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*Implementing Reform in Transport
Effective Use of Research on Pricing in Europe*

Special conference for NAS

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Implementing Pricing Reform in Transport – Effective Use of Research on Pricing in Europe

Deliverable Five

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Implementing Pricing Reform in Transport – Effective Use of Research on Pricing in Europe

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1. Introduction

1.1 The IMPRINT-EUROPE Thematic Network

This is the fifth report of the IMPRINT-EUROPE thematic network. It reports on the proceedings and outcomes of the fifth of a series of six seminars being held under the auspices of IMPRINT-EUROPE over a 3-year period. This fifth imprint seminar was specially aimed at the specific situation of the Newly Accession States (NAS).

The IMPRINT-EUROPE thematic network brings together researchers, professionals, policymakers and operators in order to promote the implementation of transport pricing reform based on marginal cost principles. The network encompasses both urban and inter-urban transport and all of the main passenger and freight modes. The specific objectives are:

- 1) To facilitate the exchange of experience and transfer of knowledge among scientists and practitioners in the field of pricing;
- 2) To draw together the results of previous and ongoing research in the field of pricing and to make them accessible to policy-makers, practitioners, industry and other professionals in a series of seminars and deliverables designed to assist them in developing and responding to pricing policy reform;
- 3) To identify, through critical comparative work, the prerequisites for the development of an integrated approach to implementing the European Commission's proposed pricing reforms.

1.2 Policy background

Transport pricing policy development at the European level took a major step forward in 1995 with the publication of the green paper "Towards fair and efficient pricing in transport" (CEC, 1995), which recognised the importance of pricing to reflect external costs. The policy was taken further in the white paper on "Fair payment for infrastructure use" in 1998 (CEC, 1998b). The latter put a clear case for marginal cost pricing, whilst recognising that the movement towards this target would need to be phased over a number of years, and that second best measures to achieve desired levels of cost recovery would continue to be necessary.

These Green and White papers emerged from an environment of considerable turbulence in the transport field. A range of needs at member state and European level were apparent, including the need to manage transport capacity more efficiently, to finance transport infrastructure, to improve the efficiency of the transport sector by means of institutional reform, and to remove the distortions caused by different pricing principles in different member states. The framework contained in the papers represented the Commission's endeavours to provide a comprehensive pricing principle across modes and countries that would ensure that in times of change there was an underlying scientific basis for the development of pricing in the transport market.

The most recent review of Transport Policy (CEC, 2001b) reaffirmed the commitment to more efficient pricing of transport in order to internalise externalities, and announced a framework directive on pricing aimed at setting out the principles to be followed in all modes of transport. This document also sees an important link between pricing and financing,

allowing funds raised from some sectors of the industry to be used for worthwhile projects in other sectors where the result is to reduce social costs. Furthermore, a number of mode-specific pricing policy developments have emerged over the period since the Green Paper, including the "Eurovignette" directive (CEC, 1996b), a series of policy statements and directives on rail infrastructure charging (CEC, 1996; CEC, 2001), a proposed Directive on airport charges (CEC, 1997b) and the Green Paper on seaports and maritime infrastructure (CEC, 1997a).

Despite this flurry of activity at the level of the Commission, progress on implementation of the policy has been slow. In the rail sector, where infrastructure charging is generally a new concept resulting from the separation of infrastructure from operations, a variety of approaches to charging has been taken in the different member states. On the other modes there has been relatively little progress. The result is that research has focussed increasingly on implementation issues and understanding the barriers to progress and how they may be overcome. It is in this area that this thematic network aims to make a particular contribution.

1.3 The Transport Pricing Research Programme

The European Commission has sponsored a considerable amount of research into transport pricing, feeding directly into the development of policy and enriching the academic debate throughout Europe. The Commission's Fourth Framework research programme, which ran from 1996 until 2000, included:

- Projects examining the impacts of more efficient pricing such as PETS (Institute for Transport Studies, 2000), TRENEN (Proost et al, 1998) and AFFORD (Niskanen et al, 2001);
- Projects examining acceptability issues, such as PATS (Viegas et al, 2000), PRIMA (Harsman and Wijkmark, 2000) and TRANSPRICE (Vougioukas et al, 1999); and
- Projects examining issues of cost measurement, such as ExterneE (Friedrich et al, 1998) and QUITTS (ISIS et al, 1998).

As part of the fourth Framework programme, the Concerted Action on Pricing Research Integration (CAPRI) was commissioned to facilitate the exchange of information and results from research projects dealing with the pricing of transport (Nash et al, 2000). As part of CAPRI, the Commission invited all member states to nominate two experts to serve on a committee of experts, which considered and debated syntheses of research findings. Experts from some other countries (Norway, Switzerland, USA, Hungary) and organisations (ECMT, UIC) were also invited to specific meetings.

The Commission's Fifth Framework research programme, which commenced in 1998, also includes a range of transport pricing projects. These comprise:

- PROGRESS - a demonstration project on urban transport pricing;
- CUPID - a thematic network on urban transport pricing, designed to assist and link with the demonstration sites which make up PROGRESS;
- DESIRE - a project examining the design of inter-urban transport pricing schemes for heavy goods vehicles;
- MC-ICAM - a wide-ranging project examining barriers to the implementation of more fair and efficient transport pricing and how implementation should be phased; and

- UNITE - a project to develop methodologies for measuring marginal costs of transport, and to link estimates of marginal cost with the assessment of total costs as set out in transport accounts;
- RECORDIT – a project focusing on intermodal transport: it investigates the current market conditions, develops a methodology for the real internal and external real costs and calculates them for three door-to-door European corridors.
- SPECTRUM – this project aims at developing a sound theoretical framework for defining combinations of transport instruments (economic, regulatory, physical) to be used to design transport policy strategies.

IMPRINT-EUROPE may be viewed as fulfilling a similar role in relation to the fifth Framework to that which CAPRI had for the fourth Framework. That is to facilitate exchange of information, dissemination of research findings and to promote inter-action between policy-making, stakeholder and research communities. In addition, the IMPRINT-EUROPE thematic network has a distinct focus on implementation and is seeking to develop recommendations relating to the implementation process. Therefore, it has strong links with all of the above-mentioned projects, perhaps the strongest of these links, though, are with MC-ICAM – which has the same focus as IMPRINT-EUROPE but is a research project – and CUPID – which is another thematic network but focuses on urban transport issues. The links with these projects have been established: substantive inputs have already been received from CUPID for the preparation of the second IMPRINT seminar, while the fourth IMPRINT seminar was organised in conjunction with the Final Conference of MCICAM.

More generally, the findings from CUPID and MC-ICAM will feed directly into future IMPRINT-EUROPE activities.

1.4 IMPRINT Seminars so far

The first seminar identified the main open questions for researchers, stakeholders and policy makers (Matthews and Nash, 2002). It was found that some of these issues assume a different relevance depending on the mode considered, while others should be dealt with in a more global perspective either because they are common to all modes or/and because they have to do with interactions between modes.

A dual approach was therefore adopted in the second seminar, to address both transmodal and modal issues (Ricci and fagiani, 2003). In practice, this second seminar featured a series of parallel sessions designed to deal with the specific issues related to each mode, while the introductory and concluding sessions aimed respectively at covering trans-modal and integrated transport pricing related issues, and drawing conclusions to feed into the following seminar.

The third seminar gave an overview about the European charging policy, about the methods of implementation, barriers and some examples from current pricing (Kendzia and Korver, 2003). Each transport mode was discussed in distinct sessions, and the main questions were how to learn from best practice and overcome barriers and constraints to implementation of pricing reform.

The theme of the fourth seminar was that of ‘phasing and packaging, and it again dealt with practical issues (Menaz, Matthews and Nash, 2004). The seminar was held in conjunction

with the final conference of the MC-ICAM project which gave the opportunity to present and discuss the findings of the MC-ICAM case studies, including a range of modelling exercises focused on the issues of acceptability and policy implementation.

1.5 The Fifth seminar

The fifth seminar focused on those issues specific to the Newly Associated States (NAS), which are commencing the reform of transport pricing from a quite different starting point to that of the existing member states. The intention of the seminar was to look at pricing reform in the road and rail sectors, summarising the current EU situation and examining how this related to the NAS.

After the entrance of the NAS to the European Union the principle of regulation and the operating practice of the transport pricing regimes have to be harmonized to each other in the whole extended EU area. The existing gap between the volume, the quality, the service level and the pricing and financing of transport systems in the NAS can be explained mainly by the heritage of the last forty years before the transition period in these countries. It is necessary to identify the special problems of the Central Eastern European region and very carefully consider the different steps that have already been taken in the transport sector and evaluate their social, economic and other impacts.

Comparative analysis of differences and similarities in the reform processes implemented in the last decade in the newly associated states, in order to identify the lessons emerging from each other's mistakes, can help them to find their own solutions for the common and the country specific transport pricing problems.

A total of 17 papers were presented at the seminar from leading researchers and policy makers. Each session contained on the average three presentations, controlled by either a policy maker or a researcher. At the end of each session an open discussion took place in which several comments and questions were made. These discussions were also about topics, which had been only mentioned by the speakers. Altogether, a considerable number of issues were thus addressed by the presenters and discussed by participants at large. The main areas touched within each session are listed hereafter.

The *overview session* gave introspection into the Hungarian Transport Policy, focusing on the EU accession. Overviews of policy and research - especially research within the EU framework programs - were presented, and the results of previous IMPRINT seminars were analysed.

The session about the *EU Charging Policy* was centred on the overview of infrastructure charging, and the current London Congestion charge scheme was analysed.

The *rail transport* session covered existing charging methods, and gave examples of practices in the Czech Republic, Austria, and the EU at large.

The session about *road and interurban transport* focused on adaptability, considering the example of Poland and the Czech Republic. It also analysed the possibilities to evaluate externalities, and how the new scheme can be harmonised with the present transport policy.

The *urban transport* session presented experiences of where pricing reform has been and is being undertaken, and highlighted areas where new financing is needed. A model, which can evaluate the effect of road pricing, was also presented.

The final session: *The way forward* summarised the seminar, and showed the difficulties and possible solutions for NAS countries in the field of pricing and financing. The similarities and differences between the situation in the EU and in NAS countries were analysed.

1.6 Reading guide

This report summarises the main contents of the fifth IMPRINT seminar: the papers and the outcomes of the discussion are presented according to the outline of the seminar itself, and are therefore organised in the five following sections, as follows:

- EU Charging Policy
- Rail transport
- Road and Interurban transport
- Urban transport
- Overview of NAS problems and the way forward

2. EU Charging Policy

2.1 European transport infrastructure charging policy

2.1.1 *The charging policy of the European Commission*

Christophe Deblanc from the European Commission – Directorate General for Energy and Transport, outlined in his presentation the current situation of the European transport infrastructure charging policy, the principles of the European Commission’s charging policy, the major milestones in the policy process, the current charging legislation for road, railway, aviation sector and the maritime sector, the Commission’s proposal to review the existing legislation in particular in the road sector as well as the latest proposal of the Commission for the priorities of the Trans-European Network (TEN) and its financing rules.

Currently there is a great variety in the taxation systems with different structures, levels, pricing objectives. Charges are unrelated to the real costs, there is a low level of differentiation and the society often bears the costs generated by the users. There is a lack of consistency between transport modes. In the road sector: there is a great variety of charges in the form of taxes, duties, tolls or vignettes. In the railway sector charges apply to the infrastructure use. In air and maritime sectors there are many different charges without a harmonisation or legal basis. So the current situation is not satisfactory, it is inconsistent and ineffective, and there is increased demand and new investment needs but only limited public resources are available.

The basis of the European Commission’s charging policy is the “user-pays” and “polluter-pays” principle, which means that the external costs, e.g. the costs of the infrastructure, congestion, accident and environment should be internalised. The objective of the European Commission’s charging policy is to ensure a more efficient and incentive-led infrastructure use. Major milestones in this policy process are the 1995 Green Paper “Towards fair and efficient pricing in transport”, the 1998 White Paper “Fair payment for infrastructure use” on the infrastructure charging, and the 2001 White Paper “European transport policy for 2010: time to decide”.

For the road sector the current charging legislation is the Directive 1999/62/EC on the charging of heavy goods vehicles also called “Eurovignette” directive. It sets up minimum requirements for vehicle taxation, tolls and user charges but relates only to motorways, allows great differences and does not relate to the use of the infrastructure. Some countries therefore (Germany, Austria the United kingdom) have initiated new distance-related charging schemes. Due to the inefficient use of infrastructure, the great variety of charging systems, the lack of price signals and the risk of isolated initiatives, the Commission decided in July 2003 to propose the revision of the Eurovignette directive, in order to enable that prices would more relate to costs, to enable a better use of the existing infrastructure, to ensure technical harmonisation.

Main changes proposed by Commission to the road charging legislation relate to the extension of the scope for road charging (main road network, lorries over 3,5 tonnes), addition of accident cost to infrastructure costs, offsetting the burden of a new charging system by reducing the annual vehicle tax, variation of toll rates according to vehicle types, obligation of Member States to vary the toll rates as of 2008 according to the place (environmental

sensitivity and population density) and the accident risks, as well as the application of mark-ups (maximum 25% of the averages toll) in sensitive areas for cross-financing infrastructures etc.

In the railway sector, according to the Directive 2001/14/EC on the levying of charges for the use of railway infrastructure, the common charging principle for the use of the railway infrastructures sets charges at the cost that is directly incurred. Which means that the charging principle for the railway sector is the marginal cost principle. There are exceptions to this principle, notably mark-ups are allowed to increase the level of costs recovery of railways. But inclusion of external costs (scarcity of capacity and environmental costs) is still optional.

In the aviation sector a Directive on airport charges proposed in 1997 was abandoned. Commission made a proposal for a Directive on airport noise charge in 2001 in which a common method was recommended to calculate airport noise charges. Regarding the current legislation, there is no market-based instrument to allocate capacity so far.

In the maritime sector a Green Paper was issued on seaport and maritime infrastructures in 1997 which promoted the marginal cost as a long term charging principle, but has not been followed by concrete legislative proposal so far.

It is also important to link the charging issue with the investment issues. In 2002 the Commission therefore proposed the revision of the Guidelines for the Trans European Network (TEN-T) namely the revision of the Decision 1692/1996 to include new priorities, the latest legislation and also new priority projects. A High level Group (chaired by Van Miert) was commissioned to perform the revision of guidelines and of the financial rules as a result of which 22 new priority projects have been selected out of 100 submitted projects. The priority list from Essen was updated so as to include the accessing countries' priorities as well. A sum of 600 B€ will be used until 2020 for all the Trans European Transport Network. Out of this amount it was possible to select priority projects for 220 B€. Considering the financial rules, the general rule is the co-financing the costs with the European Commission up to 10% of the total costs, but in specific cases (Galileo, cross-borders priority projects) it is possible to go up to 20-30% of the total costs.

According to the latest proposal of the Commission, it is possible to move towards a more efficient use of the existing network. Charging policy has a strong role in the infrastructure development and in building new infrastructure.

2.1.2 Discussion

It was asked as to whether the 10% of general financing for the Trans European Network to be financed by the Commission would relate to the estimated project costs of the project or to the actual costs. In response, it was stated that the 10% was a kind of ceiling all over the life of the project in which one has to take into account the European Commission's support for the studies and the support for the building works itself. The 10% rule can be checked through the financing plan of the project but only at the end of the project when it has been realised.

Secondly, clarification was sought on what was the recent infrastructure investment cost in accordance with the new proposal, and how many years would it be possible to go back concerning the recent infrastructure investments? In response, it was explained that the charging principle of the Commission's proposal remained the same, the ceiling of the

charges is the fixed infrastructure costs plus the variable infrastructure costs. The existing legislative framework does not contain how long we can go back to take into account the infrastructure expenditures, but the Commission proposed in July this year to limit the period to 15 years.

Thirdly, the question of why the Commission decided to add to the Directive the obligation to vary charges by place as from 2008 was raised, and, in particular, why was it not efficient just to allow that countries vary charges by place? It was explained that it remained a political choice to add the uncovered accident costs to the infrastructure cost. The directive proposed to move towards more differentiation to ensure efficient price signals to the users and not to move to the internalisation of all costs including fix infrastructure costs but to have a kind of compromise between the internalisation of some costs and the necessity to move towards more efficiency and more differentiations.

Finally, it was asked whether we have to expect by the time that internalisation of environmental costs becomes mandatory (2008), that there would be a similar calculation framework available as it is contained by the current proposal for the directive to estimate congestion and external costs to be internalised. In response, it was explained that there was a strong debate in the Commission on the issue to internalise and how far to internalise environmental costs. In the end the decision was not to internalise environmental costs in order to keep the level of the charges at an admissible level in the transport industry, but it was necessary to ensure that the price signal related to the environmental sensitiveness, would work. In a normal position it is clear to move to a basis of charging which fully includes external costs as it was foreseen in the 1998 White Paper. But the differentiations by congestion and environmental costs had substantial benefits in terms of encouragement to using appropriate type vehicle, to influencing the routes, the time of day, and that was a major step forward. At this stage it is not possible to answer the question whether there would be a calculation framework by the time when internalisation of environmental costs becomes mandatory, because the proposal made in July has still to be discussed between the member states and with the Parliament in order to reach an agreement. Commission proposes to take into account environmental costs to differentiation. The question is how to differentiate the sensitiveness of environmental zones. The proposed directive includes commit logy procedures and the Commission considers the issue of technical support for the differentiation.

2.2 Why reform transport prices?

2.2.1 An overview of European transport infrastructure charging policy and research

Chris Nash, of the Institute for Transport Studies in the UK, described in his presentation the development of the Commission's policy on transport pricing, the research into the principles of transport pricing and the criticisms of the approach the Commission has adopted.

The EU Green Paper "Towards fair and efficient pricing in transport" (CEC, 1995) Was a major step forward in the development of the Commissions policy, and was followed by many pricing research projects. The White Paper on "Fair payment for infrastructure use" (CEC, 1998) further clarified the policy and put forward a detailed phasing of reforms. The White Paper on Transport Policy (CEC, 2001) reiterated this policy and promised a framework directive, which would cover all modes of transport, though this appears now to have been shelved. The Directive on rail infrastructure charges (2001/14) is a model of applying the

marginal social cost pricing principle in practice. The latest proposal on the charging of heavy goods vehicles (amending Directive 1999/62/EC) has disappointed many people because it does not seem to go as far towards implementing the policy as the rail directive. It certainly proposes much more differentiation of prices according to marginal social costs, but it still ties the average charge to average costs.

In principle, the most efficient pricing policy is to price according to marginal social cost, whereby the additional costs (environmental costs, social costs, infrastructure costs) imposed on society by transport users are paid by those users. If prices were set higher than marginal social cost people would not travel even though they were prepared to pay according to the costs they would impose, where as if prices were set lower than marginal social cost travellers would not pay all the costs they impose on the society. In practice, marginal social costs of infrastructure use fall into three groups:

- Costs of additional use imposed on the infrastructure provider (additional maintenance and renewal costs,
- Marginal costs imposed on other infrastructure users (cost of congestions, accidents and costs of the scarcity of capacity,
- Costs imposed outside the transport system (environmental costs, air pollution, noise, global warming and accidents).

Professor Werner Rothengatter has highlighted 7 areas where the assumptions to marginal cost pricing do not hold in the real world.

- a) The measurement of marginal costs is complex.
- b) The approach ignores equity. It means that using marginal cost pricing rich countries sending a lot of traffic through the neighbouring country may benefit and poorer neighbouring transit countries without compensation may lose.
- c) The approach ignores dynamic effects. Common prices actually may influence future investment decisions and future technological choices.
- d) Finance is ignored. For rail, marginal cost pricing will not cover the costs of providing a system and certainly not provide for the costs of investments.
- e) Institutional issues are ignored. No private company will choose marginal cost pricing. Efficient prices are needed to attract the private sector.
- f) Price distortions elsewhere in the economy are ignored. Prices in transport may just make things worse in land use or in the employment market.
- g) Administrative costs. Sometimes it is just not worth the costs of implementing complex pricing systems.

Currently, in road transport vehicle owners pay an annual fix sum plus fuel tax. With the exception of some cities, urban roads remain unpriced, whilst some countries have supplementary tolls on motorways or require purchase of a vignette. Overall, charges in road transport do not closely reflect marginal social costs. More recently, some countries use, or have announced plans to use, distance based tolls (Switzerland, Germany and the UK), which is a step in the right direction. In the railway sector the progress seems to be faster as the directive is already in place. And rail infrastructure managers have had to develop pricing systems.

Research into marginal cost pricing suggests that in congested urban areas it typically would reduce car traffic by 10-20% (Oslo, Singapore, London). A great number of case studies of

marginal cost pricing have been undertaken and show diverse results (PETS models). The reason is that circumstances are different in different places throughout the EU, for example in terms of travel patterns, taxes and subsidies.

Research into implementation issues regarding roads has concluded with the result that there is a need to consider a policy package, to consider how revenues should be spent and to adopt a phased approach to implementation.

For rail the implementation issues are, in some respects, easier, though marginal social cost is well below average costs and results in the need to either find funds to cover financial deficits or to introduce mark-ups on the charges. There is also a problem of measuring congestion and scarcity costs.

The Commission was always aware of the complexity of the pricing issue. In practice, the rail Directive is a very good example as it takes the marginal social cost as its base for pricing, but it allows for problems and exceptions.

The proposed road directive allows differentiation according to environmental and congestion costs, and takes the average infrastructure and external accident costs as its base.

In conclusion, it was suggested that what has actually happened in transport policy is broadly consistent with the 1998 White Paper, though timescales have slipped and implementation remains a crucial issue.

2.2.2 Comments

A reference was made to the difference between short term and long term marginal social costs and the consequent level of charges. Short run marginal cost may offset the congestion and environmental effects, whilst long run marginal social cost pricing gives better investment incentives because infrastructure managers can only charge the capital cost if they actually do make investment. In terms of the actual level of charges it is not possible to say, in general, whether prices based on short run marginal cost will be higher or lower than those based on long run marginal cost. Where there is a shortage of capacity, long run marginal cost pricing will lead to a lower charge, where there is a surplus of capacity, it would lead to a higher charge.

The audience was requested to evaluate, how the current or proposed EU legislation framework matches with the transport policy requirements of the accessing countries and what kind of barriers they could see in the implementation of such charging principles.

- Due to the different levels, problems and possibilities of the accession countries and EU member states, it was suggested that “converging transport policy”, rather than “common transport policy” would express better the sense of the tasks to be done.
- The problems of the priority of sustainability or other coinciding priority issues of Poland due to the different situations and priorities which may be more important in the accessing countries than sustainable transport, were outlined. It was also mentioned that when they were calculating marginal social costs in Poland, they had faced the same problems as have been highlighted by Rothengatter: equity, transformation, financing of infrastructure.

- A brief support for colleagues from Slovenia and Hungary was given concerning the problem of the implementation of the pricing system in the accessing countries and in those countries that will access later such as Serbia. It was mentioned that these countries should introduce more simple and efficient schemes and should move only later step-by-step to more sophisticated calculations and schemes.

2.3 European transport infrastructure charging policy in practice

2.3.1 Road Pricing in London

‘How much will it cost to stop traffic congestion?’ asked Mark Valleley, of the Association of London Government, in his presentation. The answer was: £5, that is 2000 HUF or 7 Euros, as this is the amount of the Congestion Charge being levied on vehicles moving within central London between 7am and 6.30 pm on weekdays.

London clearly had a congestion problem and people living there accepted that something needed to be done. 7 million people living in London, have to face the challenge that London is growing to 8 million by 2015, 3 million cars are owned and approximately 50% of journeys are undertaken by car. Central London is the most congested area of the city. 1.1 million people enter the area every weekday, 84% of them are travelling by public transport. Traffic speeds before the introduction of the congestion charging scheme were approximately 15 kph, the traffic was spending 50% of time in queues.

The structure of the Government in London had a major bearing on how the scheme was introduced. The National Government set the legislative and the policy context. The Mayor of London who is independent of the National Government made the final decision. The Transport for London organisation (TfL) was responsible to introduce this scheme. The Association of London Government (ALG) represents the interest of the 33 district councils and serves as an interface between them, the Transport for London and the Mayor.

Prior to the introduction of the scheme an independent so called ROCOL study published in 2002 concluded that the congestion charging scheme based on a £5 per day charge for vehicles entering the central area, was practical, enforceable and deliverable in a short time scale and the introduction of this charge would have a significant impact on the traffic congestion. The introduction of the scheme covers quite a small area of London.

Drivers can pay the £5 charge at retailer outlets, by post or phone or over the Internet. In advance or on the day of travel by paying the £5 charge drivers are assigned a registration number and entered into a database maintained by TfL. Cameras positioned on periphery of the congestion charging zone monitor the traffic and the automatic number plate recognition system which takes a colour contextual image of the vehicle recognises the number plates of cars and checks on registrations database the payment of the charge. In a case of non-payment of charge until 12 o'clock at night on the day of the travel, the driver will get a £80 penalty charge notice by post. But in the case of paying this within 14 days, penalty will be reduced to 40 £. As a result of strong debates buses, taxis, disabled drivers and electric vehicles are exempted from the charge, and residents living inside the zone are entitled to a 90% discount.

For monitoring the scheme's impacts on traffic, travel behaviour, society, business and the environment, Transport for London (TfL) has initiated a five year £7 million monitoring program. The Association of London Government (ALG) was also asked by politicians to do an independent, though smaller scale, monitoring study.

Results of monitoring the traffic, flowing into the congestion charging area on 16 high-flow inbound gateway sites during the charging hours (07.00-18.30) immediately before and after the scheme was introduced, showed that the traffic has reduced by 20% after the introduction of the congestion charging scheme. Further monitoring has revealed that it was not the case - as it was expected - that everyone stopped going into central London in the first few weeks only to start returning later.

Regarding the daily time periods and peaks, there has been no increase (or a very slight increase) in traffic in the pm peak hours. As a consequence 15% of people are either not travelling or undertaking journeys around the congestion charging zone, 25% of them switch to other modes like taxis, motorcycles, and the majority, 60% have transferred to public transport.

Start-up costs of the scheme were £180 million (257m Euros), and it costs £97m (138m Euros) a year to run the scheme. The gross revenue from the fines, penalty charges is expected to be £165m (235m Euros) and the net revenue, net surplus £68m (97m Euros). So, the scheme on the base-to-base figures would pay for itself within two and a half years.

In the future, possibly by 2006, the Mayor is proposing to extend the scheme to a larger area. But in the existent ANPR technology it is not possible, so first a new technological solution must be found.

As a conclusion it is provable that the Road pricing in London is operating successfully. People accepted the fact that there was a problem and that something needed to be done about it. Uncertainties concerning the impacts of the charging scheme are to be clarified in particular in the respect of the business impacts. Concerning the charging technology, ANPR technology, as it stands, cannot be extended any longer within London, so establishment of another system is needed.

2.3.2 Discussion

It was highlighted that the tax in London will lead to a net increase in revenue, and that 60% of people have moved to public transport. Given these facts, the question was raised as to what the revenue was being spent on and whether, in part, it would be used to fund public transport expansion.

The presenter responded that additional buses were provided in the run up to the congestion charging scheme and that bus patronage has been increasing quite significantly since 2001. There are clear limits on what the Congestion Charge revenue can be used for. The revenue must go back to finance the transport system.

A further question was raised as to how many new jobs have been created by the scheme in London, if such figures are available? The presenter responded to say that monitoring is going on to evaluate this issue, but that it is obviously a complicated issue, and that there won't be any results specifically on these impacts until next April at the earliest.

3. Rail transport

The third and fourth sessions were on rail transport. There were three presentations, followed by a round table discussion.

3.1 Railway reform, infrastructure charging systems

3.1.1 Rail Infrastructure Charging in the EU15 and Switzerland

This presentation was given by Benedikt Peter (Technical University of Berlin, Germany). The paper analyzes the requirements for rail infrastructure charging, laid down in Directive 2001/14/EC, which calls for marginal cost pricing and allows for mark-ups.

Infrastructure pricing is a long established and controversial issue of European transport politics. The different approaches of the EC reflect the heterogeneity of opinions across the member states, within the scientific community and among practitioners. The general claim of directive 2001/14/EC is establishing of marginal cost pricing. But deviations are allowed in the form of mark-ups on these costs.

In nearly all the European countries the infrastructure is in public ownership. The legislation of the EC refuses to require a specific organisational structure and ownership of the infrastructure manager (IM). However, some conditions concerning open access, price setting and slot allocation procedures have been laid down, but leave plenty of freedom for the national governments and the respective IMs.

The paper describes a general form of the cost components of rail infrastructure. The **cost function** can be described as follows: $C(\mathbf{z}, \mathbf{q}, \mathbf{v}) = F_1(\mathbf{z}) + F_2(\mathbf{z}, \mathbf{v}) + c(\mathbf{z}, \mathbf{q}, \mathbf{v})$.

The function is based on the assumption, that the costs are additively separable. C denotes the total costs, F_1 the block wise variable costs, F_2 the common fixed costs and c the variable costs. The proportions of F_1 and F_2 change over time. The difficulties of charging systems result from allocating the common costs and the block wise variable costs to the operators, as their nature prevents them from being distributed in an impartial way. Thus, the costs of the slot provision depend not only on the traffic volume (q), but also on the characteristics of the infrastructure (z) and the superstructure (v).

The paper introduces and analyzes the four standard pricing principles, such as Short Run Marginal Cost (SRMC) Pricing, Ramsey-Pricing, Fully-Distributed Cost (FDC) Pricing and Non-linear Tariffs and their suitability for track charging. It concludes whether the requirements of Directive 2001/14/EC match the features of the “best standard pricing principle”.

- SRMC-pricing gains static allocative efficiency, but fails in a dynamic perspective and generates a deficit.
- Ramsey-pricing reaches static allocative efficiency only under the constraint of deficit covering. It provides not more (dis)investment incentives than SRMC-pricing.
- The form of FDC-pricing reaches allocative efficiency neither in static nor in dynamic perspective, but it ensures total cost coverage.

- Multi-part tariffs for intermediate goods can be designed to cover the total costs. The different parts of the tariffs can be designed to reach dynamic allocative efficiency, only considering the market for intermediate goods. It is likely to lead to a welfare loss on the final consumer market.

A pricing system has to be adapted to the specific situation of the IMs. It is very likely to be an adjusted mixture of all these principles.

The paper also analyzes track charges across the European Union in the light of the suggestions of the economic theory and the requirements of Directive 2001/14/EC. It is found that not all of the tariff systems of the EU member states accomplish this directive. The directive states that the charges have to be set at the level of the direct costs of the train run (i.e. the marginal costs).

- *SRMC-pricing* is applied in Sweden, Finland and the Netherlands. The Swedish and Finish tariff systems are based on detailed cost studies for the wear and tear components, deriving the marginal costs from the total cost function.
- *Linear tariffs* are in Austria, Belgium, Denmark, Portugal, Switzerland and Germany, where the prices are not only cost-based. This leads to a part closure of the gap between the income of the IM and its costs.
- *Non-linear tariffs* are in Italy, Spain, Luxembourg, United Kingdom and France, where the price per unit changes with the volume of traffic. Two-part tariff systems are likely to have negative welfare effects on the end consumer markets and they seem not to accomplish directive 2001/14/EC.

The establishing and publishing of a tariff system in most of the scrutinised countries have to be emphasised as a positive development. A network statement already often accompanies it, as it is required by directive 2001/14/EC. It contains the conditions of infrastructure access. All infrastructure charging systems are – in varying degrees - linked to the physical utilisation of the tracks. Price levels and structure of services differ significantly.

As a conclusion the paper advocates a form of Ramsey-pricing although there are information problems and a welfare loss from a static perspective compared to a plain marginal cost scheme. The analysis of the four standard pricing systems shows that no pricing system is in any case Pareto-superior. Multi-part tariffs are ruled out, because they seem not to be accepted by the directive 2001/14/EC. None of the tariff systems are able to solve capacity problems. This is done by the priority rules for slot allocation during the timetabling and during operations. As long as infrastructure prices are not able to account for scarcity, pricing is of limited relevance for the capacity allocation and investment decisions.

3.1.2 Some Information Aspects of Railway Infrastructure Charging in the Czech Republic

This presentation was given by Robert Číhal of the Czech Railway Infrastructure Administration. The paper introduces the main organizational, economic and information aspects of railway infrastructure charging in the Czech Republic in connection with EC harmonization directives and international co-operation in the framework of the EU. The main focus was on universal principles for information system's and their automated (software) support.

In the Czech Republic a great reorganization of all railway transport, operation and managing conditions is in progress. The operation of the Czech Railways generally harmonizes with the EC directives 2001/12 and 14 from 1st January this year on the following fields:

- *State Organization (ČD s.o.)* operation of railway transport (passenger and freight transport), railway infrastructure and other business activities.
- *Railway Route Administration (SŽDC s.o.)* ensures the railway network functionality of public interest and bears the costs of modernizing and developing the railway lines.. Major areas of activities: performing the duties of the owner with respect to the railway route, exercise of the management right to the railway route operation, functionality, modernization and development, management of assets that constitute the railway lines, administration of payables and receivables discharged from former ČD (SŽDC) collecting fees from individual train operating companies using the railway lines

In the Czech Republic 10 rural routes totalling 168 km have been leased out by ČD for private operation. Every railway line entrepreneur or transport operator, including ČD has to be licensed by the Railway Authority.

The liberalisation of the train path market and the new railway undertakings require a new system of infrastructure charging supported by existing Adjustment of the price assessment, issued by the Ministry of Finance. It is determined to be used on the intrastate railway infrastructure of national and regional railways.

For using the intrastate railway infrastructure of the national and regional railways the following computational formula is applied:

$$C_m = S_1 \times b \times L + \frac{Q}{1000} \times S_2 \times [L - L_e(1 - e^p)] \quad \text{where}$$

- C_m means a price for using the intrastate railway infrastructure of national or regional railways by one train for an agreed route
- S_1 means a price for 1 train km as a share of the price for operating the infrastructure (operations control)
- b means a coefficient taking into account the weight of trains in infrastructure operation
- Q means the gross weight of a train in tons, taken for
 - *a freight train*: railway rolling stock and the loaded goods' weight (consignments)
 - *a passenger train*: railway rolling stock weights and passenger's weight,
- S_2 means a price for 1000 ton kilometres (tkm) for a particular type of train as a share of the price for ensuring the infrastructure operability for 1000 gross tkms
- L means the distance of trains running in kilometres, rounded up to whole kilometres
- e means a coefficient taking into account active motive power units of independent traction on electrified lines
- L_e means the distance covered on an electrified line by a motive power unit of an independent traction
- p means the number of motive power units referring to the coefficient e relating to the number of active motive power units

In the everyday management practis inspection has many connections with the information system (IS). This system is automated and contains several subsystems. While the main processes are usually on-line and real-time connected, a special IS needs to be built

combining both database and graphical railway description with marketing information about important features of stations and tracks and with calculation or billing processes. Many functions of that type are executed by the new organizational unit type, by the so-called One-Stop-Shops (OSS). Therefore this unit probably has to be the main user of the new IS based on Internet technology and operated in close connection with other subsystems of the railway administrators (or undertakings).

The paper also underlines the role of the European Infrastructure Charging Information System (EICIS) where beside ČD many European infrastructure managers, including DB Netz, MÁV, ÖBB, PKP, Railned, RFI, SBB, SNCB and ŽSR take part in focusing on OSS functions and giving them automated support.

The EICIS database is divided into two main parts managed by a General Manager (main project parameters) and national Data Managers. Many algorithms are used for network and train description, including calculation formula, using many parameters, entered by Data Managers. Therefore, it is possible to change the charge calculation conditions any time and in a wide data spectrum. Information needed for the infrastructure charging and OSS as the main user is comprehensive and they integrate both operational and constructional points of view.

Individual European states and their railway administrations have various experiences in these reform processes. And IS automated support is very important. However, these systems are very conservative and their rebuilding is very expensive. But the international character of the traffic, business and communication demands mean that extensive standardization and unification of all information processes is needed. Therefore information aspects of the railway infrastructure charging system need attention not only from the operational or economic point of view, but from the information one too.

3.1.3 Infrastructure Charging at the Austrian Federal Railways. Transit Traffic, Railway Connection along the Transport Corridors

This presentation was given by Klaus Garstenauer of the Austrian Federal Railway, Österreichische Bundesbahnen (ÖBB). The paper comprehensively presents the infrastructure charging system applied by ÖBB and introduces service packages for train operators.

ÖBB is an integrated railway undertaking. The Infrastructure and the Transport Operations divisions draw up separate balance sheets and separate profit and loss-accounts. Infrastructure is basically financed by the federal budget as far as operations and maintenance are concerned. Currently, investments are financed by a company, which acts as a “special purpose vehicle” to fund railway infrastructure investments.

Access to the ÖBB-network is possible for third-party operators as of 2001. There are six domestic and three foreign train operators providing services on ÖBB's tracks both in freight and passenger traffic in addition to the ÖBB-trains. Ten licenses were issued by the ministry and 12 safety-certificates were issued so far by ÖBB-Infrastructure. The share of traffic-volume operated by the new entrants is still small though.

The main product of ÖBB-Infrastructure is rail capacity, represented by the train-path specified in a timetable. Train-paths are available for a one-year timetable period or for

shorter periods. Spare capacity can be allocated to customers even within hours for urgent needs. There are priority rules for the allocation of capacities in the timetable based on the respective provisions in the Railway Act. A general priority is mandated for traffic in the public interest, i.e. commuter trains ordered and funded by public authorities. Regularly running trains have priority over trains ordered at short notice. Trains which cover a longer distance have priority over trains covering a shorter distance.

ÖBB-Infrastructure offers four service-packages for train operators:

- **Minimum access package:** in line with the minimum access package by Directive 2001/14/EK. The price charged is still based on *train-km* (line categories) and *gross-ton-km* (*marginal costs*). Mark-ups on marginal-cost-prices are allowed.
- **Shunting Personnel Service:** formation and reformation of trains in marshalling yards and bringing wagons to the destined place for loading, unloading, cleaning, repair etc. after they arrived with a train.
- **Access to passenger stations:** Prices are differentiated according to station category and type of a train. The passenger trains are differentiated as express, semi-fast and local ones.
- **Stabling:** an additional service-package for the parking of rail-vehicles. Fee is charged per vehicle and day are stabled.

In order to assess the future development of its market-segments, ÖBB-Infrastructure is going to monitor the most important independent variables for the development of its business and to estimate the influence on key sales-figures for the infrastructure. ÖBB-Infrastructure has identified four major pillars of success: customer-friendliness, flexibility, confidentiality and non-discrimination.

The treatment of the essential functions of the infrastructure-manager, like timetabling; calculation and setting of prices for infrastructure-services; and issuing of safety certificates to train operators as laid down in Directives 2001/12/EC and 2001/14/EC, may not be fulfilled within any integrated railway undertaking, because there is no efficient solution for the separation of the responsibility for capacity-allocation and resource-allocation.

The paper underlined the need for international co-ordination in the infrastructure business and highlighted CENTROPA-group, which unites the infrastructure-managers of the newly associated states: Poland, the Czech Republic, Slovakia, Hungary, Slovenia, Croatia and Austria. Regardless of the organisational status and of the membership-status in RailNetEurope (RNE), this group aims to develop the international business together.

3.2 Round Table Discussion

Following the presentations there was a round table discussion in the first part of which the speakers were asked about their presentations. In the second part they were interviewed on the up-to-date problems of NAS countries.

3.2.1 Financing the rail infrastructure

In response to questions, it was elaborated that in Austria 25-30% of ÖBB's income derives from infrastructure charges and the rest comes from the government budget. If not from the government, then the infrastructure managers are allowed to take out loans with government guarantee.

It was further explained that chapter 2 of the Austrian Federal Railway Act sets down how the infrastructure of ÖBB has to be financed. In certain areas of operations, maintenance and investments there is a specific agreement over a period of five years which determines what money might be used for. For financing the infrastructure of small state-owned infrastructure providers there is special legislation.

3.2.2 Infrastructure charges

A question was raised regarding the scarcity factor in the Austrian infrastructure charging framework, and whether it was designed to affect demand or simply to raise revenue. In response, it was explained that it is both a means of raising revenue from particular segments and eliminating, to some extent, bottlenecks by diverting traffic to off-peak hours. The effects of this scarcity factor have not so far been significant, but this system only started on 1st January 2003 in segments of bottlenecks.

It was asked as to whether users could seek compensation for being delivered an inappropriate level of service, given that when they pay infrastructure charges they expect a certain quality of service to be provided. In response, it was suggested that it is necessary to make a quality regulation for the infrastructure managers and that an incentive regime, such as exists in the UK, might be useful. Under such a regime, an agreement is established between operator and infrastructure manager whereby financial rewards and penalties are payable according to whether performance exceeds or falls short of predefined benchmarks. ÖBB will be testing a new regime for passenger express trains in Austria next year.

Ideas were sought on how infrastructure managers might avoid being accused of discrimination. In Austria it was explained that short-term requests in timetables and train paths are treated in a non-discriminatory way - should they be the request of new entrants, small railway undertakings or incumbents – because the same numbers of people are employed for dealing with short-term requests and for the annual timetable.

The legality of new entrants and smaller undertakings paying, under a two-part tariff regime, only variable costs (and, hence, them not having to pay a contribution to fixed costs) was queried on the grounds of it being discrimination from the point of view of the dominant operator. It was explained that pricing policy requires two sorts of information: on marginal costs of different types of traffic, and on how much revenue the infrastructure managers have to raise from the users. It was asserted that the two-part tariff system is a very efficient system in combination with franchising, as you can apply a two-part tariff system under which all franchisees make an equivalent contribution to fixed costs. Within this, it is advisable to let new small operators pay only the variable part of the tariff; any advantage this might defer on new entrants is likely to be counter-balanced by the inherent advantages enjoyed by big incumbent operators. However, there is a problem if the small new entrant operators grow and start to damage the incumbents so there is a need to be pragmatic.

3.2.3 Up-to-date problems of NAS-countries

Information requirements – in NAS countries there is a certain need of setting up the structure, to obtain the necessary information, experts set up the sensible rail infrastructure charging scheme. Accession countries need to know how to transfer the knowledge, and how to create a good system.

The first important question raised was regarding how NAS might go about calculating infrastructure charges, and in particular how they might get the appropriate data for such calculations. It was explained that most of Central-European railways do not have exact current and historic data on costs of operation. It was suggested that the best way is to start with a simple division of fixed and variable costs based on experience and research in other countries and that more sophisticated approaches could be developed further in the medium to long term.

The issue of mutual communication in order to help each other through, for example, PHARE projects, twinning projects and seminars, was raised. It was noted that the presence of an expert from a railway company who can help in developing information systems was extremely useful.

The example of infrastructure charging in Romania was raised. The Romanian Railways apply infrastructure charges since 1998. There are 7 categories of line, which makes the system very complicated but the informatics system (IRIS), is still being developed. With IRIS though, the full system of infrastructure charging will hopefully be ready in approximately 2 years.

After seeing the above mentioned examples, it was highlighted that the main problem for NAS countries is identifying the right way forward. The European framework is rather open, providing a basic structure with a lot of modules to be used by member states according to their specific needs. It is now up to all member states to see how well the first attempts lead to a beneficial charging regime.

There is no best solution so far, because the solutions mainly depend on how the infrastructure managers are financed. In many accession countries a clear framework defining how the infrastructure should be developed, and what this means for financing, is missing and this acts as an impediment to setting up infrastructure-charging schemes. . Furthermore, the infrastructure managers must know the costs (fixed and variable), and have an idea of what the market can bear, before then deciding on their product portfolio. And in all of this it is a huge task to keep up the information systems. In the end, the European Commission advice was to base the prices on Social Marginal Cost and charge what the market can bear.

4. Road and interurban transport

4.1 Interurban road pricing in EU

In this session three papers were presented, the first was an overview on Interurban Road Pricing by Wim Korver, the next was about implementing pricing policies in interurban road transport in NAS countries in the light of present transport policy – the example of Poland by Monika Bak and thirdly the participants heard about the experience of the Czech Republic from Stanislav Kutaček and Hana Foltýnová.

4.1.1 Overview on interurban road pricing

This paper, which was presented by Wim Korver, was based on a number of European research projects and on the experience gained in the Netherlands. The presentation discussed the general meaning of interurban transport, the reason why Interurban Road Pricing should be implemented, and the three key aspects of economics, technology and acceptance.

Whilst the definition of interurban transport is not actually entirely clear, it generally refers to trips between urban and local areas longer than 15 km. In the passenger sector 80% of car km falls into this category and the percentage in freight transport is even higher. In the future the share of interurban transport is expected to increase even further.

Interurban Road Pricing is helpful in raising revenue to finance new infrastructure, for which only limited public funds are available, and in the formation of a fair and efficient pricing system. Marginal social cost pricing is proposed as it generates fair competition among transport modes and because it maximises the social surplus, i.e. the sum of the producers' surplus (=the profits of the private and public transport enterprises) and the consumers' surplus. The implementation of marginal social cost pricing enables the internalisation of all external costs and resolves the problems of congestion and demand growth.

Currently, tolling differs in different countries. Tolloed motorways have a long tradition in EU countries; for example France and Portugal, but only a short tradition in most non-EU countries; This said, Switzerland was the first country in Europe where an IRP was implemented to charge infrastructure and environmental cost on the whole national road network. Hungary was amongst the first countries in Central Europe to finance a motorway project through tolls immediately after political change. Austria, Germany and the Netherlands all have charging proposals at various advanced stages of development. Denmark, Finland, Norway and Sweden have the common approach to implement both environmental motor fuel taxation and Eurovignette. Norway also has a long-standing tradition in electronic pricing.

National decisions concerning IRP are strongly determined by financial needs. In countries where HGV (Heavy Goods Vehicle) charges are levied (either manually or automatically) so as to cover infrastructure costs and internalise environmental costs, surplus revenue will be generated, except in regions with low traffic volumes.

The economic perspective is based on the work of MC ICAM, which has found that first best pricing is not, in practise, feasible at present. Second best pricing options have tried to answer a number of different questions: what is the difference between charging for passenger transport and freight transport, road transport and non-road transport and differentiation and

non-differentiation. In general four implementation paths have been evaluated focusing on freight transport: the “do nothing” alternative, the best optimum: full social marginal cost pricing. The “do nothing” alternative for freight in the case of the Netherlands shows that the volume of transport will increase and assumes technological improvement leading to HGVs having less noise and less environmental damage. If we compare freight transport with passenger transport, the increase is even higher.

The alternative implementation forms do not show much difference in transport performance, but the welfare effect is positive for all implementation paths in the long term. Welfare is highly dependent on the way revenues are used, and on the assumptions concerning labour market and consumer behaviour. The optimal congestion charge for freight is lower when passenger transport is also charged.

In Europe the trend in technology is to change toll systems into electronic pricing systems and such systems have been implemented successfully in Norway, London and Switzerland and a system for Germany is under construction. Technological difficulties however may appear. It takes time to produce the on-board units and to equip all vehicles. The private sector will not pay for all costs in a combined road pricing system. Only road pricing is not enough to cover costs of the board unit, garage, mobile communication, billing, CRM and marketing, administration etc.

interurban road pricing has been faced with a lot of opposition. When a system is implemented there is always an alternative available (Public Transport, another road). That could result in the fact that revenues are directly invested in the same area (to provide better public transport or new road infrastructure) The problem must be clarified in order to allow the public to understand the nature of it: it can be a congestion problem or a quality of life problem.

The economic optimum sometimes differs from the real world optimum. In EU member countries the main focus is on freight transport but from the economic point of view passenger transport should also be included. Charging only interurban road traffic has a major impact on welfare levels that vary strongly per country due to the diverse existing levels of charging, and different charging systems. The technological aspects cannot be underestimated.

4.1.2 Discussion

It was suggested that it would be useful to lower labour taxes in order to have a positive effect on transport. The presenter responded that if the transport network is good, it would be useful to lower labour taxes, and that there were findings from MC-ICAM which provided evidence for this.

It was asked whether we need to have an urban road pricing scheme before introducing interurban schemes? In response, the presenter said that from the technological perspective it is better to start with small cases and to then try to allow the system to grow. However, in some cases, eg the case of the Netherlands, where problems are bigger outside urban areas than within them, it makes more sense to start with interurban road pricing.

4.2 Case studies on road pricing policies in NAS-countries

4.2.1 Implementing pricing policies in interurban and road transport in NAS countries in the light of present transport policy - the example of Poland

The presentation, GIVEN by Monika Bak, answers the following questions:

- What have been the major changes in road transport in NAS during transformation?
- How has the historical background (socialism) influenced the implementation of pricing policies in NAS?
- What kind of changes have to occur during transformation in order to implement pricing systems in transport?
- How have transport policies in NAS changed during transformation?
- What are the barriers TO implementing pricing systems and how might they be overcome?

There are specific approaches and constraints on implementing pricing policies in NAS which are similar to the ones among EU countries. Both economic growth and transformation promote the development of road transport and reduce the movement to other modes. The major reason for this is that liberalisation in road transport is much easier than in other transport modes and beside this road transport grows quickly.

Both quantitative and qualitative changes have taken place in the evolution of interurban road transport in NAS during transformation. Quantitative change was for example the growth of road freight carriages, and the boom of private motorization has resulted in an increased external cost concerning transport. This was the negative impact. Qualitative change was the general improvement of transport services, and the modernisation of the transport fleet resulted in the total cost of transport being decreased. Low rate of investment into the transport infrastructure has influenced the increase of external costs of road transport in the transition countries. The problem of external costs of road transport seems to be a very important reason for transport policy makers having to deal with the problem of changing pricing policies in these countries.

The next general changes to have taken place in road transport during transformation were technical changes like modernisation of rolling-stock, structural changes like growth of mobility of people, and changes in modal split of transport.

Regarding Poland, changes in volume of passenger cars as well as the trends in transport volume in passenger and freight sector have changed. Within 12 years of transformation, from 1990 to 2002, total number of cars doubled from 5 to above 11 million. Analysis of passenger transport by rail and buses (excluding urban transport) proves a decreasing trend of public transport. In 2002 the volume was at the level of 40 % of the total number of passengers in 1990. Then both the number of passenger km in road transport and the number of passengers have decreased. The number of passengers (and passenger km) in interurban bus transport exceeds the number of passengers carried by rail. There was a boom in private motorization. The growth of society's mobility has been realised mainly by passenger cars. This trend causes an increase in the infrastructure burden, which was generated also by changes in the range of freight transport. In rail transport a 50% decrease was pointed out. in comparison with the data from 1990. In road transport, number of tonnes first decreased, but then it has kept the level of 200 million tonnes constantly. The number of tkm almost doubled between

1990 and 2002 (from 40 to 75 billion tkm). The predominance of the mass merchandises among transported goods by rail is clear, but the number of tkm in road transport is considerably higher than in rail transport (75 and 48 billion tkm).

The socialist economy required central planning in the form of command and quota system, which consisted of the central determining process and the distribution of tasks and resources in quota from the administrative centre to enterprises. Macroeconomic priorities in socialism were the development of heavy industry, especially metallurgy, power-machine sector and the energy industry. Such priority had some influences on the development of the transport sector, and of course within that rail transport. The command and quota system, however resulted in a lack of financial resources for infrastructure investments and environmental protection.

In the socialist system prices did not perform a functioning characteristic for market economy because they were fixed by the state administration. The purposes of the tariff policy in transport in centrally planned economy were: collecting resources for the state budget, having an impact on the localisation of the production, stimulating export, supporting anti-import production, improving the balance of payments, and co-ordinating transport tariffs with the general policy of the country.

In order to implement new pricing systems in transport and make them effective, changes were necessary (the theoretical model of which was derived by Monika Bak). The model is based on the concept of the economic order and new institutional economics. These countries have a change from central planned economy to market economy. Economic transformation consists of three major groups of problem. They are: changes of behavioural patterns for example law, changes of tradition and informal patterns and changing the system of decision-making, organisational changes in enterprises, in the state, in international organisations, in local authorities and in non-governmental organisations. Some effects of transformation, are positive and some of them are negative for example in the case of social effects the growth of unemployment is one of the negative effects of the transformation processes.

In NAS countries the removal of the old tariff system and the introduction of the new legal order are necessary: The expected barriers are a lack of good practical examples, the incompatibility of the old and new regulations and social acceptability problems. The system of decision-making must be changed too. Constraints to be expected are: confusion of state institutions, blocking efficient decision making in new economic conditions, limitation of enterprises' decision making in new pricing systems. Concerning the changes within organisations, we have to settle fair and comprehensible pricing policy in transport. The state is responsible for sustainable development; calculation of external costs and internalisation policies. The barrier is the economic crisis and crisis of public financing during transformation. Enterprises must clear the rules of competition on the free market. Constraints are threats of excessive fiscal charges. In the case of international institutions the important change is the settlement of the assumptions of the pricing policy in transport at an international level; mainly it is the role of the EU, and also the unification of national regulations. Constraints are the approaches concerning pricing in transport at the national level and application of different, sometimes contradictory instruments. In the case of local and regional authorities the major change is the increased competence of these authorities after decentralisation in NAS countries. So the necessary changes form a possibility for creating a real transport policy including pricing on local level and policy of environment protection, calculation of external cost of transport, instruments of internalisation. The constraint is that revenues can be more important than other purposes of pricing policy in

transport. In the case of non-governmental organisation pro-ecological activity assisting the reforms in pricing policy in transport can be expected as necessary changes and the barrier is that these organisations are not so important in these countries, so low political acceptance and low effectiveness characterise their activities.

We can identify three factors, from the range of different internal and external factors influencing transformation of pricing policies, as being most important:

- The political factor - which seems to be important for pricing reforms, as it determines the political willingness to change the pricing system and reduce external costs of transport.
- The Economic factor – which seems to be important because considerations in reforming the pricing system in transport purposes which are different from those heading only for achieving budget revenues.
- The integration processes within Europe - which indicate a pressure on the adjustment in the pricing system in transport to be harmonised with the EU rules.

If pricing policies are implemented, the effects of transformation can change. The impact can be the following: modernisation of the fleet, technical improvements, more rationalisation of modal structure of transport, competition in transport markets, more efficiency of transport activity, reduction of external costs of transport and better living standard.

Monika Bak has analysed the transport policy in different transition countries and she analyzes the changes of the Polish transport policy from the point of view of pricing in transport. The first transport policy in Poland was introduced in 1995, and the newest one is valid from this year.

She identified the problem of the calculation of costs and internalisation in the NAS. These countries have information problems and so they have different/incompatible systems for collecting data, problems with infrastructure cost evidence and methodological problems with cost calculation. The next two problems are in connection with the internalisation policy. These are the political and social acceptance of internalisation and insufficient results of studies on internalisation policies.

The barriers to implementing pricing policies in NAS can be summarised as follows:

- Lack of information – insufficient data on costs and of cost calculation;
- mentality and social acceptance;
- transitional ideological chaos;
- transitional chaos in transport policy;
- financial resources – high costs of advanced technical instruments of transport pricing.

Taking into consideration the barriers to implementing a new pricing system in transport in the NAS, it can be noted that overcoming them requires some general steps and achievements:

- Completion of transformation process – enabling resolution of organisational problems, change social mentality, achieve acceptance,

- High economic growth – enabling cost calculation, financing expensive technical solutions, dispel fears of fiscal burden,
- Good examples from the EU – enabling easier adjustment to known practical solutions in enlarged Europe, necessary to progress EU policy in this subject.

Summing up, only after realising some general economic aims, one can expect barriers to implementation of pricing policies to reduce. This does not mean that in a few years there will be no constraints on a new pricing policy, but only that they can be analysed at the same level as in the EU countries.

4.2.2 Discussion

The presenter was asked whether they thought that the NAS countries had to have some transport problems, most particularly problems of congestion, before they try to introduce pricing systems, and whether such problems would mean that acceptance of pricing would be greater. She responded to say that in Poland there have been problems, and they have had congestion, and there is still a problem with the social and political acceptance and with radical solutions to the problems. Perhaps, she suggested, they have to wait for good examples and experiences from elsewhere and then social and political acceptance will be available.

A further question was raised as to whether the problems were of the new economics markets in general or only problems apparent in the transport sector? In response, it was reinforced again that the problem of the new economics market is a general problem because when a system can be changed, the expectation is that the free market will be employed, and liberalism in general is very popular in the NAS countries. In some cases people do not expect big intervention from the state in the economy policy, though there is a very big intervention in these countries. The state institutions are apparently confused in such cases.

4.2.3 Externalities in the transport sector and its internalisation. The case study of the Czech Republic

Stanislav Kutaček presented the state of the art situation of external cost calculation in the Czech Republic. External costs in general relate closely to the conditions of pricing policies. So far, only external costs of accidents are taken into account but there are also external costs of an environmental nature. Two main methods are the cost-based and a damage cost method for evaluating environmental degradation

The most deeply analysed externality in the transport sector in the Czech Republic – currently under examination by TRC and CUEC institutions – is related to air pollution. The method is based on marginal cost and the adapted Uniform World Model. Results of emission modelling designed by the Transport Research Centre (TRC) were taken as the basis for calculation of external costs due to air pollution. The total external costs of emissions related air pollution were calculated as being 25 billion CZK (approximately 806 million EUR). Average costs of road traffic (per 1000 person km) are as follows:

cars 86 CZK (2,77 EUR)/1000 pkm);
 buses 311 CZK (10,03 EUR)/1000 pkm); and
 heavy goods vehicles 276,9 CZK (8,93 EUR)/1000 tkm.

The differentiation between cars and buses is big perhaps because the buses are in very bad condition. The external costs of other transport modes (aviation and inland shipping) in the

Czech Republic are negligible in total numbers. However the costs are quite high in relative terms. They can analyse the contribution of each of the 14 regions to the entire amount of external costs in transport sector caused by air pollution in the Czech Republic. There is a big differentiation between the pollution of the regions (from 2 to 13 %).

They have calculations of external cost of road accidents, by vehicle type too, and calculations of external cost of green house gases, of traffic noise etc. In case of noise they have used only the recommendation of the European resources (0,3 % of the GDP).

Hana Foltynova gave some information about the ExterneE Project founded by the European Commission DG Research in 1991. ExterneE means External Costs of Energy and it calculates the external costs of transport. There are two methodologies: the impact pathway analysis and the Uniform World Model. Their research uses the Uniform World Model for calculating external costs of transport. They focus on three emissions: NO_x, SO₂, and PM in four transport modes: cars, buses, freight road transport, railways (motor section only). This method focuses only on the impact on human health and life, so other external impacts will not be taken into account. The Uniform World Model was originally designed for the calculation of external costs of energy production so it had to be transformed to the transport sector and adapted to the Czech conditions. First results show big differences between car external costs and public road transport external costs, which mean that car emissions or their impact on human health are much smaller than that of public transport per person km due to a big technology gap between cars and buses in the Czech Republic. The result of calculating external cost of emissions per vehicle km and external cost emissions per energy consumption are optimistic because external cost in accordance with energy conception has been increasing, but in the case of cars and road freight transport it decreased. There are some other models used in the Czech Republic too, for example the GEMIS model, where they compare two kinds of technology: petrol motors and diesel motors. The external costs of diesel vehicles are higher than by petrol vehicles.

The 2002 OECD study has some differences in comparison with the TRC and CUEC studies in the field of external costs. It is because different methodologies and different databases were used. The OECD received the highest external costs and the TRC results were the most optimistic.

The Uniform World Model calculates quite well global impacts of emissions but the local impacts should be calculated more precisely with local special model. Using the ROADpol model developed for estimation of concentration of pollution, they can predict average annual concentrations of pollution. The model needs data about linear sources of pollution, about receptors of pollution and meteorological data.

In the next step the scope of internalisation of externalities in the Czech road transport sector will be analysed. Policy recommendations for the best design of measures to internalise the relevant externalities and getting prices right in the transport sector in the Czech Republic will be discussed. Further research activities will be focused mainly on application of the ExterneE method in the Czech Republic as well as in other Visegrád countries under ExterneE-Pol EC-funded project

4.2.4 Discussion

The general question of how Poland, the Czech Republic and other NAS countries can move forward from here in the future was raised? It was mentioned that Poland has a national project for internalisation of external costs. In the project they have also a forecast taking into consideration different transport policy variants with and without some internalisation instruments. So they have some future research in their country. Furthermore, there are several studies about the future development of transport in the Czech Republic but they are not very optimistic: the number of cars will still be growing. There is a big discussion about how to influence this development They are preparing a road pricing system for freight transport and the most possible variant is that they are going to adopt the German-style system. So they are currently waiting to see how it works in Germany. At the political level the new transport policy till 2020 must be prepared. In Serbia, external costs were calculated for the first time several years ago, subsequent to which they tried to assess the effects of an active transport policy on external effects and got quite good results in terms of percentage change. Unfortunately there is a big gap between the results of the research and the awareness and the limitation of the people dealing with the policy. In summary, in those countries which are not currently accession countries there are bigger problems. The users are taxed but routes are not kept at the required level while the system is not transparent at all. The countries need to press for fundamental changes and then later to move towards efficient charging systems.

5. Urban transport

5.1 Urban road pricing in EU and Norway

5.1.1 : Urban pricing in EU member states

The presentation given by Jo Baker (Transport and Travel Research Ltd, UK) describes the state of the art on urban pricing schemes implemented in EU member states and Norway, demonstrates the results of the ProGR€SS project so far, analyzes the terms of the future and gathers relevant factors which are in connection with urban road pricing systems.

The PRoGR€SS project has been developed in response to the task on Competitive and Sustainable Growth under the European Commission's Fifth Framework Programme. The general aim of the PRoGR€SS project is to demonstrate and evaluate the effectiveness and acceptance of integrated urban transport pricing schemes to achieve transport goals and raise revenue. The presentation analyzes the urban transport policy from public and political acceptance and technological points of view and the connection of the social and transport goals with the effectiveness of these schemes.

8 cities were involved in the PRoGR€SS project. The main goal of the theoretical demonstration is to raise awareness of the potential of road pricing. GPS-based trial with volunteers was made in Copenhagen, Gothenburg, Bristol. Two area-based charging systems were tested in Copenhagen. The zone system is based on cordon charging and traditional tolling technology, the distance charging system is based on satellite positioning technology (GPS). The kilometre-charging plan is then made up with two different price levels to be tested.

Two different scenarios (congestion trajectory-based and environment trajectory) have been designed for demonstration activities in Gothenburg. Real money is used as an incentive similarly to Copenhagen. The main purpose is to evaluate effects and attitudes but it will not lead to an implementation.

The Bristol demonstration fulfils the tasks for Vehicle Positioning Systems in the context of a national lorry-charging scheme and a local city centre charging scheme. Three charging methods (distance charging, cordon charging and virtual gantries) are examined. An Automatic Number Plate Recognition (ANPR) system will be used.

In Rome the main objective is to reduce the number of vehicles accessing the so called Limited Traffic Zone and to promote public transport through the adoption of a fully integrated public transport fare system. The real city centre charging scheme has been introduced in work hours and it is being demonstrated in the evenings. Throughout the entire project there will be a continuous information interchange with citizens and representative associations.

In Edinburgh the City Council believes that a considerably higher level of funding will be available through the introduction of congestion charging. It then becomes realistic to introduce different technologies, pedestrian and cycle route improvements, significant public transportation (rail and bus) service developments. In addition it will continue to undertake extensive consultation and public participation to ensure that residents and businesses support

the concept. The Council has also given the commitment to city residents that a referendum will be held prior to making any final decision on the introduction of congestion charging.

Cordon pricing is going to be tested in Genoa. The technology applied in the Genoa demonstration is based on the ANPR system (no in-vehicle equipment is required). The cameras are able to detect up to 2,000 vehicles per hour per lane. The demonstration will be a full real pricing scheme with real charging and real users.

EC policy gives clear guidance on urban pricing. Relevant questions are the subsidiarity issues, the issue of interoperability and the electronic fee collection (EFC). At the moment we need to have simple proven technologies because of the higher cost of GPS-based technology. It might happen that solutions of technologies must be replaced within the next 5-10 years, because there is a major cost implication. In urban areas cost recovery is not really an issue, but the environmental and social impact of traffic obviously matter. The terms of the urban pricing schemes are different in Europe. Short-term urban pricing schemes are employed in the UK, Italy and some parts of Sweden, while the inter-urban scheme effectively controls the access to some Dutch cities.

What are the lessons learnt? Political commitment, very strong communication and awareness of citizens are all needed to the successful introduction of urban pricing systems. Besides, clear strategy, aim, consultation and trial with volunteers to promote acceptability of pricing are also very important factors therefore we have to find a positive, personal story and publish it in newspapers and to talk clearly about the importance of public health. The pricing system must be equitable, rational and accountable. It must provide transparency and fairness (it must handle exemptions, and allow for consistent and effective enforcement).

5.1.2 Comments

The EU is optimistic about NAS and initiatives are being developed on urban pricing, as well as on more ambitiously radical reforms of the transport system. There are a lot of NAS cities involved, some of which are seriously looking at introducing pricing systems.

A politician from Bucharest has been invited to speak about pricing, but it turned out that no politician would get involved in a discussion like that. The scheme is looked at from the professional level, rather than from the policy making level.

The situation in Stockholm, where there is going to be a referendum once the proposed pricing scheme has been introduced to decide whether to keep it or not, was highlighted with some concern. It was felt that there was a danger that the scheme might be rejected - not because it was not a good scheme, but because something had been imposed on people before they had actually been asked and they had not had the opportunity to comment on it.

There had been a presentation on this subject at the previous IMPRINT seminar where we had learned that the political candidate who took over power in Stockholm gave, prior to their election, absolute assurance that no road user charging scheme would be introduced. Following the election, in order to build a majority and develop a power base, various political agreements were made, leading to the commitment to the electorate on not introducing road user charging in Stockholm being broken. Now there is commitment to introduce the scheme at the start of 2005, to run it for a year then have a referendum afterwards to see what the results were.

It is an interesting point that it is very unlikely to get full support for the scheme in advance of implementation. It is established that after implementation, acceptance tends to improve. Once people get used to the scheme, it becomes part of the urban fabric, and they are less likely to object.

It was also asked whether it was possible to avoid bad news stories in the media. In response, it was emphasised that it was important to have a very strong media-handling strategy. In London a lot of effort was spent on how to handle the media and how the story of road pricing was sold in different stages in the developments of the scheme. The bad news cannot be avoided. Particular groups of people that are clearly disadvantaged could create a big story in the media, and if so, then it needs to be addressed. On the other hand, it is advisable to rely on professional advice on how to deal with the media. In London the mayor dealt with the question of road pricing in different ways at different phases. Saying nothing to the media is a bad strategy, because the media will immediately think of the worst. The key is professional media-handling and being proactive.

5.1.3 Norway's toll rings: Full scale implementations of urban pricing

The paper presented by Terje Tretvik (SINTEF, Norway) discusses various toll systems in Norwegian cities. A total number of 36 toll projects (interurban and urban) are in operation in Norway in 2003.

Norway has a long history of financing sections of road infrastructure, especially bridges and tunnels in inter-urban areas, by combining road user tolls and public funds. This tradition was for the first time introduced to urban areas by the launching of the Bergen cordon-pricing scheme in 1986. The other two large Norwegian cities subsequently followed the example set by Bergen, and introduced urban pricing schemes, Oslo in 1990 and Trondheim in 1991.

Several cities in Norway have discussed road pricing, and some have decided on specific local systems: Tromsø implemented a local petrol fee in 1990, and in Kristiansand an "amputated" toll ring with only two toll stations was started in 1992. This was expanded to a complete ring in 2000, when three more stations were added.

Since 2001 Stavanger, the fourth largest city in Norway, has been part of a regional road-pricing scheme including the neighbouring city Sandnes and surrounding local municipalities. The system includes 21 payment stations, and charges are differentiated by time of day. Noteworthy, this happened after a planning period of 15 years. In the accepted investment package, only 37% of the revenues are to be allocated to road investments.

The contents of the city investment packages and the design of the schemes have changed in line with local political preferences and developments in technology. The sole emphasis on highway investments in the Bergen package widened to include infrastructure investments for public transport, cyclists and pedestrians in the Oslo and Trondheim schemes. The Stavanger scheme, and new plans for Bergen and Oslo, may indicate a new era of packages in the larger cities, characterised by public transport predominance. However, even smaller cities and towns in Norway, seriously contemplate the idea of transport investment packages, part financed by urban tolls.

The urban toll rings in Norway are based on local initiatives, approved by local and regional political bodies and sanctioned by the National Parliament. They are managed and operated by private companies with limited responsibility, owned jointly by municipal and county authorities.

The stories of the Norwegian toll rings have shown that it was possible to successfully implement crude forms of urban road pricing, even if opinion polls indicated that a majority of the constituencies were opposed to the schemes. In all the cities, public support improved after implementation. The reason why support increased is that each of the urban toll rings was linked to a well-defined package of transportation infrastructure improvements in the urban area, and that real improvements were visible shortly before or shortly after the introduction of pricing.

The impacts on traffic of the toll rings have been small, since the toll fees have generally been low and the primary objective of the designs has been fund raising rather than congestion pricing. The Trondheim scheme, with its time-differentiated charging system, did however show substantial shifts in timing for some car trips.

5.1.4 Discussion

It was asked whether the Norwegian cities referred to have parking fees or not? In response, it was highlighted that the cities have ordinary systems as an addition for parking.

It was further highlighted that the charge level in Oslo was too low to make a difference to the level of car traffic. However, for Oslo there have been studies undertaken by the institute of transport economics showing that it would create a net benefit if the present system were changed to a congestion charging system that has 2x-3x the level of charge and it is put into operation only for the morning and afternoon peak. However, the political decision system has not reached this advanced stage yet.

5.2 Possible models for urban pricing and financing of public transport in NAS-countries

5.2.1 Harmonisation of the Public Transportation of Slovenia with the EU: A Need for New Financing and Organisation Solutions

The paper presented by Stanislav Bozicnik (University of Maribor, Slovenia) discusses the public transport policy in the EU, describes the current public transportation system in Slovenia and analyzes the possible model for financing and organising of public transport.

After the accession of Slovenia to the EU in 2004 cross border passenger transport will start to grow in importance, because of the economic-social integration of the cross border regions and centres. This fact will consequently require qualitatively and quantitatively coordinated and harmonised public transportation services on both sides of the existing borders. Similar positive trends within public transportation are to be expected also with the neighbouring Hungary.

There are three different layers of organisation of public transport services in the EU. General objectives of public transport policy are determined at strategic level. Products, services and

their tariffs and qualities are defined at tactical level. The operation of network and cost control has happened at operational level.

Three basic types of contracts are in existence between the organising authority and the operator in the EU. Remuneration is not related to the profits, but on other results in a management contract. The annual remuneration consists of fixed and variable sum. Remuneration is based on the costs/expenditures and the risk on the commercial revenues is shared in gross cost contract. The remuneration consists of revenues and fixed compensation, industrial and commercial risks are borne by operator in net cost contract.

There is currently no general law in Slovenia for uniform regulation of public transportation in the country. There are separate acts, decrees that regulate public transportation of various modes: rail, road, air and sea (shipping). The basic characteristics of the present system of public passenger traffic and its financing in Slovenia are the following: line ticket system (each ticket is valid separately for a definite drive line and for a particular carrier); settling out the concession for the urban public transportation: public tender for a limited period of time (usually ten years); public passenger transport provided by the Slovenian railways (within Slovenia) is defined as an element of public welfare (the state is obliged by law to provide low cost public transport services); public passenger transport in shipping traffic is being carried out in accordance with market conditions based on an agreement with the competent community; public air passenger transport is being carried out under market conditions based on the licence of the air carrier acquired by the competent state agency.

In Slovenia there is no uniform approach and process to public transportation financing. So in this case, various models of financing are valid at the moment for various types of public transportation: inner railway passenger transport (prices are controlled and compensated by the state from the state budget, there is no charge for the use of infrastructure); international railway and bus public passenger transport (free market conditions); inner inter-urban public bus transport (from the 1st of September 2001 the registered public transport companies receive subvention from the state on registered lines); urban public passenger transport (prices according to the concession contract).

The essence of a possible new model of public transport is to combine basic advantages of regulated and deregulated models of public transportation in the field of organizing and financing of PT. Free competition (market) conditions and decreasing of the role of state must be applied **as far as possible** to ensure the intervention of the state **as far as necessary**. There is no final political decision on the strategic concept of the public transportation system in Slovenia. The most suitable solution is based on domestic experiences and the best practice in the EU taking into consideration the specific Slovenian aims, possibilities and conditions.

The backbone elements of the new public transportation system must be determined at tactical level. The relevant components of it are: uniform tariff and zone system, harmonisation of activities between urban and inter-urban bus transport and railway public passenger services. It is very important to define the methodology of the usage of the public funds.

A suitable information system is required to represent the basis for analysing the volume and dynamism of passenger flows on individual lines and which would be the basis for business decision-making.

The central computer system calculates the level of cost-coverage by revenues from sold tickets. The cost of transport is set individually for each particular transport company. The technical requirements for functioning of the system have to be provided. The transport company (ies) coordinates the transport services directly with service users according to their requests. The market-oriented approach can be applied in the self-financing lines. Concerning non self-financing lines the authorities are obliged to cover the difference that has appeared out of the uncovered part of the costs. In this case the volume of the remuneration should be fixed and contractually agreed upon for the whole concession period on the basis of one-year practical experiences (also based on analytical data that are made possible by the information system mentioned above).

This way the transport company would become a partner to the (local) authorities. The increased revenues belong to the transport company as a reward for its improved services, while the decreased revenues would remain the business risk of the operator.

The different public transportation systems have to be harmonised in cross border regions, the advantages of regulated and deregulated systems have to be combined and the transparency of financial flows has to be provided with up-to-date information technology.

5.2.2 Discussion

The question was raised as to what would happen if the contractors went bankrupt and decided to move the services – in particular would there be compensation? In response, it was explained that the remuneration level was defined according to the experiences between year 1 and 2. It is registered in the information system, so rough 2-year information is provided about the income and the revenues on the lines which are met of the contractual relationship mentioned. That remuneration is the result of the 2 years experience. Normally if the public transportation provider is operating better and getting closer to the timetable to the needs of the population and having the right tact of the transportation services, then, as in the example of “Wirtsburg”, the revenue might be increased by 50% and the increase of the passengers might reach 25%. Remuneration should be fixed according to experiences and according to realistic expectations and possibilities. Certain EU systems - which are based on the similar way - have been checked, and it appears that this system is much better, than the budget system.

The difference between the costs and revenues should be covered, but the problem is how to cover them. It was suggested that the difference should be financed by public funds. The problem from the practical level is how to assess the volume of the public funds and how to distribute them. The Slovenian solution at the moment is to develop more sophisticated information systems and use them for controlling the need or demands for higher remuneration from the states.

5.2.3 Modelling the impacts of road pricing in Budapest

The paper presented by János Monigl (Transman Ltd., Hungary) discusses the main characteristics of the current transport situation in Budapest the scenarios developed helping with the TRANSURS model system and the main findings..

The road and public transport network in Budapest are principally determined by the specified geographical location of the Hungarian capital city. The city is divided into two parts by

Danube River. Since there are seven bridges for road traffic inside the boundaries the urban road traffic concentrations in the inner – narrow space – part of the city is pretty high. On 2.1% of the area of Budapest concentrates 7.4% of the traffic, 12.0% of time consumption, 9.7% of fuel consumption and 6.4% of air pollution. Currently the three underground lines are not able to solve the congestion problems.

The local modal split is 60:40 (public transport:car) but the rate is increasing year by year to the advantage of cars. The commuter traffic into the inner part of the city by car is around 68%.

The connection between the car trips by household car ownership and destination area was determined with models and methods based on the data of the 1994 household survey. The ratio of the car traffic is higher than 60% in city trips and 80% in Danube crossing trips. The tendency has been continuously worsening because of the increasing motorization. The performance of Budapest Transport Limited (BKV) decreased by 20%, and crossings over Danube increased by 65% in the last decade.

In spite of the changed transport policy the financing issues on BKV has not been solved. The latest Transport System Development Plan covers the goals of reducing demand for transport in order to mitigate the critical environmental (air, noise and congestion) impacts, effective land use management, restructuring traffic organisation and management for cost efficient operation.

The road pricing system must fulfil all the requirements mentioned above. The EUROPRICE Energy efficiency of Urban ROad PRicing Investigation in Capitals of Europe) project, finished in 1999, carried out the theoretical method for charging experiments and the model calculations for Budapest. Furthermore, this project tried to analyse effects of road pricing measures to the energy saving. For the modelling work the TRANSURS model system – developed by TRANSMAN – was used. Within the project framework the TRANSURS model was developed to apply simultaneous models based on logit-models, because models with trip-end or trip interchange mode choice do not deliver realistic results for destination choice and mode choice.

Three measure- and a reference scenarios were modelled to investigate the impact of the various measures. Scenario 1 was about applying Danube Crossing Toll system, scenario 2 concentrated on Inner City Tolling including scenario 1 measures as well, while scenario 3 – Pest Side tolling – has added further measures to scenario 2 on Pest side.

The investigated scenarios were evaluated against reference scenario on the base of various calculated indicators, e.g. time, energy (fuel consumption), air pollutions, noise levels and accidents. From the inner city point of view Scenario 2 gave the best results. It would decrease the departing and arriving traffic in the direction to the inner areas overall by approximately 4%, while the proportion of the transport modes would change as follows: private cars -40%, public transport +8%, bicycles +3%, pedestrians +2%. Compared to the base scenario the different modes in the inner districts of Budapest as well as in the whole city would change as follows: destination traffic of private cars (-42/-4%) traffic performance (-48/0%), time spent in the traffic (-65/+1%), fuel used (-54/-1%) emitted nitrogen-oxide (NO_x) (-31/+3%) – decrease (-), increase (+).

The elaborated modelling task showed that TRANSURS model could trace the impact of such measures with an adequate accuracy. The results proved that such pricing measures generate advantageous traffic and environment impacts locally but one should take care on global effects as well. The road pricing measure generates substantial additional fare box revenue; this would be HUF 7 billion/year (1995 prices) in Scenario 2. It must be emphasised that the pricing measures should be used only in the case when all other, conventional traffic management measures has been considered or tried and in the outer area complementary traffic network development measures, e.g. alternative route or mode development, are also applied.

5.2.4 Discussion

The question of how the charges are calculated and decided upon, in particular in the case of the charging scenario that gives rise to annual revenue that equals the annual deficit of the public transport company, was raised. In response, it was explained that toll or fees have no relation to the cost. In Budapest a possible level of access fees were considered. Some comparisons were given (e.g. Parking fees which were 60 HUF.) For one crossing, 100HUF to 200HUF was calculated, but it has to be taken into consideration that at that time 1 litre of petrol was also 100 HUF. At the same time from the average salary in Hungary 400 litres of petrol could have been bought, whilst from the average salary in the EU countries 4000 litres of petrol could have been bought.

It was highlighted that whilst all the problems are considered and thought about in depth, a common transport policy could only be implemented with great difficulties. A common direction should be agreed, but unfortunately “arrival at the end point” will not be at the same time for all countries.

6. Conclusions

6.1 Overview of problems and ways forward

Katalin Tánczos (BUTE, Hungary) sought to summarise the seminar's presentations and discussions, and provide an overview of NAS problems and possible ways forward.

First she summarised the objectives of the NAS specific IMPRINT Seminar, followed by a short overview of the general characteristics of the NAS countries and a comparison of the transport policies of the NAS, highlighting the mode specific differentials.

To help identify ways forward, first of all the necessary conditions for implementing good pricing reform, as declared by the European Commission, should be identified. It was very clearly pointed out by previous speakers that one of the most important issues is to improve the information systems of these countries regarding the transport sector. It is also very important to create a more coherent revenue and cost accounting system in order to help answer questions such as how much revenue will charging raise, what percentage of costs will be covered, what types of cost have to be covered from these revenues and, more generally, how should revenues and costs be allocated? Furthermore, more cooperative and harmonised strategy is necessary for implementing pricing reform but it is difficult to define the necessary steps to create this harmonised and cooperative strategy.

In the member countries there is, due to their market economy tradition, a relatively widespread understanding of what it means to use prices to convey market signals. The motivation for this seminar was, however, based on recognition that those who lived for half of their active life in a commanded (COMECON) regime, without much international contact, need some explanation in this field. In particular, the theoretical background is not easy to understand given that these countries have missed much of the market economy background. Therefore the main objectives were clearly identified as being to assess the current situation of transport infrastructure pricing and financing regimes in the NAS countries.

Monika Bak's paper elaborates the transferring process from a COMECON to a market based regime, which helps people not living in this environment to understand more about the difficulties arising in connection with these very significant social and economic changes. Knowledge of how these countries have made this transition makes it easier to understand what to do in the future. Naturally very closed to these original objectives the theoretical knowledge on infrastructure charging must be disseminated for providing better understanding of the problems.

Professionals in the NAS knew about these new results but before the transition period started it was not obligatory to teach this type of elementary knowledge and therefore both the average citizens and more highly educated people knew almost nothing about externalities and related issues. To evaluate transport externalities is a key objective, necessary because it provides the possibility for a partial and gradual internalisation of those externalities. There are already some significant trials on this field and partial results in monetary values but looking at the different backgrounds or methods or institutions that made the calculations, the values are sometimes doubled or even tripled within the same field and the level of uncertainty is huge and very difficult for a politician or decision maker to explain. In time estimates will become more and more precise but it takes time to find the right database and

to apply the right methodology. Therefore it is again a long process, e.g. the Hungarian scientific reviews were already published in the late 1990's, but whilst not everyone was getting the information from these sources, they have to accept the tolls and charges.

Sharing practical experiences of the adaptation of different theoretical streams, recognising their advantages and disadvantages, was a very important aim of the Seminar. The member countries already have a lot of good experience in this field, which have to be learned, not re-invented, and adapted for the local environment. That involves a mutual learning process, to know more about the NAS specificities and to learn from the member countries' experiences.

The common principles for the implementation of an agreed, phased pricing reform must be identified. A u-turn and/or a shock in the field would be detrimental because transport must always be workable; it cannot be stopped if the day to day activity would be influenced it can make a very negative social impact on the local society. Therefore an agreed step by step approach is necessary, with compromises being made where appropriate.

Last but not least the gap between the member countries and the new comers must be decreased. The aim of the extension of the European Union is, among other things, to improve the synergy of the integration of the infrastructure system and the transport infrastructure system.

Some general characteristics of the NAS countries can be easily identified. In almost every context the GDP per capita, even taking into consideration the domestic purchasing power, is significantly lower than in the member states. The standard deviation of this indicator is very high, which means it is not enough to know for all decision-making. There are also big differentials in market size, regarding the area size and the number and concentration of population. These vary by locality and again in some respects result from the last forty years during which time this very centralised hierarchical structure of the population distribution was supported. The geopolitical position of the countries is also very different. Some of them are really central whilst others are peripheral to the whole European context. The physical geography of the countries is also very different: some countries being hilly and others very flat. In some respects these countries are more competitors with one another than equally interested cooperative stakeholders in the same issues.

Progress in the different NAS countries has been very variable during the last fifteen years of transition. The transformation from a commanded to a market driven economy is very serious and completion of this process is developing differently in these countries, and is further from completion in the remaining group of NAS countries. A number of problems are anticipated, including the restructuring of the demand side, wholesale changes in industrial activity and dramatic change in the foreign capital's influence on local activity.

Hungary is viewed as being one of the pioneers amongst the NAS countries. The Hungarians are, therefore, already in certain respects suffering from the recognition of these problems. Regarding its transport, Hungary has some familiar mode split trends, with railway usage decreasing and road increasing, but more dominant environmentally friendly modes than in member countries at present; though it should be noted that this is expected to decrease in the next few years. Furthermore, in the commanded regime the development of transport infrastructure was financed only from the rest of the budget, which lead to transport infrastructure being under-developed. These facts have to be considered in relation to any decision on pricing reform.

Comparing the transport policies of these countries, the announced objectives are very similar and in line with the European Commission White Paper. The key words are everywhere the same as EU integration, legal harmonisation, safety and environmental considerations, efficient and market oriented transport regulations. However, while all countries' governments are repeating these words, there is no clear long-term strategy for funding and very late budget reforms which make it difficult to gain a transparent picture of the costs of different fields.

Considering mode specific issues, firstly for rail, different countries are at very different stages of the railway restructuring process and, hence, arrive at different results. The restructuring process has speeded up and then slowed down many times. Governments have, from time to time, promised to speed up the reform, but it is then postponed because of serious financial situations. There are well known theoretical solutions of how to proceed but there is not the available money to really take these serious, difficult steps. Consequently, the problem is that they have not yet a really flexible new organisational structure that is ready to operate among the already changed market environment.

A transparent, good detailed accounting system was previously not the requirement on these NAS countries. It was mentioned that there are fluctuating managements and conceptions, not to have the perfect way to go on. That is not help for an effective change and fitting the conditions to the requirements of the European Union in the NAS countries.

There is no clear vision for the desired size of the railway network. It is acknowledged that there is an oversized network due to performance previously not being market driven, but there is not yet the political leadership in this area. This is not an easy question though, because there are a lot of social consequences and there are no brave, independent politicians who have a clear view on the specific subject and who have the brave supporters to allow them to take what might be unpopular decisions

There is not enough knowledge of the state-of-the-art in the implementation of rail charging schemes. Higher education helps to disseminate this knowledge, but young professionals in the industry are not well-received as the acceptability of the knowledge is very low, and the elder professionals often do not understand such words as marginal social cost based pricing. The result is that there are huge organisations with a lot of not really continuously trained people, a point which is not always considered in the European Commission's perspectives.

Different concepts for charging schemes and their development currently exist in the different countries. Therefore the information technology system, which is a very hard tool to provide, is not supporting the necessary decision-making.

Given the geo-political situation of some of the NAS countries, competition along the transit routes are stimulating people more to get a short run revenue than to have a good long-term solution.

There are different strategies and experiences in financing motorway development. For instance, Hungary was a real pioneer in this field, starting the transition period with a very bad world-first position; the Hungarian citizens had the highest debt service/capita in the world when the country had these possibilities to change the world around itself. The budget was empty, the performance was going down, the private or public-private financing was

started immediately and there was an attempt to get a lot of investors but there was not a clear strategy, which assessed the long term effects of the processes¹. The consequences for the local population were very bad. The domestic road (motorway) users had bad experiences on the expensive tolls they had to pay, the local inhabitants of the cities along the motorways suffered from the heavy track traffic avoiding the tolled sections and crossing the settlements. The media created a negative image of the newly constructed road infrastructure.

The bad message is that in all the NAS countries dominantly the vignette system is available at the moment instead of more advanced solutions. Hopefully, these steps are introduced only temporally and the main direction remains the km-based charge, but because of the short term political interest a gradual introduction of the user pays principle is prioritised

Acceptability of road user charges is very low considering the concerned public participants, there is no professional communication to users, which is even in the market oriented member countries is a key issue.

A professional marketing, well structured public relation package of messages to the whole community is a missing element of the strategy.

What is specified for the urban pricing and public transport-financing field?

Different roles of state and local municipalities exist in financing urban transport developments and operators.

There is a great variety of adaptation of the contracted systems. The difference between the costs and the revenues of the public transportation system should be covered; here the state plays the most important role. The government has to contribute at least to the development of local transport but sometimes only the local municipality is providing the money.

There are excellent publications in this field; some ECMT publications include the NAS situation as well.

What is the way forward?

The universal "best solution" does not exist. Local interest and development of the transition must be carefully studied and good adaptation is the task for finding our own solutions.

Transport infrastructure, roads and railways must meet at the border, therefore the neighbouring countries have to adopt some co-operative infrastructure charging strategies with emphasis on phasing, to provide interoperability in time and in place and not to implement the system ten years earlier or a few years later. The neighbours must agree on these issues.

The construction of the basic transport network is better if it is based on the shared state budget, including European Union funding. In this system the users must at a minimum cover the operational, maintenance and internalised externality costs. Those costs, which are

¹ In January 2004, because of the strong public pressure, the state bought out 40% of the shares of the M5 motorway concession company, AKA, to get the right to extend the vignette system to this road as well. The shadow price of the use is paid by the tax payers.

quantifiable and transparent, can be charged without the payers believing that it is an extra tax on transport use.

Step-by-step progress is necessary. That means: first a simple, then a gradually more complex and differentiated charging system is the solution. In the long horizon, paying for transport infrastructure service packages chosen by the users is the solution. With completion of transformation process, solving the organisational and institutional reforms, changing the social mentality to achieve acceptance, considering the high economic growth of these countries and improving cost calculation, technical developments and enforcing easier adjustment to identify practical solutions in the enlarged EU can solve the pricing related policy problems.

The main problems of NAS countries to be solved are, how to influence the changes of behavioural patterns, which takes much more time than simply executing the regulatory changes. The following topics are relevant to solve these NAS specific problems: necessary conditions for implementing pricing reform, improving information systems, more coherent revenue raising and cooperative, harmonised strategies for implementing pricing reform.

All the differences must be considered, but the approach is similar and NAS countries can learn from other countries. Conditions for implementation of pricing reforms are the following: adopt clear definition of the pricing methods, collect information about the real costs, including the most important externalities, reliable and standardised technologies, declaration and acceptance of common and mandatory pricing policy. At the moment there are expected barriers for implementing pricing policies: e.g. unclear statements of the EU and lack of good practical examples, incompatibility of the former and the new regulations even in different sectors. We have to analyse the possible impacts and what kind of decisions must be made, after evaluating them.

A key question is the improvement of the information systems. There is a need for more convergence in standardised information technologies. The information gathering processes of different countries have to consider the minimum requirement of EUROSTAT for data collection regarding to quality and investments. All of the neighbours of Hungary have their different conception concerning the implementation of charging and technical solution of information. Hungary has very low level public information about the different modes of transport. More research work is necessary to analyse the functional connection between quality and cost, especially local calculations were needed concerning the local behaviour and willingness to pay.

Healthier, better work distribution between transport modes is necessary. It should be considered, that always the better solution should be applied, road or rail, respecting that more cooperation is necessary, of course by providing the required level of services. A good combination of co-ordination and competition is needed.

For the implementation of the pricing reform, there is a lack of harmonised strategy and a common view of the future between the countries in the neighbourhood, which is necessary because of the similar situation of them. A clear and determined declaration for phasing of the implementation approach towards NAS is needed, like in the member states. It means firstly in the Visegrad 4 countries (Poland, Czech Republic, Slovakia and Hungary) and Slovenia, then the second group of the associated countries. Key issues are also enforcement and common understanding of term “non-discriminatory”.

Problems are also corruption and poor software, which must be included into the legal framework, and discrimination among the operators in a country. These problems are not, however, confined to NAS countries.

6.2 Conclusions and recommendations

The key issues are grouped as follows: institutional reform, finance and acceptability.

The institutional question is, how to implement the pricing policy, with a mixture of central government, local government, railway, which is getting independent from government control, private sector transport operators, PPP operations. Who is responsible for what and how to make decisions, which is a very serious problem, especially in public transport.

Regarding finance it is not possible in Hungary to charge the users for the construction of the highway, because the users are not rich enough and the policy is not acceptable. Charges are possible for renewals, maintenance and operation, but not for externalities and construction. Experts guess that prices are too low but there is not very much research. In transit traffic, the taxpayers are paying for the infrastructure cost, and transit traffic doesn't contribute.

Acceptability is the third issue. In Hungary there is a wide acceptance for paying for financing purposes, because it is understood that finance is needed. There is a lack of acceptance for the polluter pays principle and for demand management.

Some persons believe that organisations in NAS countries are not yet good in communicating with users and the general public, about the reasons for what they are doing and selling them their ideas. Several speakers had said before that communication is very important in raising acceptability, so perhaps this is the priority area for attention in the NAS countries.

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