtrack, each with their own responsibilities in the day-to-day working of the railway industry, has added complexity to the problems of sorting out the 'whys and wherefores' inevitable in the aftermath of a major incident. Moreover, with the prospect of detailed investigation and enquiry into the cause of accidents ever present there is almost always a conflict between the short-term needs of rescuing the victims and restoring services and the longer-term requirements of an enquiry.

But, as with all police forces, most activity is with routine surveillance - prevention rather than cure. Major railway stations have their own police office, which is accessible to the public. Hence major stations will have a Transport Police presence, observable from time-to-time on the station concourse and platforms, particularly when large crowds are expected because of some major sporting event. Particular trains serving such events may be joined by police en route. Obviously, there must be co-operation and exchange of information between the Transport Police administration and the train operating company(s) running the train(s) and/or leasing the station if such surveillance is to be both appropriate in its scale and effectiveness. 'Train operating companies' include, in addition to the 25 TOC's of the old BR, the two freight companies (EWS and Freightliner), Heathrow Express and Eurostar (the latter involving co-ordination with French and Belgian police).

Trespass and vandalism is a recurrent problem on today's railways - particularly, of course, because of its implications for safety both to railway travellers and others. The Force has a five point strategy in this area of policing - prevention, detection, deterrence, education and community involvement. The latter two points of the strategy are publicised and reinforced by personnel visits to schools and mobile safety presentations in estates and other problem areas.

The Force works to targets to improve its performance, as do many other parts of the railway industry. These are set out as a number of objectives for improvement in given areas, together with means to achieve these objectives. Significant success in reducing crime and in detection rates has materialised in recent years. Since 1990 crime on railways in England and Wales has gone down by 25%, in Scotland by 29% and on London Underground by 23%.

The overall supervision of the British Transport Police is by the Police Committee. The membership of this committee is representative of the various

parts of the industry served by the Force (one from London Underground, one from Railtrack, two from the Association of Train Operating Companies - ATOC); in addition there are three independent members and a representative from the Central Rail Users Consultative Committee (CRUCC). The chairman is James Jerram, Vice Chairman, British Railways Board.

The 'field' organisation of the Force is on a geographical basis and consists of seven areas covering the whole of Great Britain, plus the London Underground Area which deals with most of the underground network and thus necessarily overlaps, in a geographical sense, the London North and South Areas. The Force Headquarters is in Tavistock Place, London. There are 90 police stations throughout the country. Thirty-three of these stations have officers posted to them and provide 24 hour service; a further 37 stations have officers posted to them but do not provide a 24 hours service; the remaining stations do not have officers posted to them.

Funding of the British Transport Police

The funding of the British Transport Police was and still is on the principle that 'the industry pays'. The problem is how the total costs of the Force are to be divided between the 25 Train Operating Companies (TOC), Railtrack, Open Access operators on the main-line railways and London Underground. No one will be surprised to learn that there is a requirement by the Rail Regulator that operators and Railtrack each have a contractual document with British Transport Police - the Police Services Agreement (PSA).

London Underground pays for the costs incurred by the London Underground Area and a share of HQ costs. Before 1 April 1999 the remainder of the costs were divided between:

(1) Open access operators (freight and Eurostar);

(2) Line of Route

(3) 'Independent' stations (the twelve large stations managed by Railtrack);

(4) Other (e.g. leased stations).

(2) and (3) were paid for by Railtrack, (4) by the TOC's. After 1 April 1999 the division of cost between open access operators, TOC's and Railtrack was amended to reflect the results of 'activity analysis', in accordance with the Police Services Agreement. Inevitably, some operators have been faced with increased charges while others have enjoyed reductions. Equally inevitably some of the former group have appealed to the Secretary of State.

The British Transport Police Budget 1999/2000 amounted to £113.7m, which is

less than 2% of the costs of the industry (railways and London Underground) enjoying its services. This total is distributed as follows:

Staff	80.4%
Premises	6.6%
Communications/computers	4.7%
Transport costs	1.2%
Supplies and services	4.5%
Depreciation	2.3%
Interest	0.3%

There are around 2,100 police officers and around 500 ‘support staff’ currently on the strength. These figures have not substantially changed since privatisation.

Discussion

Peter White opened the discussion, which followed the formal presentation by asking how the total level of resources and costs were determined. John Bentley explained that it was the responsibility of the Police Committee to decide overall manning levels and a budget. It was particularly helpful, in the context of industry-wide funding that there should be industry representatives on the Committee. The Committee has recently been debating how to respond to rising expectations from the travelling public, especially matters to do with personal security, and growth in the volume of business (some 25% since privatisation). Tony Thompson pointed out that one of the trends of recent years, during the period of growth in demand, had been that constables were spending more time at the large stations.

Don Box asked about co-operation between the British Transport Police (BTP) and train operators over the provision of security such as video cameras, lighting, etc. for the added safety of vulnerable groups of travellers. Tony Thompson observed that there had been a lot of investment in closed circuit television (CCTV), but not all of it had been wisely used. The BTP were in a good position to advise on best use of equipment, although it was possible that they were not consulted as often as he would like. To date, sixteen stations have achieved ‘Secure Station’ accreditation.

The meeting went on to discuss the economic justification for investment in security equipment. John Bentley considered that there was a better case for an improvement in the quality of service than a reduction in the unit cost of

operation. Peter White's suggestion of the benefit of reducing claims for personal injury was thought worthy of consideration, but was not likely to be of major importance. Don Box's suggestion of including broader social benefits was thought to have merit and John Bentley was able to inform the meeting that such criteria were included in the model developed to justify appropriate resources for London Underground services.

Stephen Bennett noted that regulators were developing standards, particularly measures of output, for rail and utilities to meet, as a feature of economic regulation in the UK. John Bentley replied that it would be very difficult to apply this sort of approach to the BTP as the ultimate test was the perception of the travelling public rather than any one quantifiable output.

Derek Done picked on the point about perception by asking if the BTP had conducted any surveys of public opinion. Tony Thompson said that there had been a number of surveys covering specific areas of activity such as car park security, but not on the broader issue of network tranquillity. John Bentley pointed out that the Shadow Strategic Rail Authority was working on a standard national survey, which might have something to say about security.

In winding-up the meeting the chairman thanked Superintendent Tony Thompson and John Bentley for a very interesting and informative presentation and for their participation in the discussion, and those present expressed their appreciation in the usual way.

Personal note: John Bentley has been auditor for the Group for nineteen years. He is retiring from the BTP at the end of this year, is moving to the West Country and it will then be impractical for him to continue auditing our accounts. As Treasurer of the Group I must thank him for the way he has carried out the audit over so many years and, in particular, for the advice he has given from time-to-time on improvements to the lucidity of the accounts and on finer points of accounting practice.

Don Box (report on the discussion by Stephen Bennett)

Bus Issues and the Transport Bill

Peter White, Transport Studies Group, University of Westminster

Talk given to the Transport Economists' Group
University of Westminster
23 February 2000

Setting the Scene

Peter White began by setting the scene by describing changes in local bus services since the mid-1980s. Table 1 shows the main changes that have taken place in Great Britain. It shows that bus kilometres increased while the cost of providing them per kilometre fell (-47%) so that total costs declined by a third. Whilst passenger trips and receipts fell over the period, net receipts per passenger trip increased by 27%. Total income from all sources, made up of passenger receipts, concessionary fare reimbursement and support payments, declined by 21% between 1985/86 and 1998/99.

Thus, while passenger numbers have fallen and bus kilometres have increased, the profitability of providing the services has grown by £421 million.

Table 1: Income and expenditure for local bus services, 1985/86 and 1998/99

	1985/86	1998/99	Absolute change	% change
Local bus km (millions)	2,077	2,643	+566	+27.3
Passenger trips (millions)	5,641	4,248	-1,393	-24.7
Cost/bus km (pence)	173	91	-82	-47.4
Total cost (£m)	3,593	2,405	-1,188	-33.1
Bus passenger receipts (£m)	2,286	2,192	-117	-4.3
Receipts/passenger trip (p)	40.5	51.6	+11.1	+27.4
Concessionary fare reimbursement (£m)	464	441	-23	-4.9
Support payments (£m)	831	180	-651	-78.3
Total income (£m)	3,581	2,813	-768	-21.4
Net surplus (£m)	-12	+409	+421	-
Surplus as % of income	-0.3%	+14.5%		

Notes to Table 1:

All financial data shown at 1998/99 prices.

All operations, including London

"Receipts/passenger trip" is the total passenger receipts less concessionary fare compensation divided by passenger trips, i.e. a measure of cost paid by passengers personally.

Derived from *A Bulletin of Public Transport Statistics Great Britain 1999*. DETR, November 1999, Annex B tables 2, 6, 19, 21 and 27.

In 1985/86 the whole support payment (then for networks as a whole) is included as operator income. In 1998/99 it is two-thirds of the sum shown in the DETR bulletin (an estimate based on earlier research), the balance being used by local authorities and PTEs to cover costs previously incurred by operators (e.g. some pensions), also costs of tendering, passenger information, etc.

Trends in Local Bus Services

The trends in local bus passenger trips, bus kilometres operated, real fares and the cost per bus-kilometre has shown marked differences throughout the country (see table 2). Passenger trips have declined everywhere except London, which saw an increase of 11% between 1985/86 to 1998/99. The decline has been most marked in English Metropolitan Areas outside London (-42%), followed by Scotland (-38%). The trends in passenger trips are also shown graphically in figure 1.

Table 2: Trends in local bus services, 1985/86 to 1998/99 **% change**

	Passenger trips	Bus kilometres operated	Real Fares index	Real operating cost per bus-km
English Metropolitan Areas	-42	+19	+64	-54
English Shires	-22	+32	+18	-41
Wales	-29	+24	n/a	-44
Scotland	-38	+26	+18	-48
Average for deregulated areas	-34	+27	+29	-46*
London	+11	+31	+40	-47
Average for Great Britain	-25	+27	+31	-47
Northern Ireland**	-14	n/a	n/a	n/a

* 1985/86 to 1996/97 inclusive.

** 1985/86 to 1997/98 inclusive

Source: *A Bulletin of Public Transport Statistics Great Britain 1999.* DETR, November 1999, Annex B tables 9, 10, 12 and 27

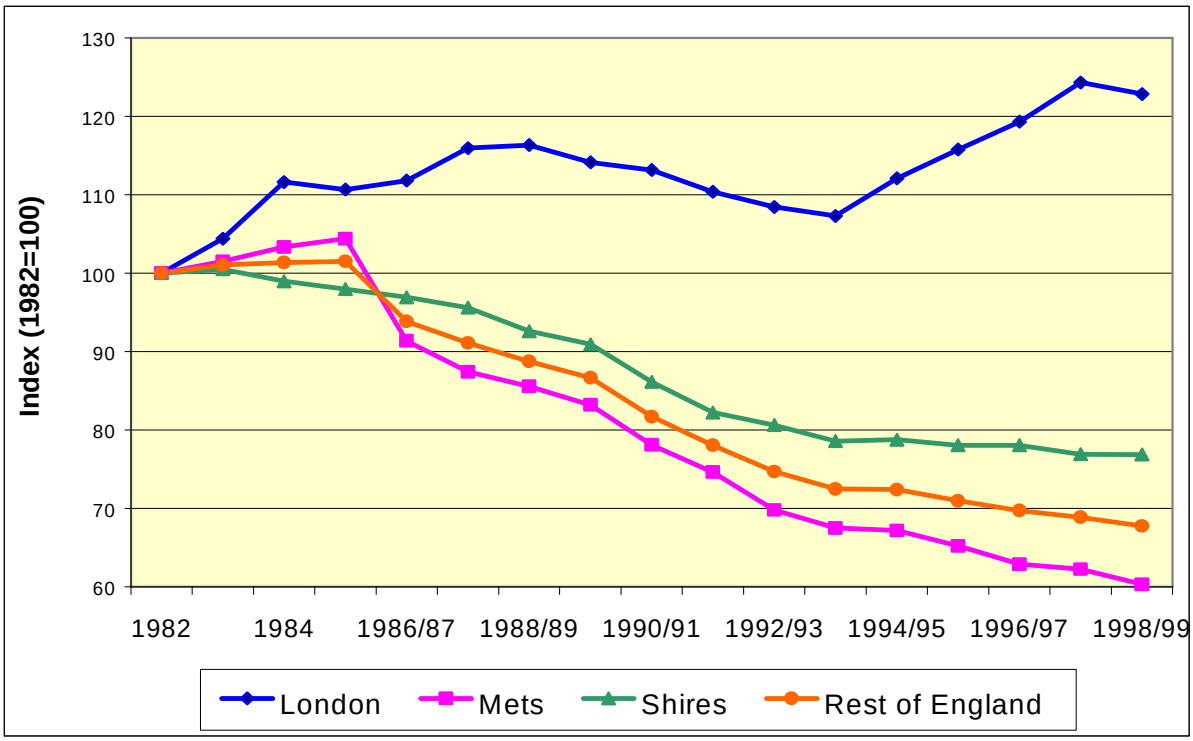

Figure 1: Passenger journeys on local bus services, 1982 to 1998/99

Bus-kilometres have increased everywhere, most notably in the English Shires (+32%) and London (+31%). The lowest increase was in the English Metropolitan Areas (+19%).

The reason for these differences could be partly explained by changes in real fares. For example, the Metropolitan areas had the largest decline in bus patronage (-42%) and the greatest increase in real fares (+64%). However, that does not explain the 40% increase (second largest) in London bus fares, which was accompanied by an 11% increase in bus patronage. However, despite a 40% increase (second largest) in London bus fares (on the DETR index), this was accompanied by an 11% increase in bus patronage.

Table 3 below shows the percentage change in bus boardings by type of household and personal driving status. It shows that in most cases there was a decline in bus boardings. Interestingly, bus patronage by non-drivers in car owning households declined across all areas. Bus patronage by people in non-car owning households also declined the least. However, it again shows that the decline was greatest in the English Metropolitan Areas.

Table 3: Bus boardings per person per year, 1985/86 to 1992/94				% change
	London	**Metropolitan Areas**	**Rest***	**All GB**
Persons in car-owning households				
Main driver	-10	-41	-10	-18
Other driver	+18	-29	+5	-3
Non-driver	-17	-20	-14	-14
Average	-11	-29	-18	-19
All Persons in non-car owning households	0	-13	-1	-4
All persons	-8	-28	-17	-18
All trips (operator figures)	-3	-35	-24	-23

* English shires, Wales and Scotland

Derived from National Travel Survey

Energy efficiency of local buses

Nationally, average fuel consumption is approximately 3.0 km per litre and the average loading per bus is about 9.6 passengers. This gives about 26 passenger kilometres per litre. Whilst fuel consumption is very similar between London and the rest of the country, the differences in passenger loading (about 12.5 and 8 respectively) mean that passenger kilometres per litre vary between about 40 in London and 24 elsewhere.

Compare this with new cars where the average fuel consumption is 12.5 km/litre and the average load is 1.5 people, there are only 19 car occupant kilometres per litre. Thus, buses are better than cars (on national averages) by about 30%, but there is likely to be an increase in car fuel efficiency and a risk of further reductions in bus load factors.

Summary of recent trends

The bus trip rate in non-car owning households is stable, except for the Metropolitan Areas. However, among car owning households it has declined. The core market is declining generally, particularly in Wales and Scotland.

Profitability has improved, largely due to cost reductions and, to a lesser extent, real fare increases. There has been no growth in the volume of passengers (except London) and, therefore, it is questionable whether profitability can be sustained.

The growth in bus-kilometres and fall in passengers has led to poor average load factors. This reduces the relative advantage in use of road space and fuel, although it is still more efficient than the car. There is scope for extra

passengers within existing capacity, which would raise productivity and profitability.

The aggregate margin in 1998/99 was 14.5% (table 1). The components of the £421 million net change in profitability for the whole industry were:

Reduced operating costs	£1,189 m
Offset by:	
- Lower passenger revenue	£117 m
- Reduced support payments	£651 m

Calculations using the same method for areas outside London (the deregulated area) show the following growth in profit margin:

1988/89	1.3%
1991/92	2.6%
1992/93	3.5%
1993/94	7.7%
1994/95	9.8%
1995/96	9.3%
1997/98	15.5%
1998/99	16.1%

Apparent Contradictions

Overall, there has been a decline outside London, but there has also been substantial growth in specific cases, which appears contradictory at first sight. This can be explained by differences in scale as, for example, an extra 400,000 passenger trips per annum due to Edinburgh Greenways, but with Scottish bus use down by 6% per annum between 1996/97 and 1998/99 (1998/99 was equal to 413 million trips). Compared to this Greenways growth was under 0.1% of annual total, or about 2% on the corridors affected.

Likewise, where whole systems have grown as in Oxford or Brighton this has been obscured within the published regional figures.

In assessing individual route upgrades, there is the issue of diversion from other bus services (e.g. Birmingham route 33) in measuring net growth. The question is "How far is it possible to extrapolate from "success" cases to the industry as a whole (e.g. London to English Metropolitan Areas, Oxford or Brighton to other free-standing towns)?" There are specific local factors as, for example, urban structure, car restraint, degree of competition from other centres, etc.

Transferable factors would seem to be management style, vehicle type, ticketing, priority measures and busways, and passenger information.

Government's Proposals

The 1998 White Paper introduced policies for improving bus services and patronage. This was followed by the daughter paper *"From Workhorse to Thoroughbred - A better role for bus travel"*, issued in 1999. This paper discussed a number of issues that need resolving but are not resolved in the Transport Bill currently before parliament:

- The conflict between encouraging integrated ticketing and the role of the Office of Fair Trading (OFT). Competition is useful in tendered services but it is often less so "on the road".
- Clarifying the scope for improved frequency over existing commercial routes through tendered services.
- Scope for clearer commitments within Quality Partnerships, e.g. to maintain services (all periods of day/week), fare levels and enforcement of traffic regulations.
- Value of having a small number of quality contracts, with careful monitoring as "experimental cases" outside London.
- Wages and working conditions of staff has worsened, causing recruitment and retention problems.
- Need to raise quality, e.g. impact of low floor buses, guided busways (Leeds/Ipswich), better passenger information, etc. There would be higher staff productivity through increased average loads.

The Transport Bill

The Bill has a relatively cautious approach - no changes in ownership, or general re-regulation. No substantial change in spending is planned, except making permanent the funding for recent additions to rural services, and £25 million toward a common minimum concessionary fare.

Concessionary fares: It is proposed that there is a common minimum half fare, but only for pensioners (not disabled people), with an annual pass charge of £5. This brings up to a minimum standard areas not covered (mainly rural). Note that only about 2% of local authorities do not have concessions for pensioners, covering about 1.6% of this group.

Proposals are perhaps rather inflexible - e.g. half-fare rather than flat fare, exact times of operation during the day. There is scope for less rigid definition (e.g. a scheme covering all pensioners and disabled, half or flat fare, locally

determined off-peak periods). Note that Wales proposes free travel (half fare since April 1999), and Scotland to include disabled people. There is a major issue of child concessions - there are few at present (as distinct from operators' commercial policy) and there is lack of a systematic school transport policy.

Taxis are omitted from the Bill. The effect of the 1985 Act was to liberalise and permit shared taxi/taxi-bus operations. However, there is a lack of comprehensive revised regulations, although minicab controls for London from 2000 (in the GLA Act). Cases have arisen recently in which the O-licence has been used for single-hirer taxis and also more extensive taxi-bus operations ("Group TaxiBus" in Bristol, Stansted, and Chelmsford; "Excellent Connections" bid at Bristol Airport). There is a need to clarify O-licence conditions when applying to taxis - concern of Western Traffic Commissioner that it would affect the concept of fixed route registered local service - and scope for encouraging taxi-bus/shared taxis to complement the bus network. However, application of VAT to taxi, but not bus, fares has been one of the factors making such developments more difficult than originally envisaged.

Quality Partnerships: Definition of legally enforceable agreements relates only to vehicle type, but this is less critical now since new vehicles must meet Euro2 engine emission standards and low-floor requirements. There is no specific inclusion of service frequency or fares, or periods of day/week covered (except for local voluntary agreements). It will not be possible to exclude "creaming-off" daytime inter-peak services. There is a large gap between this definition and quality contracts.

Quality Contracts: These are seen as applicable in extreme cases only, both by industry and government. But, this is a poor test of the concept. Local authorities tend to favour them, especially given the limited scope of Quality Partnerships. There is the case for a careful experimentation in representative areas.

Competition Act: There are clear conflicts since the Transport Bill requires joint ticketing schemes, which are in urgent need of resolution. There needs to be competition but not conflict - it is easier, e.g., to merge and take over companies than to co-operate, which is an issue that needs to be resolved.

Fuel Duty rebate: At present this is a crude system, but simple to administer. It effectively lowers unit operating costs, raising the level of "commercial" services. However, it omits community and school contract services, while including marginal competing local services. Simple removal would cause a large increase in local authority tendered operations and more commercial/tendered fragmentation in marketing and planning. A better

alternative is not yet clear. Sensible flexibility in applying fuel duty rebate penalty, on a sliding scale up to 20% - follows recent trend by Traffic Commissioners to use their powers more strongly in cases of poor service reliability (e.g. Stagecoach Cambus, Ribble).

Local authority role: An important role is in developing local bus plans and strategies. There is a question over whether local authorities have the necessary powers, or data to monitor changes in such plans in the absence of quality contracts. Local authorities have to produce a "bus service satisfaction" indicator as part of "best value" criteria, but if applied only to tendered services would give a limited view.

Example of London and the West Midlands

The West Midlands has seen the lowest percentage decline in bus patronage of all the Metropolitan Areas since 1985/86. Table 4 demonstrates these differences:

Table 4: Local bus services in English Metropolitan Areas

	Millions of passenger journeys			% change
	1985/86	1998/99	Change	
West Midlands	487	353	-134	-27.5
Greater Manchester	357	217	-140	-39.2
Merseyside	305	150	-155	-50.8
South Yorkshire	341	135	-206	-60.4
West Yorkshire	291	186	-105	-36.1
Tyne and Wear	287	154	-133	-46.3
All English Mets	2,068	1,195	-873	-42.2
London	1,152	1,279	+127	+11.0

Source: *A Bulletin of Public Transport Statistics Great Britain 1999.* DETR, November 1999, Annex B table 16

It is the conurbation most similar to London, albeit with distinct differences. The main factors of comparison are:

- Modest population growth 1991-96: 2% in London, 6% in West Midlands.
- Car ownership stable since 1991 in London with a growth of 4% in the West Midlands.
- Extensive Travelcard use (London almost all services; dominant operator in West Midlands).

- Free pensioner travel after morning peak, but also an evening peak restriction in West Midlands.
- Real fares index up by 40% in London, 42% in West Midlands 1985/86 to 1998/99 (Metropolitan Areas average was 64%).
- Average revenue per passenger trip (net of concessions) up by about 14% in London, about 38% in West Midlands.
- Bus kilometres up by 31% since 1985/86 in London, 26% in West Midlands
- High proportion of commercial operation (West Midlands) or small financial support (London).
- Changes in passenger trip 1985/86 to 1998/99: London +11%, West Midlands -28%.
- Average bus passenger trip length: London -6%, West Midlands +7%.
- Lower operator profit margin in London (about 12%) than West Midlands (about 23%).

Unless the differences between London and the West Midlands are attributed largely to a much higher fare elasticity in the latter, and/or the greater car congestion in London, a substantial difference would appear to remain, associated with regulatory policy. The variation in the role of rail systems between the two areas is the factor than differs most strongly than cannot easily be 'adjusted' for, hence the desirability of a systematic comparison between London and another area in which the quality contract approach could be implemented.

Discussion

John Cartledge opened the discussion by suggesting that the international phenomenon in the Heathrow corridor led taxis to "cream-off" passengers at bus stops. He also asked what is the point of child fares. Peter replied that this is historical; competition with the car so that travel at marginal cost. What is less logical is charging at all. It would seem to be justified to get children used to using buses.

Peter Collins commented on the Competition Act and the Transport Bill, saying that the latter seems to be ideological and that the relationship between the DETR and Department of Trade and Industry can be rather strained. Bus operators might agree to work together but they risked being challenged by the OFT. Given London factors should ridership be higher than it is? Peter White argued that some aspects could be better such as enforcing the net cost system.

Peter Gordon asked whether the problem was "hearts and minds"; e.g. the effect of television is that "anyone with clout does not use buses". Privatisation and deregulation seems to have been bad for the industry. Peter White thought that while this problem existed, the overall image was changing for the better. It's a problem that has still to be overcome, though.

Don Box opined that the thing that surprises him is that when quoting profits and income, there is no provision in the profit and loss account for renewal of the fleet. There seem to be sufficient profits, but do they renew?

Peter White's view was that operating costs include historic depreciation, and the industry is now making sufficient profits (a margin of at least 7%) to cover the difference between historic and replacement depreciation. It is possible to stipulate in contracts now for certain types of buses, and there is evidence of increased ridership with low floor buses.

John Cartledge asked Peter how optimistic he was of aspirations in the White Paper being fulfilled. If you look at some of the expectations put forward, he remains sceptical that the industry will do better than they have in recent years.

Peter White introduced his modest hopes for the future. A study by NERA for the Confederation of Passenger Transport on the expansion of Quality Partnerships nationally suggests that there is likely to be an increase in patronage of 2-6% in the Metropolitan Areas (+0.45% to 1.35% in rest of Great Britain outside London).

Also, a survey in Transit (29 October 1999) of bus industry managers and local authority officers found that:

45-50% of respondents expected growth of up to 5% over the next five years; 20-25% expected a growth of 5-10%; 1-2% a growth of over 10%; 10% expected no growth or were unsure.

With and illustrative existing modal split (Monday-Saturday motorised trips in urban areas) of 85% car, 15% bus, and if car traffic grows at 2% per annum, then absorbing one year's car growth would represent bus passenger growth of around 11%.

People have instant expectations - telephones, email, car when you want it. It is difficult for bus to offer this level of service.

Peter Collins thought that when people are stuck in cars in an urban area and they see buses going past, they might begin to think of transferring. The introduction of smartcards and low floor buses in London are all keeping bus

patronage high. A countervailing problem is the tendency for population to continue dispersing - marketing is continued pressure to spread out.

Peter White argued that there should be some scope for brownfield sites, concentrating in corridors and nuclear settlements to redress the balance.

Report by Laurie Baker

The Analysis of Congested Road Networks

Professor Peter Hills
Dean of the Faculty of Engineering at the University of Newcastle

A presentation to the Transport Economists Group
University of Westminster
26 April 2000

Introduction

There is concern over the way congested road networks are represented in a number of academic articles published in recent years. These demonstrate serious flaws and cannot at present satisfactorily assess the implications of road user charging. Many authors have attempted to model the build-up and dispersal of traffic congestion on an urban road network but most have found great difficulty in representing the dynamics of congestion adequately at a macro level, whilst avoiding the enormous complexity of individual vehicle-to-vehicle interactions at the micro-level. The difficulty arises not just on the demand side, due to the large number of behavioural responses available to trip makers who find themselves faced with congestion on the route they intended to use through a network, but also on the supply side, in that congestion does not just "well up" on all the links of a network simultaneously. Congestion will appear first at specific nodes on a network (usually towards the centre) and will then spread out from there.

Spatial Variation and Complexity in Networks

On networks clearly subject to congestion, only a proportion of their links and nodes at any given time will be congested. Even the logical extreme case of congestion on a network, i.e. gridlock, will not occur instantaneously across the network as a whole. In fact other parts might continue to flow freely. This means that any model formulated to represent the performance of an urban network under congested conditions must allow for the spatial variation of these conditions. Moreover the pattern of demand (i.e. whether trips are predominantly radial or orbital) will influence the locations where congestion is likely to arise, depending upon the shape and configuration of the network.

All the variables on both sides of the demand-supply equation (and the behavioural interactions between them) make the use of simple aggregate models highly questionable for the analysis of congested networks. For example, the idea of a network-averaged speed of traffic using different links, which happen to

have the same traffic flow, seriously distorts the analysis. This is because it ignores the dichotomy of two links, one congested and the other uncongested, delivering the same flow of vehicles per hour but at markedly different average speeds.

Parabolic Speed/Flow Relationships

The flaw in using a network- averaged speed/flow relationship lies not just in taking the arithmetic mean to represent a bi-modal distribution of speeds but also in deducing (wrongly) that the relationship is *monotonic*. For uncongested parts of the network, any increase in flow will cause average speeds to fall; however on congested parts, any increase in flow can only come about as a result of an increase in speed .Not only is the direction of these two relationships different but so is their causality.

Some authors appear to ignore the parabolic backward-bending speed /flow relationships, arguing that they do not exist in reality. This results in apparent inconsistencies in their analyses, since failing to bend back to the origin and hitting the *x*-axis (speed) at positive values gives infeasible positive flows at zero speeds.

Furthermore the performance of an urban network (with all forms of links and junctions) will also exhibit the same backward bending characteristics, when it is subject to congestion. As congestion increases (on some links but not others) average speeds will fall and queues will lengthen, causing the overall traffic throughput of the congested sections of the network to fall. This impairment of the efficiency of the network is difficult to represent properly in current models. However recent, as yet unpublished, work by May, Shepherd and Bates suggests that networks do indeed have backward bending speed/flow curves.

Dimensionality and related problems

A variety of units and dimensions have used in academic articles on road user charging to depict cost and volumes. A number, as we have seen, have adopted a flow-based approach. And difficulties arise when throughput or some other flow-based derivative is used as a measure of demand. This problem is compounded when (delay) cost/flow curves are mistaken for supply functions and flow-based "demand" functions superimposed on them. The interpretation of such "demand" functions, which may intersect several times with the backward-bending part of the "supply" function, is problematic. In fact, although the cost/flow curves are backward sloping, the corresponding supply functions cannot be.

A further fundamental problem is that time is both a resource component in terms of travel time, but also an exogenous constraint within flow based approaches in terms of the time period allowed to traverse the network.

Implications for the analysis of Optimum Tolls

Only by denoting the *x*-axis as "trips" instead of flow or throughput is it possible to overcome the above problems with backward bending speed/flow curves and the related difficult of generating logical marginal cost curves. This results in the expected units for the toll i.e. £/unit of demand and consumers' surplus to be £. The table sets out the units used or implied by a number of authors who have addressed these issues. Only Morrison of the flow-based approaches has the right unit for consumers' surplus but a problematic unit of measurement for the toll. The real issue is that they are all different.

Conclusions on a network-wide trip- based analysis

In order to evaluate the net social benefits of road user charging on a congested network it is necessary to adopt a network-wide trips based approach with the following characteristics:

- Proper specification of demand-"willingness to pay for accomplishment of desired O-D trips"-which implies a generalised cost/trip vs. trips domain
- Proper specification of supply – "generalised cost/trip of satisfying different levels of O-D demand for trips on the network"-which implies the same domain as for demand
- Observations of traffic flows, speeds densities etc are variable measures of performance of (parts of) the intervening network
- Although congested (parts of) networks always exhibit backward bending speed/flow, proper supply functions (generalised cost/trip vs. trips) are always monotonic
- Optimum tariff for congestion pricing cannot be determined generically, or in the abstract using simplistic aggregate models, however tempting
- This is because the optimum depends *(inter alia)* upon:

  -the actual pattern of demand for O-D trips;

  -the form and configuration of the network; and

  -the nature and extent of users' behavioural responses

Approach	Author (Date)	Labels used on		Implied Units for	
		Ordinate	Abscissa	Optimum Toll	Consumers' Surplus
Flow-based approach	Walters (1961)	Time of trip mile	Entrants	Minutes/trip-mile	Vehicles/trip mile
	Else (1981)	Journey Time (or costs)	Traffic Flow	Minutes/trip (or £/trip)	Vehicles/trip (or vehicle-£/trip-minute)
	Nash (1982)	Costs	Traffic Flow	£	Vehicle-£/minute
	Morrison (1986)	Costs per unit traffic flow	Traffic flow	£-lane-hours/vehicle	£
	Arnott et al (1990)	Cost	Number of vehicles	£	£-vehicles
	Se-il-Mun (1994)	Time (or cost)	Traffic volume	Minutes (or £)	Vehicle-minutes/lane (or vehicle-£/lane)
	Verhoef (1999)	Cost	Traffic flow	£	Vehicle-£/minute
Throughput-based approach	Evans (1992)	Congestion cost per vehicle-km	Flow (as % of capacity)	£/vehicle-km	£/vehicle-km
	May et al (1999)	"Supply time" per km	"Demanded travel" (vehicle-km/h)	£/vehicle-km	£/minute (or vehicles?)
Trips-based approach	Hills (1993)	Generalised cost per trip	Number of trips	£ per trip	£
	Yang and Huang (1998)	Generalised cost per trip	Number of trips	£ per trip	£

- Lastly, the optimum will almost certainly depend upon the objectives that are set for charging (of which *economic efficiency* is only one).

- Whatever model is used, it must be capable of representing these key interactions

Discussion

Peter Gordon asked whether it wasn't possible to get empirical evidence of the shape of speed/flow relationships.

Peter Hills agreed but said that observations of flows and speeds at a point are not representative over space and what is needed is a whole sequence of points over space but then one gets into aggregation problems.

Peter Gordon referred to the Cambridge congestion charging scheme, which only charged when traffic was congested and moving slowly

Peter Hills replied that this scheme, with which he had been directly involved, had only been a pilot covering three vehicles and had not been adopted.

Aileen Hammond pointed out that demand is not just for the trip but for the trip-end benefits associated with making the journey, hence more complex behavioural responses are relevant e.g. trip redistribution.

Peter Hills agreed and said that it depends on where one sets the modelling boundary and the suggestion may be more appropriate.

Peter Collins remarked that economists also have difficulty with dimensions, for example, quantity is treated as the *x*-axis when it really is the dependent *y*-axis .In congested conditions potential demand is not achieved, however, he considered that its intercept with the marginal cost curve should be the basis of the toll for the purpose of road user charging analysis.

Peter Hills referred again to the difficulty the various authors have in generating logical marginal cost curves.

Don Box said he was convinced that the trip-based approach was superior but there were pitfalls. He asked whether it could be turned into a policy tool.

Peter Hills confirmed his view that, if his criticisms are correct, we should be working on trip-based demand and supply. He reiterated his view that the optimum tariff for congestion pricing cannot be determined generically or in abstract using simplistic and aggregate models. The optimum depends on a

number of key variables including the configuration of demand, network and behavioural response and at the very least it should include route choice.

Report by Peter Collins

The London Mayor's Transport Strategy

Keith Gardner, Strategy Manager (Transport), Greater London Authority

Presentation given to Transport Economists' Group
University of Westminster
28 June 2000

Keith said that he would give an indicative talk about the Mayor's Transport Strategy given that it is likely to be overtaken by events. The Greater London Authority (Assembly and Mayor) goes live on Monday 3rd July.

London is currently in Round Two of Interim Transport Plans, interim between Transport Policies and Programme (TPP) and Local Implementation Plans (LIP).

Two things are clear:

- that the strategy and policy will be delivered at GLA, and
- service delivery will be with Transport for London (TfL); the Mayor also chairs TfL - i.e. joined-up London

Facts and figures

The Mayor has an executive role to:

- devise strategies and action plans
- prepare a budget (approx. £3 billion)
- act as a voice for London
- coordinate action to implement plans
- appoint Chair and Board Members

The Assembly has 25 members with a scrutiny role, and will:

- examine the Mayor's strategies and performance
- approve/amend budget
- examine London issues
- make proposals to the Mayor
- appoint staff (about 400) except 12 Mayoral appointees
- serve as members of the Metropolitan Police Authority (MPA) and London Fire and Emergency Planning Authority (LFEPA), and possibly London Development Agency (LDA).

Initially, most of the staff has come from the absorbed bodies: LPAC, London Research Centre and London Ecology Unit. The other bodies (TfL, MPA, LDA, etc) have a considerable number of staff.

Five functions:
Strategy (immediate) - 50% of staff
Performance and partnerships
Corporate services
Communications
Secretariat for Assembly
Small Mayor's office

General powers of the GLA are:
economic development and wealth creation
social development
improving environment, and
having regard to health

Eight statutory strategies:
- Spatial Development
- Transport
- Economic Development
- Air Quality
- Ambient Noise
- Waste Management
- Biodiversity
- Culture

The LDA will produce the Economic Development Strategy.

The Mayor also has a duty to publish a 'State of the Environment Report' for London.

As the Bill went through Parliament there was considerable debate about whether there should be an over-arching strategy that included education, health and housing.

Transport Duty

"To develop and implement policies for the promotion … Greater London" that covers passengers and freight.

The strategies have to be consistent with national and international policies and obligations, although the Secretary of State's powers are very limited. The

strategies also have to be consistent with each other and take account of the resources that are likely to be available. The transport strategy must also promote the use of the River Thames, make provision for people with mobility problems, and demonstrate that it is deliverable.

The borough LIPs cannot be produced until the Transport Strategy is in place. The Mayor will be working towards publishing, for consultation, the Transport Strategy, Economic Development Strategy and proposals for the Spatial Development Strategy by the end of 2000.

The Mayor will give guidance to TfL, the boroughs for their LIPs, national rail and bus services outside the London bus network.

Preparation of the Transport Strategy

It is to be an inclusive, partnership approach. The GLA will manage the Transport Strategy production, drawing on key expertise in TfL, the boroughs, (Shadow) Strategic Rail Authority. The scrutiny role of the Assembly is crucial: it will be interesting the see how the Assembly flexes its muscle.

Indicative timetable

The over-arching headline, "vision and objectives", are expected in July 2000, with initial consultation on Central London Congestion Charging between July and September. The draft Transport Strategy for "internal" consultation is expected in late October (for November's Assembly meeting). This will be reviewed and the public consultation draft prepared in December, with publication in January 2001. Consultation will last three months until end March 2001.

Guidance for LIP production will be issued February/March, ready for the first submission at the end of July 2001.

The consultation responses will be reviewed in April and May with revisions, as appropriate, during May/June. The Transport Strategy is planned for June 2001, which will allow detailed consultation on draft orders for the Central London Congestion Charging Schemes to begin and delivery around end 2002/ beginning 2003.

Initial thoughts on broad scope

Overall vision and objectives will be set out over the short- (3-4 years), medium- (8 years) and long-term (10-15 years).

The key themes of the Transport Strategy will include:

- Tackling traffic congestion
- Bringing the bus into the 21st Century.
- Efficient, integrated and safe rail network for London
- Managing the road network.
- London's national and international links, the importance of the London as a World City.
- Facilitating more sustainable transport - walking and cycling, use of IT
- An integrated system for London - the seamless journey.
- Improving the environment
- Improving the quality of life
- Linking locational and regeneration issues.

Congestion Charging Consultation (A London "Breaking the Logjam") [1]

The Mayor is considering preparing a paper for key stakeholders discussing the need for congestion charging and its context. It will set out the process for introducing a scheme and what the scheme will entail. Key issues for consultation are likely to include the charging area boundary, the charging regime and period, exemptions and discounts and the necessary complementary transport measures.

ROCOL[2] had moved the discussion on by stating that the technology already exists for automatic number plate recognition through digital cameras, and that a database can be used for enforcement.

Conclusion

In conclusion, Keith emphasised that there is lot to play for - to show that a democratic organisation can be successful, despite some of the flaws in the legislation.

[1] The Mayor issued a consultation paper *'Hearing London's Views'* in July 2000, setting out proposals for a congestion charging zone in central London.

[2] See *The Transport Economist*, Volume 27, number 2, Summer 2000 issue

Discussion

Mayer Hillman opened the discussion by remarking on the profound inconsistencies: (1) to the approach for seamless journeys, which is principally regarded as a public transport issue; and (2) the need to reduce the use of fossil fuels by a large amount mean it is wrong to think only about public transport. His great concern is that Lord Rogers sees London as a premier city of the world, which flies in the face of sustainable life styles. What is missing is a proper appreciation of the meaning of sustainability - the only solution is for local patterns of travel, walking, cycling and bus.

Keith remarked that Lord Rogers promotes higher density development to satisfy travel needs locally. Ken Livingstone has a long-standing interest in public transport - his vision is very much for public transport. A traffic reduction target of 15% means that travel demand will have to move towards walking, cycling and public transport. The strategy will say a lot about walking, cycling, density, and sustainability will rate high, although national government will also need to deal with the issue.

Hugh Wellesley asked whether there is quantity and type of transport skills available to do it? Keith replied that in the GLC there were 90 people out of 1200 in the department - in the joint GLA /TfL /ALG Transport Strategy Team there are a dozen people. The organisation will inevitably grow and will have to encompass a wider range of skills, such as looking at the psychology of changing people's habits. There will be a need to evaluate strategies through rigorous analysis.

Alan Watts (Camden) welcomed the practising of joined up government. Keith said that Strategic Development Group is charged with producing all strategies with small teams and a matrix of management. The advantage of being small is that interactions allow issues to be picked up. However, the acid test will be the production of the strategies.

Peter Collins was concerned about rail franchising and whether the schemes, such as East London Line extension, North London Line, West London Line and Thameslink 2000, could be progressed before the strategy is finalised. Keith thought decisions could be made on the East London Line extension and Docklands Light Railway before the strategy is finalised. The strategy is about making decisions and encouraging government to take schemes forward.

Aileen Hammond asked (1) whether workplace-parking levies had moved off the agenda and (2), when road user charging comes in, should the London Bus Priority Network be extended.

Keith said that workplace-parking levies were not in the manifesto since Ken Livingstone is keen on an alliance with business. Therefore, it is unlikely to be strong in the Transport Strategy. On (2), Keith thought that the London Bus Initiative would produce many new bus priority measures in the next two years, plus some more bus conductors and a package on fares.

Peter Gordon asked whether the consultation would be able to encompass so many disparate groups in London. Keith's view was that consultation method is still to be finalised. There is a need to identify the groups that exist and codify their aspirations - they also need to know what the Mayor can do, rather than advocate. There will be a need to understand what Londoners really think, possibly through focus groups. This is probably the biggest worry over meeting the needs of Londoners, especially with the different needs of children, the elderly, disabled, etc.

Report by Laurie Baker

Postscript

The draft strategy was submitted to the London Assembly on 1st November 2000. The draft was scrutinised by the Scrutiny Panel and the Transport Policy Committee of the Assembly, reporting to the Assembly on 6th December. Further progress of the Transport Strategy can be followed on:

http://www.london.gov.uk

REPORT OF SEMINAR

New Approaches to Transport Appraisal

Joint Transport Economists' Group and Transport Planning Society
Seminar held at the Institution of Civil Engineers
16 June 2000

REPORTS OF SEMINAR **Page**

Principles of the New Approach

Mike Walsh, Department of Environment, Transport and the Regions

Introduction and Background

The new approach to appraising transport schemes was announced in the Transport White Paper of July 1998: "A New Deal for Transport". The Roads Review was the first review to use the new approach and guidance on the methodology was published (3) in September 1998.

Multi-modal studies were implemented and guidance issued - GOMMMS (4) following the roads appraisal. Similar guidance was issued for Local Transport Plans (5), major public transport schemes (replacing circular 3/89) and for the South East Airports Study (SERAS), and the Strategic Rail Authority issued new guidance on the appraisal of railway investment [6].

The Main Objectives were to:

- implement the new transport agenda,
- provide consistency in appraisal across modes,
- give an evidence based policy
- be succinct information available for decision makers
- provide greater transparency
- give greater public acceptance of appraisal
- be a basis for more involvement/buy-in from public

The appraisal method is being implemented to:

- focus on the multi-modal context
- deal with broad principles as in GOMMMS
- (Derrick Jones and Gareth Arthur will discuss implementation for major schemes/light rail.)

Guidance is to cover process, the identification of problems, objective setting, the generation of options, modelling and the application of the appraisal framework.

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[3] *"Understanding the new approach to appraisal"* and *"Guidance on the new approach to appraisal"*, can be viewed on the DETR website: http://www.detr.gov.uk/itwp/index.htm

[4] *"Guidance on the Methodology for Multi-Modal Studies"*, May 2000 and

[5] *"Guidance on Full Local Transport Plans"*, March 2000 are also on DETR website above.

[6] *"Planning Criteria - Guide to the Appraisal of Support for Passenger Rail Services"*, June 1999 is on http://www.sra.ac.psiweb.com/publications/misc/planning_criteria.htm

The Appraisal Framework

In summary, this consists of:

- The Appraisal Summary Table (AST)
- Local and regional objectives
- Problem amelioration
- Supporting analysis for:
  - *Distribution and equity*
  - *Affordability and financial sustainability*
  - *Practicality and public acceptability*

The Appraisal Summary Table

The AST consists of five criteria/objectives:

- integration
- safety
- economy
- environment
- accessibility

all of which are split into sub-criteria or sub-objectives

The sub-objectives for the roads review and the multi-modal studies are:

Roads Review	Multi-Modal
Integration Sub-Objectives	
	• Transport Interchange • Land-use policy • Other Govt policies
Safety Sub-Objectives	
	• Accidents • Security
Economy Sub-Objectives	
• Journey times & Vehicle Operating Costs • Cost • Reliability • Regeneration	• "Transport Economic Efficiency" ┌ Users ┤ Operators └ Government • Reliability • "Wider economic Impacts" (Regeneration)

Roads Review	Multi-Modal
Environment Sub-Objectives	
• Noise • Local Air Quality • Landscape • Biodiversity • Heritage • Water • CO_2 box	Roads sub-objectives plus • Physical fitness • Townscape • Journey ambience • Greenhouse gases (replaces CO_2 box)
Accessibility Sub-Objectives	
• Public Transport • Severance • Pedestrians and others	• Option values • Severance • Access to transport system

Transport Economic Efficiency

- TEE uses the results of a cost/benefit analysis, but excludes accident benefits - covered under Safety.
- This is the approach adopted for GOMMMS, which is designed to handle *multi-modal* projects.
- It allows the effects on different groups to be presented separately

History

- COBA - designed for road schemes, no allowance for charges.
- CAF - designed by Institute of Transport Studies at Leeds and MVA for multi-modal studies, but complex
- Prof. Sugden, University of East Anglia - recommended two changes in convention, which affects presentation of results, but not their substance

The Changes

- From a methodology (or calculus) based on *social costs* to one based on *willingness to pay*:
  - the calculus of social costs measures the change in *resources* used by society as a whole - it ignores transfer payments
  - the calculus of willingness to pay measures the *net welfare change* for each individual - transfer payments must be taken into account

- From a *factor cost* unit of account to a *market prices* unit of account
  - merely a change in the unit of account
  - the factor cost price base uses prices *net* of indirect taxation
  - the market price base uses prices *including* indirect taxation

There is no *formal* link between the price base and the calculus, but it seems more natural to use market prices with the calculus of willingness to pay

The TEE Worksheet

Results disaggregated into four groups:

- transport users - further disaggregated by mode and by impact
- private sector and public sector providers - both disaggregated by mode and providing information on revenues, operating costs, investment costs and, for private sector, grant and subsidy income
- other government - disaggregated by mode and providing grant and subsidy payments and indirect tax revenues

Local and Regional Objectives

Allows studies to be tailored to:

- local circumstances
- planning guidance
- development plans
- aspirations of local groups

Must be fully up-to-date and must nest within the five main criteria

Supporting analysis

a) Distribution and equity. The methodology is designed to allow disaggregation of impacts:

   - By area/location
   - By household type
   - By income

   In practice this is likely to be limited by available data and models, but is so often the focus of decision-makers so it needs attention.

b) Affordability and financial sustainability recognises that decisions will take into account the financial impacts, and identifies impacts on both

- private sector providers and
- public sector providers

It identifies such elements as:

- Is proposal self-supporting in operation?
- What is overall size of deficit?
- Are all groups recompensed?
- What subsidies may be required?
- Are they likely to be fundable?

c) Practicality and public support will address issues such as:

- Feasibility
- Enforcement
- Time-scale
- Phasing
- Conflicts
- Political dimension
- Opinion evidence

Conclusions

Mike Walsh's conclusions were:

- The new approach marks a significant development
- But was founded on recognised methods
- A number of issues are still unresolved, and
- We are learning by doing!

Multi-modal and Roads-based Studies: Research and Observations

Tom Cohen, Steer Davies Gleave

This presentation considered an overview of research done by the speaker with a summary of the general finding and recommendations. It included a discussion of the role of objectives and appraisal.

Overview of Research:

Transport 2000 have expressed a number of concerns in relation to assessment methodology:

- Level playing field (measures, modes)
- Is NATA up to the job?
- National and local objectives and targets

Summary of General Findings

- Interviews with stakeholders produced a stream of proposals.
- View on how to respond to SACTRA's Economic Impact Report proposals
- Opportunities to exploit as well as problems to solve
- Alternatives may breach geographic and policy limits
- Option generation
  - Must not be limited by previous assumptions or provisional scope of study
  - Should be inclusive
- Consultation should be more inclusive so that the result is better and should be based on representative sampling
- Responsibility for objectives and actions at close
- Modal shift only one of many potentially desirable outcomes
- Objectives could include a SMART environmental end-state

The Role of Objectives

The study came to specific conclusions about the role of objectives:

- That it should reflect relevant issues in the study area.

- National, regional and local targets need to be taken into account
- Objectives should be developed by stakeholders
- Objectives should be expressed as SMART "end-states"
- Guidance is still limited
- There is a tension between objectives and problems
- Unresolved tension between NATA objectives and local objectives
- Opposition to SMART objectives is due to:
  - Need to find a sensible target
  - The implied equivalence of objectives.

Appraisal

Specific study conclusions

- Fulfilment of *study objectives* is the appropriate yardstick
- The role of NATA is as a framework, not a decision tool
- *Profile statements* rather than Net Present Value
- Elimination of inconsistencies in appraisal methods (e.g. s56 [7])

Notable developments

- Section 56 is now dead
- "Impact on problems" (some resemblance to *profile statements*)
- A single value of non-working time
- Investigation of cost-effectiveness approach in regeneration contexts

Current state of play

- Multi-modal NATA is cost-benefit analysis nested within multi-criteria appraisal, that includes the weaknesses of both
- Consumer surplus theory underpins cost-benefit analysis
  - sacrifice of information
  - only existing and future users count and
  - implicitly endorses initial endowments
- The multi-criteria appraisal has four dimensions:
  - alternative strategies

[7] Section 56 of the Transport Act 1968

- scores against criteria and sub-criteria
- groups affected
- yardsticks

- Certain constraints are presented as objectives

Conclusion

In conclusion, Tom Cohen suggested that NATA is not very good at deciding between competing schemes. There is a distinction between guidance on *how* to measure and *what* to measure.

There appears to be problems of a "derived demand" and what is wanted in the study area. There are also implications of separating appraisal from the decision - there is sophistry when the decision is made in camera.

London Transport Intermediate Modes Studies

Elaine Seagriff (London Transport) introduced the next two speakers who would deal with case studies and appraisal framework respectively. London Transport had used cost-benefit analysis for years but it did not tell us much about how objectives might be achieved. With the huge, complex movements in London, how are decisions made on which schemes to take forward?

(a) Case Studies of Intermediate Mode Schemes

Martin Stuckey, London Transport Strategy and Development

Any intermediate scheme should achieve a number of objectives:

- Support sustainable transport policies
  - Improved transport quality and safety
  - Encourage greater use of public transport and reduce car use
  - Achieve a cost-effective solution
  - Fully accessible vehicles
- Support planning objectives
  - Improved access to town centres, rail stations and regeneration areas
  - Reduced environmental impact of transport
  - Aids regeneration/redevelopment
  - To assist development and regeneration

Originally nine corridors were studied, which were reduced to four new corridors plus Croydon Tramlink. The assumptions made in the studies were:

- Apply principle of road space reallocation where necessary and practicable
- Operation through pedestrian areas.
- Restraint measures identified.
- Tram, guided trolleybus, gas bus and Euro III diesel buses considered across the schemes
- Alternative development assumptions where appropriate

The project development studies were:

- Partnerships between London Transport and local authorities
- Alignment engineering and costs

- Public transport modelling
- Highway modelling
- Bus planning and operating studies
- Multi-criteria assessment framework

Chosen Case Studies

Waterfront Transit

This is assumed to be a bus or tram based option along a 15-km corridor between Greenwich and Thamesmead. It would link regeneration sites, tourist sites, town centres and residential areas. There is a street running option as an alternative to new road alignment through developments. It will provide feeder links to key interchanges, including the Jubilee Line extension. It is assumed to be incremental development, building on the Millennium Transit.

East London Transit

This is assumed to be a bus-based system along a 53-km network in Barking and Romford. It would link regeneration sites to town centres and residential areas, providing orbital and feeder links to key interchanges. The systems considered were guided trolleybus, gas bus and Euro III diesel buses.

Uxbridge Road Transit

Bus and tram based options in a 20-km corridor from Uxbridge to Shepherds Bush were considered. It would link town centres, development sites and residential areas, providing radial connections and feeder links to key interchanges. It would rely on road space reallocation in key town centres and significant modal transfer is anticipated.

Cross River Transit

Bus and tram options have been considered for the 15-km corridor between Camden Town/King's Cross/Euston and Waterloo/Peckham/Camberwell. It is designed to increase central London capacity, forming a key part of the strategy in the central area. It would provide links, dispersal and relief for key interchanges in central London and serves significant areas of deprivation/ regeneration. It could provide the "carrot" for other restraint measures.

Conclusions

A large amount of information was produced. This required significant resources and data, and requires detailed knowledge of methodology and data inputs. Storing and presenting data to assist clarity can be a problem, but it does provide valuable data for use in consultation

The information flags up detailed impacts to potential objectors at earlier stage, which leads to debate, that can optimise options or stop them earlier.

The method provided a comprehensive and consistent approach, but tailored for London. It provided information that different stakeholders can relate to and has helped engage interested parties in meaningful debate

The speaker believes that this approach should lead to better schemes being developed but:

- At perhaps greater cost for initial (not total) scheme
- Could delay decision-making, as the results do not give a straightforward best answer.

(b) Multi-Criteria Assessment Framework

Kevin Austin, Halcrow Fox

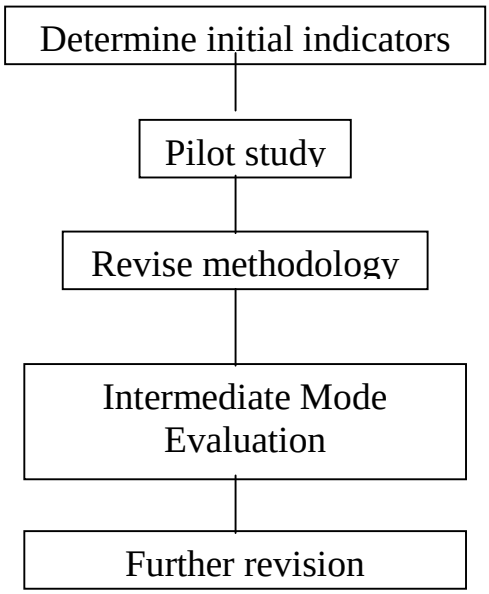
Kevin described how the framework was developed, the general principles, the Framework and assessment process.

Development of the Framework

In 1992/93 the South London Rail Study and in 1993/94 the Woolwich Metro/ Thames Gateway work both used cost-benefit analysis. In 1995, over 50 intermediate mode schemes were sifted using a qualitative objective-led approach. This was followed in 1996 with a quantitative objective-led assessment of the nine intermediate mode schemes.

From 1998 onwards three developments took place:

1. A review by DETR of their "New Approach to Appraisals"
2. Relationship with internal appraisal processes in London Transport
3. Continued development of MCAF



General Principles

Any framework has to be applicable to London. It has to use readily available data and techniques such as Railplan ME2 public transport model), Saturn (capacity road traffic assignment), CAPITAL model (calculation of public transport accessibility) and LT Emissions Model.

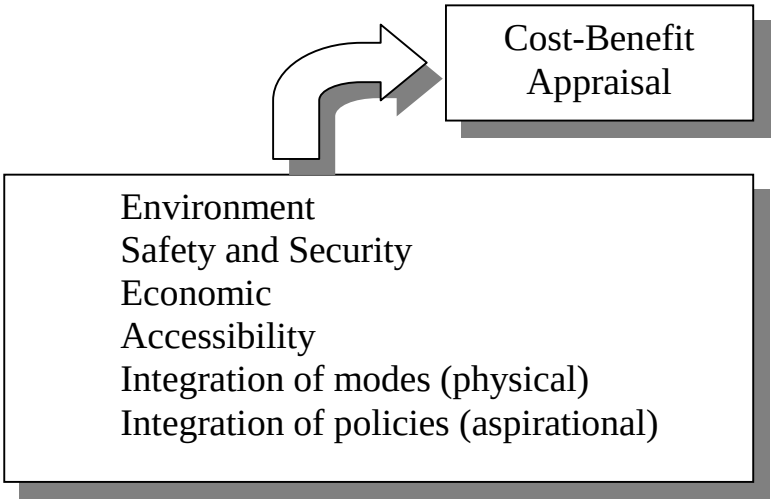
The output has to be provided at a macro and micro level. It has to be quantified using understandable values (e.g. number of people who benefit or disbenefit) and it must provide more than just evaluation scores.

For example, the change in accessibility in Barking by introducing an intermediate mode scheme is illustrated in the following table:

Time Band	Population	
	Do-minimum	Do-something
0-10 minutes 10-20 minutes 20-30 minutes	10,093 110,773 239,962	33,984 233,511 289.647
Total 0-30 minutes	360,828	557,142

The Multi-Criteria Appraisal Framework

The Indicators are:



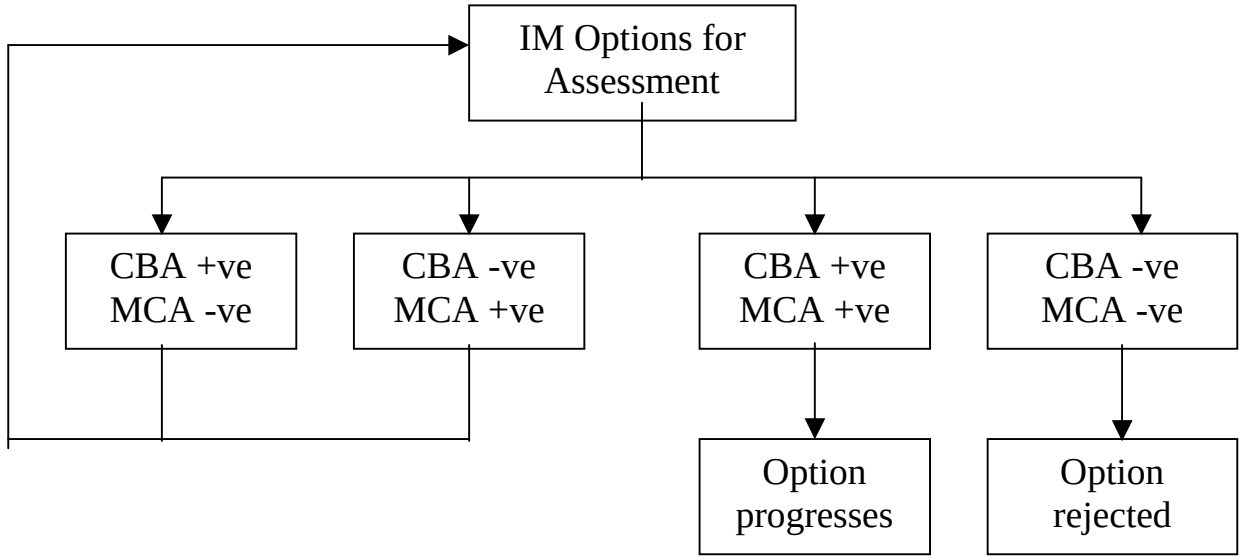
The assessment framework uses cost-benefit appraisal, environmental assessment and movement-direct effects. The movement effects measures economic (capacity, transport use), accessibility (other modes, public transport) and integration of modes. Finally, the derived effects are measured - achievement of policy goals

Assessment Process

There are various levels of detail, both temporal and spatial.

Temporal levels are:	Spatial levels are:
Pre-feasibility	London-wide
Feasibility	Scheme
Detailed	Hotspots

The diagram below illustrates the process of appraisal using both cost-benefit analysis (CBA) and multi-criteria appraisal (MCA). Only when both CBA and MCA give positive answers does the scheme go forward. With one of them negative, then the scheme goes back to be redefined. If, at the end, both are negative then the scheme is rejected.



Issues

The method provides pros and cons of each option in a structure way. It is equally applicable to London-wide objectives and local objectives. It is based around the ultimate effects of a scheme as it affects society in general and individual groups of people. The graphical output is clear and it can be used as a check on other work.

However, the methodology is time-consuming and it is reliant on the accuracy of models and data. It can prove difficult to achieve a consensus.

DETR experience applied to light rail

Derrick Jones and Gareth Arthur, DETR

Outline

The talk covered the following aspects:

- A brief review of Light Rail policy in UK
- Light Rail and the Transport White Paper
- s56 Appraisal Methodology/NATA
- Application of NATA to Light Rail

UK Policy towards Light Rail

Historically, trams were replaced by bus during the 1950s. In the late 1980's transport policy changed with:

- growing role of private sector
- bus privatisation/deregulation

Circular 3/89" appraisal methods sought that the beneficiaries pay, i.e. the user and developers. Government grant was available, however, for quantified non-user benefits.

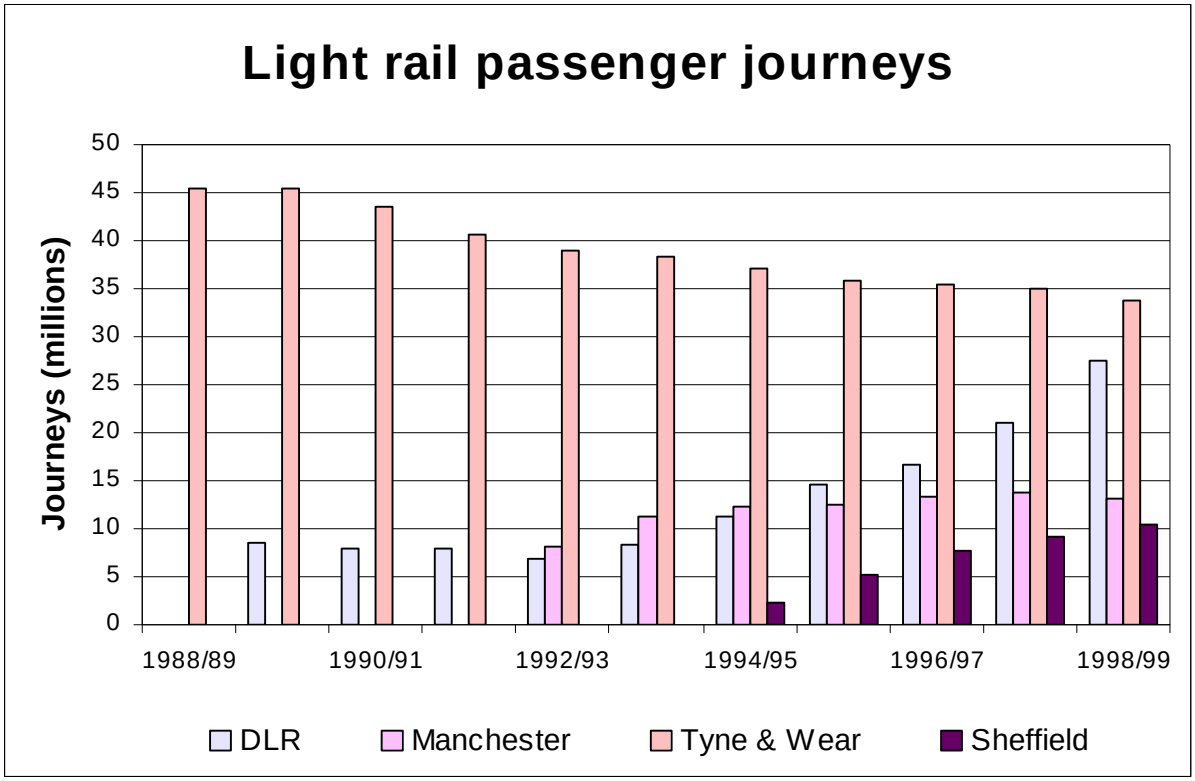
Recently light rail systems in England have been developed at:

- Tyne and Wear
- Docklands
- Manchester
- South Yorkshire
- Birmingham (1999)
- Croydon (2000)

The graph shows the annual passenger journeys on four of the systems since they have become operational.

Light Rail and the Transport White Paper

Light rail has a role in delivering integrated transport - in the context of Local Transport Plans. However, light rail costs are high and buses may be more cost-effective, although in future, local authorities can use congestion/parking charges to fund light rail schemes. However, they are not seen as a funding priority.



A report in the Financial Times on 15th June (day before the seminar) announced that the government would be pledging billions of pounds to reviving a network of trams in Britain's towns and cities, believing they will help ease town centre congestion. A government "insider" was quoted as saying: *"There's growing evidence that trams work. In Birmingham they leave every six minutes, you don't need a timetable, they're quicker, more comfortable and classier. We want to see a substantial increase in the role of light rail in our larger cities over the next 10 years,"* So the prospects for light rail seems to be improving!

Section 56 Appraisal and NATA

Section 56 of 1968 Transport Act gave government the power to give Capital Grant, subject to approval by Her Majesty's Treasury. Those who benefit directly should pay (as stated in circular 3/89), which applied to:

- Users through fares
- Developers/landowners through joint funding

Where full costs were not covered, government grants available for quantified non-user benefits such as relief from traffic congestion, reduction in accident costs and improved environment, regeneration, etc.

Circular 3/89 and S56 "rules" require:

- Good value for money compared with the alternatives
  - Total cost less than total scheme benefit
    - (revenue + developer contributions + non-user benefits (e.g. via decongestion) + consequential savings)
  - Public sector contribution less than non-user benefits
  - Operating costs less than operating revenues
- A "Restricted" cost-benefit analysis can be undertaken, but "Full" cost-benefit analysis is also undertaken.

S56 and New Approach to Appraisal (NATA)

- The NATA framework is now applied to s56 schemes
- Revised approach outlined in full Local Transport Plan and subsequent major schemes guidance:
  - Use of five-criteria NATA framework in s56 appraisal
  - Require Full cost-benefit analysis
  - Drop emphasis on restricted cost-benefit analysis
  - But, financial sustainability still important

The appraisal is now based on NATA "Famous Five" Criteria/Objectives:

- Integration
- Safety
- Economy
- Environment
- Accessibility

Experience with applying NATA to Light Rail

It is new territory, which has been a learning experience. The NATA approach has currently been applied to a number of existing schemes, ahead of recent detailed major scheme guidance. The NATA Appraisal Summary Tables have been produced for:

- Sunderland extension
- Manchester Metro extensions, and
- Nottingham (PFI)

The Light Rail NATA results show that NATA works! All three schemes performed well in NATA terms and in full CBA terms. However, a restricted cost-benefit analysis test has not been applied.

Detailed Guidance on Major Public Transport Schemes
This was released on 19 May 2000, replacing circular 3/89. It covers all NATA criteria and provides a consistent approach and methodology. It will be updated later.

Conclusions

The NATA methodology can be extended to cover all public transport, including Light Rail, with light rail schemes now in context of Local Transport Plans:

- Appraisal advice in Local Transport Plan guidance and Major Public Transport schemes document
- Early light rail applications of NATA show encouraging results
- It is a learning process.

Discussion

Jonathan Roberts (Citigate) was struck with extreme detail available and appropriate with change in policy. In terms of rail franchising - macro-economic and micro-economic scale is required in projects. But, is the appraisal criteria valid for 20-year franchises?

Walsh was sure that the OPRAF (SRA) approach is consistent with New Appraisal Methods, including the effect of economic growth. The guidance is robust and can support decision, although it can be problematic at strategic levels. A related issue is when used in multi-modal studies: Railtrack and Train Operating Companies are on the Study steering groups.

Andrew Last (MVA): There is a tendency to use cost benefit analysis to provide a one-off test for single schemes as a means of reaching a decision. It should be used as part of a continuous process as a project is developed, provides a database of 'impacts' from which to choose interesting aspects. He sees the tools as a need to build-up consensus from a range. Detail required is horrendous for evolving strategies. Private travel time to be included as a cost. He asked two questions: (1) how applicable are the ideas to general transport strategies since huge amounts of data are required and (2) should increased car costs be treated as a benefit rather than a cost, when they arise as a result of traffic calming?

Walsh cannot agree to include increased travel time as a benefit. The appraisal should identify what environmental benefits etc. traffic calming brings, rather than regard the delays themselves as benefits. Appraising strategies by new methods is quite a task. Local authority efforts to appraise their LTPs help. DETR must seek detailed information to support the process, which is robust. One of the method's strengths is its ability is to look a two levels, with less detail at the strategic level.

Peter Gordon is the calculation of decongestion benefits valid to justify schemes? What is the validity of different values of time?

Derrick Jones responded**:** The traffic reduction achieved is important and needs to be taken into account. The 'value' of work trips is a cost to employer.

Walsh: Problems are subjects for research, with huge issues existing that need resolution. There is continuous improvement, but the best available data are used. The problems are largely empirical and not conceptual.

Gill Beardwood was worried about rejection of consumer surplus because that

loses benefits. For example, London schemes can have a large redistribution effect.

LT speakers retorted that they did include consumer surplus!

Mike Russell. The new government of 1997 demanded a new approach with integrated transport. NATA's great strength is the return to fundamentals, getting rid of a lot of the garbage that surrounded appraisal. On the five criteria: what if everything is favourable, why include integration?

Walsh: The "five" were a political requirement, being a reflection of the trends and emphasis of the day.

Chris Nash (Institute of Transport Studies, Leeds): Rerun of problems of objective targets - the objectives are drawn so wide there are problems of 'putting them into practice'. Do targets have a real role? Setting targets before analysis maybe dangerous.

Walsh: Targets are now a way of life but should emerge from appraisals. It is important to be able to debate everything that is important to people. Ideally, targets would come out of the appraisal process, but it has to be recognised as a fact of life.

Cohen: Difficulty of achieving targets does not diminish their value, since it will test if you are going in the right direction. Appraisal is sometimes characterised as being independent but, in effect, it is not neutral.

Tessa Sayers (University of Newcastle): There appears to be an absence of a structured way of making a decision. What is the feasibility of bridging the gap between AST and the decision? There is a need for accountability and transparency in the process.

Walsh: On the question of transparency, the AST is published and ministers have full access to all the data in the decision-making process. The appraisal itself is not the decision-making process but it is part of the political process. Ministers are made more aware of the implications of their decisions through the process.

Aileen Hammond: MCAF is useful because it shows the relationships between schemes. It allows politicians to go back to officers to improve schemes.

Publications announcement

The editor has received notice of two publications that might be of interest to members:

Air Transport Networks by Kenneth Button, Professor of Public Policy and Roger Stough, NOVA Endowed Professor of Public Policy, School of Public Policy, George Mason University, US, ISBN 1 84064 429 X. Edward Elgar Publishing, £65

Air Transport Networks provides an economic analysis of the way in which air transport industry operates and the nature of the policies that have been adopted to regulate the sector. The book covers domestic and international air transportation with an emphasis on airlines and includes discussions of related markets such as airports and air traffic control. Details are provided of how the sector functions and the reasons why the airline industry performs as it does today and explores the ways in which governments have, over the years, attempted to manipulate air transport markets to meet political objectives.

Transport Policy: The myth of Integrated Planning by Professor John Hibbs, Director, School of Transport Studies, University of Central England. Hobart Paper No. 140, Institute of Economic Affairs, ISBN 0-255 36493-8. IEA £10 (plus £1.00 p&p, UK and Europe)

Transport Policy presents the view that government failure is at the root of Britain's transport problems. Rail privatisation was over-hasty, which has been compounded by the present government. He argues that the government should reconsider the functions of the Strategic Rail Authority, dismantle the rail franchising system and redesign rail infrastructure pricing to give improved investment signals.

According to the author, a central problem is that there is infrastructure pricing for the railways but not for roads. Treasury control of road spending results in inefficiency. The author calls for an autonomous funding agency for roads, which raises money from electronic road pricing.

He argues that transport industries would serve the public better if political and bureaucratic interference were much reduced.