Towards an evidence-based charging policy for transport infrastructure

UNITE

UNIfication of accounts and marginal costs for Transport Efficiency

17 – 18 September 2001
Venue: Ecole nationale des ponts et chaussées, 28 rue des Saints Pères, 75007 Paris

Discussion

Monday 17 September 2001, 0915-1700
The evidence necessary for pricing reform

0915-1000 Opening proceedings

Hugh Rees - 'The Commission's priority areas for transport pricing reform'

The EU's last Common Transport Policy document was agreed in 1992. Since then transport growth has exceeded economic growth. What we can see today are high and increasing levels of congestion between the main cities of the Community. Road, rail and air traffic, emissions and fuel consumption are rising. Going forward, these increases are unsustainable. Having identified the problems we must go on to address them through policy.

Solutions relevant today differ from previous decades. Regulations and rules are not possible as they were in the 1970s. Investment remains an option, but in the long term can this be a way out of the problems described? As shown in the new European Transport Policy (ETP) White Paper [http://europa.eu.int/comm/energy_transport/en/lb_en.html], the Commission is committed to a package of policy initiatives, which include selectively better infrastructure as part of a wider policy framework.

Analysis conducted for DG-TREN shows that in the Do-Nothing scenario - without the new policy initiatives - between 1998 and 2010 there is likely to be:

- 40% freight traffic growth;
- 38% passenger traffic growth;
- 90% growth in air transport specifically.

The new (or rather 'revised') ETP is linked to objectives set in Lisbon. New technologies have a key role. Transport must be efficient and able to handle the demands made on it.

Development of better intermodal policy has been a major concern: for example, connectivity between high speed rail and air services to encourage shifts towards the cleaner mode between major European cities. Links are being encouraged between road freight and maritime modes, and inland water services.

Enforcement of rules will be crucial in the road haulage sector, which currently faces a problem of low levels of profitability. Some owners break rules on driver hours etc. to get round this.

In the rail sector there is a clear judgement that we could do better: indeed we have to do better, both in passenger and freight service provision.

Other policy aims are: that fiscal policy should be set to better reflect environmental policy; development of more environmentally-friendly fuels (hydrogen-based); taxation for aviation fuel; pricing of transport in general. A Directive is being prepared to set the rules for future pricing: this will concentrate on road freight, km-based charging, peak periods etc. Revenue from pricing systems will go back into the transport sector. There are also proposals for new priority investment projects - including conversion of the Spanish Rail Network to European standard gauge.

60 different measures are contained in Annex 1 of the new White Paper. Once considered and approved, these could open new possibilities for measures to be considered after that. There is broad agreement on some of the measures already - some are considered too strong; others not strong enough. We need to make sure that the pricing system which is put in place, is both practical and understandable to citizens. Encouragingly, we already see German, Dutch & Austrian moves towards km-based pricing systems and pricing for heavy vehicles. The first responses to the White Paper have been very positive.

Question: asked whether it was intentional that the new ETP is vague on what infrastructure costs are to be charged for. Is it just marginal damage costs? HR stated that the principle is charging based on marginal social cost, including not only damage costs but congestion costs, however that mark-ups are also important where financing issues arise or congestion is low.

Chris Nash - 'Introduction to the UNITE project on transport infrastructure charging'

No questions raised.

1000-1300 Session 1: Transport accounts – what are they and how can they contribute to policy development?

Markus Maibach - 'International experience of transport accounts'

Comment: suggested that for road and rail sectors as a whole the balance between costs and revenues was less of an "equity" issue than the balance for different types of user within the modes. MM agreed, pointing out that issues within a sector, e.g. the balance for road passengers and freight, is often more interesting than the overall modal balances.

Question: contrasted the UNITE social transport accounts with private sector company accounts. Company accounts serve two main purposes: to provide information on profitability and whether the asset base is increasing or decreasing in value. Accounting conventions are very clear: there is 'no uncertainty in the task of an accountant'. In social transport accounts, there is more uncertainty over the valuation of environmental and congestion effects, new values are issued every year by the research community. Is there a danger of major distractions due to changes in unit values? Is there a risk of this obscuring underlying improvement in the transport system - these are issues of major concern to ministers and citizens? MM acknowledged this concern and also said that the use of accounts for performance monitoring has been very rare to date. (See also Henrik Swahn below).

Question: queried what was meant by the "open" nature of the UNITE accounts. MM stated that what is possible for different modes and countries varies enormously, so that the framework produced in UNITE has to be responsive to the types and quality of data different countries have.

Question: enquired whether the political economics of the way in which accounts are used had been explored? MM replied that the accounts provide basic information about social costs of transport and are not prescriptive about their use in policy analysis. Chris Nash added that information needed for implementation of EU policy is at the centre of UNITE, and that marginal social cost is not the only consideration in EU policy. Therefore one of the actions at an early stage in UNITE was to talk with policymakers about what evidence on costs they need. The design of the accounts reflects these needs. One of the interesting aspects of the project had been the different emphasis placed on marginal versus total costs by different countries, and the difference in their requirements for information. The ‘open scheme’ would allow policymakers to use what is helpful to them. Chris Nash also noted that the accounts had been a long-standing request of Member States.

John Nellthorp - ‘Alternative transport account concepts’

Comment: noted that with company accounts asset valuation procedures are very complicated, err on the side of conservative valuation estimates and contain great uncertainties. The uncertainty of social transport account entries relative to business accounts should not be over-emphasised.

Comment: urged caution in re-building new systems of monitoring and accounting, pointing out that many airport accounts, for example, already include the costs of noise insulation of nearby housing. Furthermore, airports were complex multi-modal transport nodes so that associating all terminal costs with aviation would be misleading. JN acknowledged such concerns, but also noted that full noise mitigation is impossible so that existing company accounts are not comprehensive.

Marc Gaudry - ‘National satellite accounts and their use in cost calculation’

Comment: that the average trip and user do not exist, and that in the analysis, market segmentation is important. The evidence indicates that marginal costs are also very different for each type of trip in the market. Does this not imply there are difficulties charging for externalities? MG replied that charging for pollution externalities is relatively straightforward. His doubts were only about the club good problem and the ability to apply marginal cost pricing.

Comment: that the main point Gaudry had addressed was interaction. This was everywhere in the market, eg. congestion arises at check-in, at the airport runway and in air traffic control. There is a distinction between the Nash equilibrium (=Wardrop 1, selfish-egoism) and the Pareto optimum (=Wardrop 2, people deciding corporately in the interests of the collective). Can an analysis based on the average cost curve represent peak hour conditions? In planning public infrastructure we must address these aspects of behaviour.

Stefan Suter ‘Policy perspectives offered by the Swiss pilot accounts’ and Tom Sansom for Heike Link ‘German pilot accounts – results and potential policy implications’

Question: asked if there is an intention to produce German maritime accounts, whether the issue of PM_{10} production from railways due to braking etc. had been considered, and the issues of competitive distortions in road haulage markets across countries. TS noted that maritime accounts would be produced for Germany.

Comment: suggested that assumptions about the value of statistical life and environmental unit values are crucial in determining the results. For example €20/ tonne of CO_2 is used in the accounts, while the recent UIC study used €130/ tonne. SS noted that €20/t was used with a €80/t sensitivity in the Swiss accounts.

Question: queried whether all environmental costs are borne outside the transport sector – surely some are imposed by users on themselves? SS agreed it was important to be clear on this distinction - the UNITE accounts related to environmental damage external to the transport sector.

Chris Nash closed the session and noted the high level of interest that the transport accounts produced in UNITE had prompted.

1400-1700 Session 2: The role of marginal costs in pricing policy

Jean Tirole - 'Scope and limits of marginal cost based infrastructure charging'

Question: acknowledged the importance of incentive mechanisms and asked what the role of a cost-based pricing approach could be. JT noted the dangers of marginal cost pricing without appropriate incentives for operators to control costs. Without such incentives operators could call for new projects without any responsibility for bearing the costs. But with average cost pricing there could be enormous volatility in prices for new infrastructure; if demand were lower than forecast increasing prices could lead too a spiral of reducing demand and increasing prices - co-operatives can be unstable.

Question: the relationships between fixed and variable costs could vary enormously by mode, vehicle types, area types and travel conditions – how could this be dealt with in pricing policy. JT observed that in the telecoms sector funds obtained from the majority of users are sometimes used to contribute to the fixed costs of the less well off - for example rural telephone users. He noted that the money comes from within the industry, and taxpayers' money is not involved.

Comment: contrasted the size of economies of scale within the telecoms and rail sectors. Surely the rate of structural change in the telecoms sector means that comparisons across these two sectors have limited meaning? JT reiterated that the same principles apply in all sectors, but experience indicates that different regulatory solutions are needed - 'the lesson learned is that it is hard to tell in advance'. For example, in telecoms, the main constraint has turned out to be access to the local loop, not long distance networks. In electricity, generation has turned out to be highly competitive. In rail, it seems the key issue will be to attract investment, both in infrastructure and services. A key challenge will be to incentivise and co-ordinate complementary investments.

Question: to what extent is a unified accounting system such as the UNITE accounts needed? JT replied that good information on costs and international benchmarking can be extremely valuable to the regulator. Collection of information is tremendously important and we need institutions which do that well, whether part of the regulator or independent research groups.

Question: queried whether, in circumstances of active intermodal competition, there was less need for regulation. For example, some parts of the rail market were strongly monopolistic whilst others were more competitive. JT replied that in many circumstances customers will be captive to a mode. Under these conditions price discrimination among consumers is not necessarily a bad thing, but there is a possibility that once a firm or household has decided to invest in a particular area, there is a risk that the infrastructure owner will exploit this commitment by asking for more money. In assessing whether there is a need for regulation, it is necessary to think about the specific categories of consumers and whether any of them will be captive.

Jan-Eric Nilsson - 'Developments in the estimation of rail maintenance costs'

Comment: commented that major renewals expenditures for railways can be three times as much as the maintenance costs included in the analysis presented. How can pricing cope when such information is absent? JEN commented that this is the reality of the data availability situation, with partial information.

Question: queried whether the output of the analysis was a cost function. JEN responded that the elasticities with respect to track length and traffic were merely a different way of expressing the response to increased load, and could easily be used to drive marginal cost estimates for track use - see his slides.

Question: for example, SNCF has very different maintenance regimes for low and high traffic lines – had this separation been identified in the Finnish and Swedish rail maintenance cost analysis? JEN replied that most lines have mixed traffic, but that the main difference is that where double-tracking exists maintenance can be much less disruptive and costly.

Comment: felt that the transferability of the results is open to question due to the very different definitions of maintenance and renewals in different countries. This affects what appears on the current account and what on the capital account. JEN agreed this is an issue to be aware of when attempting to transfer the results.

Gunnar Lindberg - 'Assessing accident costs for road transport'

Comment: wondered whether the low elasticities could be due to correlation between risk and congestion. GL stated that the data on individual vehicle's annual mileage did not allow the identification of when vehicles were and were not used in congested situations.

Comment: noted that the accident rate differs a lot by location and particularly within urban versus rural areas, and asked whether the data suggested that heavier, longer-distance lorries generally avoid built-up areas (which tend to have high accident rates). GL said that this was a possibility but the data did not allow him to confirm.

Question: raised the issue of causality of accidents not featuring in the definition of the marginal cost of accidents. GL confirmed that in efficiency terms responsibility does not play a part because the removal of the vehicle concerned would lower accident risk, regardless of responsibility.

Question: asked why the external costs of accidents per vehicle kilometre are said to be high for HGVs, whilst the result of this analysis is a low estimate. GL responded that conventionally total costs were divided by total vehicle kms, so that issues of risk elasticities are ignored. The marginal costs are actually rather low.

Question: queried whether long-distance trucks might have multiple drivers, thus resulting in low accident rate elasticities. GL said that this was one possible impact.

Question: raised the issue of transferability between countries – e.g. from Sweden to France. GL felt that risk elasticities might not be directly transferable, but noted that similar elasticities have been found in the US, and that further investigation of transferability issues would be included in the Final Report.

Peter Bickel - 'Estimating environmental costs using the impact pathway approach'

Question: asked about the basis for exposure-response functions for PM and respiratory hospital admissions. PB said that these were developed based on the analysis of ambient pollution concentrations and health events.

Question: sought clarification on the scope of the noise impacts assessed. PB said that in addition to conventional inclusion of disamenity impacts health impacts of noise exposure had also been considered.

Question: asked about the basis for these noise-health exposure-response functions. PB replied that these new relationships used in the project had been developed by TNO.

Tuesday 18 September 2001, 0900-1500

Combining diverse perspectives to strengthen policy development

0900-1200 Session 3: Integrated use of transport accounts and marginal costs

Emile Quinet - 'Meeting the challenge of competing European doctrines'

Comment: noted the lack of current instruments to charge marginal social cost and the limited ability of users to understand and respond to complex price signals. These represent 2 constraints that needed to be considered in constructing viable mechanisms. EQ agreed, but identified the ability of air travellers to cope with highly differentiated ticket prices.

Comment: stated that in addition to variation between countries there were also very different pricing doctrines across modes. EQ said that his review had sought to contribute to building up such a picture across countries, and that a lot of discrepancy does exist between modes. However, it is difficult to assess the situation with accounts, and a virtue of UNITE will be to provide evidence for this analysis. We need to consider charges and subsidies. Road users often say they are overcharged - but in urban areas this is not the case. Railways are heavily subsidised and a clear view is needed of what subsidies are justified and which are there to cover deficit. There is a substantial debate on this.

Question: asked about uncertainty and how this impacted on the way in which doctrines really differed when it came to implementation. EQ felt that marginal cost pricing was often misunderstood and deliberately interpreted as leading to significant financial deficits because of an over-emphasis on increasing returns to scale. Meanwhile uncertainties over environmental cost are important.

Comment: said that he had a strong faith in the ability of people to respond to differentiated pricing policies, and that small scale, real life experiments would affirm such a belief.

Comment: that the background in different countries often determined the type of doctrines that had most credibility. In scarce capacity situations marginal cost pricing often dominated, whereas where over-capacity existed concerns generally focused on financing issues. EQ supplemented this comment with a note that long run marginal cost was often proposed as a mechanism for avoiding excessive investment situations.

Inge Mayeres for Stef Proost - 'Can economic analysis provide the central means of integrating approaches?'

Question: asked if national income measurement could help in establishing welfare measures. IM commented that concepts such as green national accounts were certainly highly relevant.

Question: whether full computable general equilibrium models were really needed before any progress could be made, for example on accidents or environmental costs. IM felt that transport modelling could be very helpful in assessing impacts in a partial equilibrium analysis framework.

Werner Rothengatter - 'Alternative viewpoints on the combined use of accounts and marginal costs'

Question: whether 2-part tariffs were always superior to a single price and queried whether equalising income distribution was an appropriate aim for transport policy. WR replied that in his view marginal cost was only a part of the theory relevant to pricing policy. The issue of incentives for total cost control was fundamental. Marginal cost as a proportion of average cost could be small, perhaps 5-10% in some circumstances for rail, so that the influence of this term in optimisation was limited. Multi-part tariffs could be superior to mc pricing plus markup, and differentiation by different user groups could readily be incorporated ('selfselective' tariffs responding to demand conditions). These types of tariff tend to evolve by themselves without intervention.

Comment: suggested that pricing based on marginal costs could give strong incentives for dynamic development of the vehicle fleet. WR disagreed for factors such as noise, where the MC is negligible in congested urban environments.

Question: asked how a multi-part tariff policy would be implemented, in relation to private firms in the transport market, and what information would decision-makers need to go ahead. WR said that the key point is to decide on the best institutional framework and that best pricing policy is a secondary issue. The state is not in a position to develop a good pricing policy as it is open to interest group pressure. There is an (undesirable) incentive for firms as soon as you say deficits will occur and will be covered by the state.

Question: asked about the role of dynamic modelling. WR felt that there is a strong need to smooth prices to take account of future capacity costs. A systems dynamics approach may help to look into such future scenarios.

Tom Howes - 'Pricing in practice: the Commission's policy and approach'

Question: queried whether the Commission would have had more success in starting from a highly complex approach and looking at departures from this, or to start simply with average cost approaches and build in more sophistication.

Question: asked whether the new emphasis on modal shift could be in conflict with marginal cost pricing. TH felt that the new modal share targets were highly aspirational and were a clear way of summarising the objectives of controlling congestion and environmental impacts.

1300-1500 Session 4: Future directions for a comprehensive, evidence-based approach to charging

Ken Small - 'A critical review of the UNITE approach, with particular reference to North American experience' (read by Tom Sansom)

No questions raised.

Gunnar Eriksson - 'How rapidly can pricing reform be promoted? A member state's perspective'

Comment: on the varied perspectives on marginal cost pricing around Europe and the contributions of several speakers emphasising imperfect competition, complexities, incentives and contract theory. He noted that constraints meant that we are certainly in a 2nd best world. GE replied that speakers had agreed there is common ground for developing knowledge of marginal costs. He was not convinced that ministers want to implement mc pricing in a strict theoretical sense. There were other things to take into account. The baseline was that mc pricing is a guide by which to pursue efficiency. Funding and cost recovery are also issues, but are not the whole story. A range of instruments is likely to be needed.

Claude Berlioz asked whether 2-part or multi-part tariffs were of interest in Sweden? GE said that the situation for rail, for example, was that marginal cost pricing with funding of any deficits from the general government budget was of immediate interest.

Catharina Sikow - 'Concluding observations from the Commission'

> **Andrea Molocchi** commented that there were many gaps on social costs in the maritime sector. For example, the impact pathway method for assessing environmental costs had rarely been applied and the environmental costs of infrastructure capacity expansion considered. CS agreed that gaps exist but that new guidelines on cost benefit analysis would help - these are being draw up.

Chris Nash - 'Concluding observations from the co-ordinator'

CN made a number of observations on the proceedings:

Firstly, it was clear that information in transport accounts was important. It would be necessary to know about total costs, when looking at issues of incentives, finance and equity.

Secondly, no-one believed in completely pure marginal cost pricing - all were arguing for a pragmatic approach. The challenges still ahead are serious. Nevertheless nothing heard here has shaken CN's belief that measurement of marginal social costs is central to developing an appropriate pricing policy. There are of course other issues to take into account. How close we might reasonably need to be to marginal cost pricing is one important research issue. CN suspected the answer depends partly on the objectives of the policy - there is some conflicting evidence here.

An empirical issue that will arise from case to case is: how important are surpluses and deficits which marginal cost price will lead to? 2-part tariffs or Ramsey pricing may be important here, along with subsidy systems which preserve incentives to use money wisely. These issues all need more research, some hopefully in UNITE.

CN was reassured that all 3 areas of UNITE are important. Further work on marginal costs, accounts and integration would be promoted in the light of the issues which have been raised.

CN thanked everyone involved in these 2 days, especially to all speakers, colleagues in the UNITE consortium, plus those not in the consortium who had contributed much to the seminar. Thanks were also owed to the audience who have contributed to discussion, to our hosts Emile, Dominique and their team at ENPC for organisation and hospitality.

It would be very important to us to know what the delegates had thought of the conference, so delegates were urged to complete and return the questionnaires provided.

Record of the discussion authored by John Nellthorp, Tom Sansom and Julie Whitham.