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Acknowledgement and foreword

We are indebted to the expert group members who gave their time willingly to present papers and contribute to discussions. Whilst this report is an outcome of the meetings of the group the opinions and conclusions expressed within are those of the authors, particularly section 6.2 which was written after the programme of meetings had completed at the request of the EC. The conclusions and opinions cannot therefore be taken to represent those of each expert group member, their organisation or the European Commission.

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Executive Summary

The European Commission's 2001 Transport White Paper (CEC, 2001) identified the major transport policy challenges of the time to include an imbalance of demand between modes, congestion and environmental impact. Key aspects of the Commission's policy since 2001 have therefore been to review the pricing of transport services with the aim of adopting social marginal cost prices (though this has since been adjusted to the adoption of 'smart' charges (CEC, 2006a)) and increased investment in the Trans-European Transport Network (TEN-T). The full cost of the 30 TEN priority projects is estimated to be approximately €340 billion (2006 prices). However, despite this proposed expenditure and the additional proposals for investment in national transport systems the level of investment in transport infrastructure has fallen in all Member States and now amounts to less than 1% of GDP. Primarily this has arisen as a result of constraints on the public financing capacities of Member States, together with divisions regarding the best expenditure patterns in some cases. Aside from moving towards a position of 'smarter' prices the purpose of recent EC Directives on HGV charging and rail charging has also been to finance infrastructure (CEC, 2006a). The 2001 White Paper envisaged that where infrastructure charges raised surplus revenue (above operating costs) such revenue should be earmarked for re-investment in the transport network through the use of national or regional funds. However, such an earmarking constraint met strong resistance from Member States during the development of the recent HGV charging directive (CEC, 2006b) and ultimately did not feature in the final directive.

Within this context a number of issues regarding the funding of transport infrastructure come into question.

1. How can sufficient funds be raised to meet the desire to construct new infrastructure?
2. If a decision is taken to raise more money from users than would be implied by first-best pricing, how may this most efficiently be done?
3. If a pricing reform actually raises a surplus for, or from, the mode or area in question how may this be spent to promote efficiency, equity and acceptability.

These three basic questions form the agenda for the IMPRINT-NET expert group convened to consider the implementation of pricing reforms with a particular emphasis on revenue raising and use. The group was formed in late 2006 and comprises members from government, researchers, consultants and other stakeholders. It met four times between February 2007 and April 2008.

It is clear that sufficient tax revenue is already raised from the transport sector in pre-2004 member states to fund both the operation of the existing transport network and its enhancement, if the only purpose of taxation were to do so. This finding remains unchanged if the taxation structure is altered to one where transport users face first-best prices. In new member states, with the exception of Bulgaria, less than 100% of fuel tax revenues are earmarked to the transport sector implying that the transport sector in

these states also makes a surplus. Further research is needed to confirm this position for new member states and the impact of first best prices on cost recovery. Revenue surpluses derived from the transport sector therefore form an important contributor to the fiscal budgets of all member states both pre-2004 and new member states. Of course many sectors of the economy produce more in tax revenue than is spent on that sector, and there is no reason in principle why this should not be the case: such revenue is used to finance the achievement of social, economic and environmental objectives, and choosing how to raise such funds is a legitimate activity of political processes. The protection of this revenue stream by member states is possibly one of the reasons why the EC Directive on HGV charging does not contain a clause on earmarking (except where charges are raised above average cost). The existence of surplus revenues is a source of division amongst the group. This is because the existence of surplus revenues is interpreted by some as implying that either prices are excessive or investment inadequate (or both). For others the existence of surplus revenues has no direct bearing on the level of appropriate transport funding, as for example such surpluses may be taken as indicative of the existence of external costs whose solution may not best be found in transport infrastructure investment.

Taking the existing transport taxation levels and infrastructure funding in different member states as given, additional funding for new infrastructure can be raised quite efficiently through additional road tolls or a fuel tax premium. The more differentiated the road tolling regime the more efficient the outcome is. Highly differentiated tolls (on top of existing taxation levels) improve efficiency whilst simple tolls and a fuel tax premium result in a slight worsening in efficiency. As the majority of the TEN-T priority projects are rail and inland waterway schemes funding the construction of these projects through road tolls and/or a fuel tax premium requires an income transfer (or cross-subsidisation) between modes. An alternative to cross-subsidisation is to only levy mark-up charges (or tolls) on the modes which benefit from the investment. For modes with high sunk costs (or large fixed costs), such as rail, ports and inland waterways, this can be highly inefficient. Charges levied on specific categories of road transport user, such as the German VFIG system which is levied on heavy goods vehicles, therefore represent an efficient way of raising funds for new infrastructure in situations in which they cannot be funded from existing taxes and charges, and in which cross-subsidisation is acceptable.

Dependencies between different components of a network imply that on efficiency grounds a pricing and funding strategy covering a whole network is likely to be more efficient than one only covering specific links. The latter for example would include charging a toll or mark-up charge to access a particular new piece of infrastructure, whilst the German HGV charging scheme is an example of a network based strategy. Differences of opinion exist among transport stakeholders, and these are reflected within the group, as to whether such strategies should be developed on a single mode basis or a multi-modal basis, partly as a result of differing opinions on cross-subsidisation between modes. From an efficiency perspective multi-modal strategies are superior. Furthermore for the TEN-T network co-ordination of pricing and investment principles and guidelines between member states is necessary. Some theoretical analysis has suggested that if co-ordination cannot be achieved the consequences of tax competition between member states may be so severe that it is

more efficient globally to prevent member states charging for access to the transport network than to have unregulated prices. However, it is not clear that action to prevent one member state from implementing pricing policies which are efficient, in its own interests, and in accordance with wider principles, could be acceptable.

Well-run infrastructure agencies responsible for collecting, financing and procuring new infrastructure could have advantages in terms of efficiency and acceptability compared to the state provision of such functions. Efficiency in the economy can be improved if transport projects are funded by transport users through an independent or arms length infrastructure agency – even if the charge faced by the transport users exceeds first best prices. This is because such an agency would be less susceptible to political interference in day to day matters. Acceptability of a pricing reform is also improved by the earmarking of the revenues raised from the charge, if the specific earmarking chosen is itself popular. Furthermore in terms of project selection transparency is ensured as the agency would follow a clear set of rules. On the other hand, powerful, rich, agencies set up with an ambiguous role between the state and the private sector can also have their own problems of accountability and the efficient use of funds.

Existing infrastructure agencies within Europe have limited powers. They are neither responsible for setting prices nor for selecting projects. Giving an agency powers to select projects would take the political dimensions of the investment process away from politicians and internalise it within the agency. Saying that, the political nature surrounding transport infrastructure decisions makes it unrealistic to take them completely outside democratic or political processes, particularly given that any set of investment rules an agency could use will be incomplete, for instance in dealing with the particular peculiarities or location specific externalities that individual projects may have. If the agency has only jurisdiction over a single mode, interactions with other modes will have to be considered elsewhere. Even if it is multi-mode there will be interactions with wider considerations, including other sectors of the economy, the regulation of carbon, regional development, land use planning, and welfare objectives. Thus whilst the choice of strategy and decisions on major projects will always remain political, an agency could be quite effective at making investment decisions such as prioritising a series of projects that constitute a strategy. The UK government for example is, following recommendations of the Eddington study, proceeding to set up an infrastructure planning agency that would make planning decisions on specific projects. These would be made within the framework of government policy statements, albeit sometimes those ‘policy statements’ might include a policy to implement a specific project.

Evidence from the US indicates that a European infrastructure agency would be vulnerable to ‘pork barrel politics’ in that lobbying for funds for local projects will be intense. Similarly a European agency would be vulnerable to funding the most risky projects as the EU has no comparative advantage in the sharing of risks. Under the principle of subsidiarity a European agency need have no involvement in project selection, which should be left to member states. Under this approach, it would follow that the role of a European agency would be confined to paying grants to national governments on the basis of clearly defined criteria (underpinned by a form of cost benefit analysis) which would have to include effects elsewhere in Europe which might

otherwise be neglected by the national government. Dunkerley, Mackie and Proost (2006), for example, recommend linking the level of funding to the proportion of through (transit) traffic. Grants would then relate to specific projects, or packages of projects, or policy interventions, though the agency would not determine which projects should go ahead. Such grants should be at least match-funded by member states to prevent cost escalation. Project selection would remain the jurisdiction of national governments or groups of such governments. A European infrastructure agency would also have a co-ordination role. There is a need for pricing strategies between member states to be co-ordinated to ensure efficiency. To ensure against technical incompatibility there is a need for technical standards to be co-ordinated. Co-ordination of evaluation procedures would also ensure transparency in the distribution of funds between projects.

Whether a European or national infrastructure agency should be publicly or privately owned and operated is an interesting question. The private sector is often considered better at management than the public sector. There are divisions of opinion about whether this has always been demonstrated, for example in public-private partnerships. When this applies, and if management of the network is the agency's most significant task, the agency should therefore be in private hands. Other arguments for the agency to be a private enterprise include: revenue from transport user charges and their investment in new infrastructure is excluded from the public balance sheet and the agency can borrow money from the financial markets – both of which free the government from public sector borrowing constraints that may restrict investment policy. However, for the agency to be a private enterprise important questions need to be answered: who would regulate the agency and ensure pricing, investment and maintenance strategies are fair? What is the regulatory model? How would the agency be incentivised to invest in new infrastructure when it is efficient to do so and the right infrastructure at that? Does the structure of prices ensure that commercial decisions take full account of social and external costs as well as private and internal ones? What impact would shareholders' interests, take-overs, market variations of share prices, financial instruments, and tax avoidance schemes have on decisions? Would the agency be prevented from taking some commercial decisions that would be normal for private companies generally, such as investing in other sectors if it is profitable to do so, disinvestment, or shifting its portfolio of projects? These are important questions which remain to be answered.

If the existing transport taxation and charging system were comprehensively replaced by one in which all transport users faced first-best prices, there would be no need for a European infrastructure agency to fund projects that exhibit constant returns to scale, such as roads or airports. Such infrastructure would be self-financing – the revenues derived from the infrastructure and collected by a national agency would fund the construction and operation of that infrastructure. In such a situation a European agency would have its role restricted to funding projects which have high fixed (sunk) costs such as rail or inland waterway projects. When first-best pricing does not occur, such as a scenario when existing taxation systems are supplemented by an additional charge, it is not clear whether a case can be made on efficiency grounds for a European agency to fund infrastructure that exhibits constant returns to scale (such as roads), and if so to what extent. As indicated above Dunkerley, Mackie and Proost (2006) suggest that the

maximum level that a European agency would fund a TEN-T project should be a direct function of the level of transit traffic. Whether this maximum value is conditional on the level of revenue derived from the additional charge levied on transport users is uncertain and would warrant further investigation.

Within the context of a network pricing and investment strategy if surplus revenues occur some form of income transfer between regions, modes and class of user will almost certainly need to occur. It is quite infeasible and most likely highly inefficient to ensure that surpluses are returned as capacity enhancements to exactly the same users and location as where the revenue was collected. Therefore some level of transfer or cross-subsidy is simply inevitable. Whilst the group are in agreement with this principle, there is no consensus regarding the form of earmarking. Several broad perspectives are identifiable: the revenue stays within a mode but can be invested in a different region from the one in which it was raised; the revenue can be invested in a different region or mode but needs to be in the same corridor as the one in which it was raised; the revenue can be invested in different modes but must remain within a region; and finally the revenue need only stay within the transport sector. Even with the narrowest criteria for earmarking there will be transfers: raising funds from one car driver and spending them for the benefit of a different car driver is no less a transfer than spending them for the benefit of a train passenger. These differing perspectives on the use of surplus revenue form a barrier to the implementation of a pricing reform. From an economic efficiency perspective there should be no restrictions on how the surplus revenue is invested. The money should be spent where it produces best value.

There are advantages and disadvantages to each of the three main alternative pricing systems: long run marginal cost pricing (LRMSC), short run marginal social cost pricing (SRMSC) and average social cost pricing (ASC). LRMSC pricing is most appropriate where capacity can be easily adjusted to demand. SRMSC pricing or SRMSC based pricing (with mark ups, smoothing and/or caps) is best where there are major indivisibilities and/or long time lags in adjusting capacity. ASC pricing is easiest to explain to the public, in that it does not generate large surpluses or deficits, but actually has a degree of arbitrariness and always involves loss of economic efficiency (unless ASC equals LRMSC or SRMSC). Ideally therefore a 'smart pricing' policy as advocated by the Commission should use prices based on marginal social cost (either long or short run depending on how easily infrastructure capacity can be adjusted to meet demand)). Prices may need to depart from first-best prices to prevent step-changes in prices (as new capacity becomes available), to ensure a higher degree of cost recovery and to ensure the infrastructure manager continues to invest in new infrastructure when it is efficient to do so. Regulatory measures may be used (for instance a cap on average congestion charges at the capital and external cost of providing new capacity) to prevent a situation in which excessive prices are charged and inadequate capacity provided.

As one of the difficulties with marginal cost based pricing is that it is difficult for politicians to put across how the reform will impact on transport users, an interesting question arises as to what exactly the differences are in prices between a system of marginal cost based prices (with mark-ups, caps and smoothing) and one based on long-run average costs with top-up congestion charges and subsidies in low trafficked parts

of the network. Will there be a material difference in the prices faced by users? Or is it just a case of presentation? This is a topic for future research. With respect to new member states a further difficulty with marginal social cost based pricing is the lack of detailed transport accounts upon which the tariffs/prices can be set. Significant methodological work would need to be undertaken before such prices could be determined. As there is little political will in the new member states for full-scale pricing reform this lack of data will act as a barrier to implementation.

Transport pricing reforms have met with strong resistance and will continue to meet with such resistance as they have significant distributional effects. There are a number of theoretical explanations for this resistance ranging from information deficiencies, a preference for the status quo, a tendency for people to find losses more painful than gains beneficial, and feelings for social justice. For a pricing scheme to be successful evidence points fairly clearly towards the need for the objectives of the scheme to meet the needs of transport users and the public as a whole, and be superior to other forms of transport measures. Revenues need to be re-distributed, alternative methods of travel need to be provided and fairness needs have to be considered very carefully. The benefits of the scheme should also be conveyed in an objective manner that focuses on the traffic and wider problems that people perceive as important, and solutions they perceive as credible.

The need to re-distribute revenues to achieve acceptability will affect the ability to charge first-best prices as taxation revenues in such a scenario are, for congested countries like the UK, so large that not all the revenues can be spent efficiently in the transport sector. If strict earmarking is required, this would lead to investment in poor projects. In that case it may be more efficient to charge prices below first-best, or to relax the requirement for earmarking. It would make no sense to provide an impoverished but highly congested region with a wonderful road network but inadequate drains, schools and housing. This conclusion will vary on a country by country basis as it depends not only on the level of congestion but also on its marginal external cost.

Public acceptability of a pricing reform will also vary across Europe with purchasing power. Where a country's citizens have little purchasing power and transport expenditure takes a significant share of the total household budget, acceptance of a pricing reform which charges them more will be lower than elsewhere.

A phased implementation strategy is needed to introduce a pricing reform. Such a strategy needs to be defined around barriers to implementation and needs to account for path dependency. To date efforts have focused on overcoming technological and legal or institutional barriers in the definition of a implementation path. It is also necessary to consider acceptability barriers. For example, a preference for a stable environment can lead to referenda after a pricing reform giving a more favourable outcome for implementation than referenda before a pricing reform. This raises a social dilemma as it is difficult to implement a pricing reform against an initial majority of voters and car drivers, even if sufficient people are expected to change their opinion after the reform, thereby creating a majority in favour of the reform. A better understanding of the dynamic nature of acceptability over time (during the preparation phase, during

implementation and post the decision) is therefore needed. This would include the acceptability paths for different stakeholders and their interactions with published opinion/media as well as the influence of lobby groups on the process.

Following this general discussion of principles, caveats and complications above, the following policy conclusions are based on a synthesis of research and discussion within the group. They command quite wide support but we emphasise that this is not unanimous. The conclusions are loosely grouped under the research questions posed to the group.

1. How can sufficient funds be raised to meet the desire to construct new infrastructure?

Conclusion 1 Transport taxation is an important source of revenue for governments to meet social, economic and environmental objectives in sectors other than transport; therefore it is likely that if increased spending on transport infrastructure is desired, some increased revenue from the transport sector will need to be sought. However charges for meeting the costs of the transport sector should be clearly distinguished from those for general revenue purposes, and revenue use should be transparent

Conclusion 2 A new transport pricing scheme should be introduced as part of a package of transport policy measures which is sensible and attractive in its own terms; the pricing element needs to be shown to be a necessary part of the package, and the best available solution to transport related problems.

Conclusion 3 A transport pricing reform should use prices based on short run marginal social cost (SRMSC) for infrastructure where it is difficult to quickly adjust capacity to match demand (such as roads, rail and inland waterways) and long run marginal social cost (LRMSC) where it is relatively easy to adjust capacity (e.g. terminal capacity at ports).

Conclusion 4 Some form of regulation of infrastructure managers is likely to be necessary to ensure that they do not abuse monopoly power through excessive prices and inadequate investment, or select projects on too narrow criteria. This may include price caps and scrutiny of investment programmes based on cost benefit analysis.

Conclusion 5 It is essential to continue explanation and education that external costs of congestion and environmental damage are just as real burdens on economies as the traditional costs of labour, materials, etc.

Conclusion 6 Research is needed to understand if there is a material difference in the charges derived from LRMSC or SRMSC pricing (with mark-ups, caps and smoothing) and charges derived from average social cost based pricing (with top-up congestion charges and low traffic subsidies).

2. If a decision is taken to raise more money from users than would be implied by first best pricing how may this most efficiently be done?

Conclusion 7 Prices may need to depart from either SRMSC or LRMSC in three situations. To improve cost recovery a mark-up inversely related to the price sensitivity of the traffic or market segment in question may need to be added. To ensure SRMSC prices do not fluctuate wildly as new capacity is added to the system some smoothing of the SRMSC price may be necessary. And where the costs and complexity of a true marginal social cost pricing scheme are not worth the benefits it brings a departure may also be necessary.

Conclusion 8 Pricing and financing schemes should be developed for whole networks. Developing a scheme for multi-modal networks will be superior in efficiency terms to developing separate schemes for each modal network.

Conclusion 9 There are efficiency advantages to ensuring the same guiding principles to infrastructure prices are applied across networks and across Europe. This is not the same as a harmonisation of prices; where costs vary, there is a *prima facie* case that charges should also vary.

3. If a pricing reform actually raises a surplus for, or from, the mode or area in question how may this be spent to promote efficiency, equity and acceptability?

Conclusion 10 Transparent earmarking of some of the infrastructure charge revenues to the transport sector will be necessary to achieve acceptability. Some form of income transfer (cross-subsidy) between regions, modes and class of user will certainly occur for practical reasons, and may be chosen in order to optimise overall benefits. There exist a wide range of opinions regarding the exact form of this income transfer making it difficult to achieve consensus; compromises as part of specific reforms will need to be sought.

Conclusion 11 All investments made using revenues from charges must meet criteria of efficiency, environmental impact, and equity. These allocations should be transparent, publicly reported, and subject to scrutiny, regulation and challenge by adequate political institutions.

Conclusion 12 Independent or arms length transport infrastructure agencies, receiving the surplus revenue from the infrastructure charges, may be more effective than government departments at managing the transport network and making investment decisions such as prioritising a series of projects that constitute a strategy. Objectives, strategies and decisions on major projects will always remain political and should be excluded from the role of such agencies. The decision rules and formal objectives set for such agencies must be simple and transparent enough to be usable, but great care must be taken to ensure that they contribute to, rather than undermining, the wider objectives of government.

- Conclusion 13** A European infrastructure agency, financed by member states via the infrastructure charges levied at a national level, could have a role in coordinating pricing principles, technical standards and evaluation procedures. In terms of funding projects its role should be confined to paying grants to national or local governments on the basis of clearly defined criteria (e.g. proportion of international traffic, and meeting international environmental objectives, etc) related to effects within EU competence. The grants would relate to specific projects, or packages of projects, or policy interventions and would be at least match funded within member states to prevent cost escalation. The agency would not determine which projects should go ahead, this decision remaining with national or local governments or groups of such governments.
- Conclusion 14** There is a lack of research and evidence as to a successful form of regulation if a transport infrastructure agency were to be privately operated. Poor performance of such an agency can have significant negative impacts on a nation's transport infrastructure (e.g. the UK experience with Railtrack and Metronet). There are arguably advantages to a transport infrastructure agency being managed by the private sector if this secures efficiency in management and ability to borrow from the financial markets. However, without evidence on an appropriate form of regulation it is speculation and opinion only that suggests one model of management (public or private) is superior to another. Further research in the area of regulation of transport infrastructure agencies is much needed.
- Conclusion 15** Acceptability barriers present the single biggest obstacle to the introduction of a pricing reform. Acceptability cuts across many of the themes identified in earlier conclusions: the need for a reform from the perception of transport users, the nature of the accompanying package, revenue use, transparency and fairness are all critical components of an acceptable scheme. A transport pricing reform also needs to be presented to the public in terms that can be easily understood. A charismatic champion and the correct timing of the policy all help contribute to acceptability.
- Conclusion 16** Important to the success of any implementation strategy is the influence that the implementation path has on acceptability, the dynamic nature of acceptability during the implementation process, the role of referenda and the interactions between different stakeholders and published opinion/media or lobby groups. However, research evidence on the specific nature of these effects is very limited, and research in this area needs to be actively pursued.

These conclusions are in the main equally applicable to all modes and countries. Saying that, two of the conclusions have mode specific dimensions to them. The first of these is conclusion 3 and relates to pricing structures for different modes and the second is conclusion 10 which relates to earmarking. For modes with high sunk costs and where efficient pricing leads to a revenue deficit (e.g. rail and inland waterways) charges will be earmarked to mode, but for other modes we do not see a clear case for earmarking to a mode. In the case of roads this is because whilst road user groups argue for such a policy, it will not guarantee acceptability. Many members of the public are against road building and within the road user groups there is not a consensus as to whether

surpluses from one region can be directed to another region. With respect to ports and airports surplus revenues may arise due to the port or airport authority holding the right to scarce capacity. As environmental or planning considerations may prevent a capacity expansion, the revenue arising from charging for scarce capacity should accrue to the government not the operator. Furthermore surplus revenue arising as a consequence of the internalisation of externalities should accrue to the government not the operator irrespective of mode. An exception would be where the infrastructure owner is required to meet specific mitigation costs. If the infrastructure operator were allowed to keep revenues associated with say charging for environmental costs a counter productive incentive occurs as the infrastructure manager has an incentive to attract environmentally damaging traffic.

There is a particular problem amongst new member states with lower incomes, but substantial transit traffic. There is a need to pay for appropriate infrastructure that would benefit the EU as a whole but a resistance to high charges which are unaffordable to the local population. This situation provides justification for income transfers between richer and poorer countries and may also justify continuation of a two-tier network with charges confined to higher quality long distance routes. The appraisal process also needs to account for the income differences between countries, otherwise infrastructure investment, funded by the surplus revenues, may concentrate in the high income core countries of the EU.

It is difficult to make recommendations regarding the order in which the conclusions should be implemented. The majority of recommendations depend upon acceptability being achieved and the dynamic nature of acceptability is little understood. In the absence of this knowledge the conclusions that focus on processes would lend themselves to being implemented in the short term. For example, it is clear that a transparent and efficient use of revenue is needed for a transport pricing scheme to be acceptable. Implementing appraisal processes that meet criteria of efficiency, environmental impact and equity, as set out in conclusion 11, would therefore be an important first step. In the longer term institutional reform is necessary. However, a European delivery agency that draws its funds from existing sources may act as an important intermediate step to complete institutional reform. The recommendations relating to charging structures, independent agencies and regulation can only be implemented once acceptability barriers have been overcome. These therefore represent medium to longer term objectives.

1. Introduction

The European Commission's 2001 Transport White Paper (CEC, 2001) identified the major transport policy challenges of the time to include an imbalance of demand between modes, congestion on major inter urban routes and in cities, as well as in airspace, and environmental impact. Key aims of the Commission's policy since 2001 have therefore been to reform the pricing of transport services with the aim of adopting marginal social cost prices (though this has since been adjusted to the adoption of 'smart' charges (CEC, 2006a)) and increased investment in the Trans-European Transport Network (TEN-T). The full cost of the 30 TEN priority projects, identified in 2006, is estimated to be approximately €340 billion.

Transport pricing reform is an important element of the Common Transport Policy, as its benefits contribute to all dimensions of sustainability. Whilst a substantial amount of European research into transport pricing has been undertaken over the last decade, the implementation of pricing reforms requires the improvement and enhancement of this body of scientific and practical knowledge. For example, the policy and research effort has been uneven between modes. It further requires that this knowledge is effectively passed on to the policy makers to allow them translate it into the formulation and implementation of policies. The overarching aim of the IMPRINT-NET project is therefore to bring together the existing knowledge base on transport pricing reforms, to disseminate it, and to identify gaps in knowledge. The medium for achieving this aim is six expert groups. Each group comprises of government, researchers, consultants and other stakeholders and each met four times during the course of the project.

This report reflects the discussions of the sixth expert group with its emphasis on revenue raising and use. It differs from the other five groups in that those groups considered an individual mode in isolation. The revenue raising and use expert group therefore has a multi-modal dimension, and in the main its discussions and conclusions are equally applicable to all modes. The importance of revenue raising and use within the context of the European Commission's transport policy is twofold. Firstly, the impacts of a transport pricing reform and its acceptability is intrinsically linked to the use of revenue, and secondly one of the purposes of recent EC Directives on HGV charging and rail charging has been to finance infrastructure (CEC, 2006a). The 2001 White Paper envisaged that where infrastructure charges raised surplus revenue (above operating costs) such revenue should be earmarked for re-investment in the transport network through the use of national or regional funds.

This report has the following structure. Following this introductory chapter, Chapter 2 gives some more detail on the expert group and its method of operation. Chapters 3, 4 and 5 concentrate on the evidence available and the discussions of the expert group under the themes of impacts of existing and envisaged practices, barriers to implementation and the institutional context. The concluding chapter, Chapter 6, brings the salient points of the previous chapters together and presents the policy conclusions. The structure differs slightly from the reports of the five other expert groups: there is no chapter on cost calculation as this was not part of this group's remit; and the institutional context of revenue raising and use has been placed in a separate chapter.

2. Brief history of expert group

Revenue raising and use has implications for economic efficiency, equity and acceptability. Clearly, revenue is already raised from existing transport systems, through a mixture of taxation and charges, and accrues to the state and the transport operator. National governments use this tax revenue along with other tax revenue (e.g. income tax) to fund their activities which may include further changes in the transport system. Marginal social cost pricing in the transport sector implies a significant reform of transport pricing. Such a significant reform appears very likely, for acceptability reasons, to have to be linked to how the revenue raised is used - for instance with the surplus revenue being hypothecated for further investment in the transport sector.

Research suggests that marginal social cost pricing for infrastructure use will generate at least as much if not more funding than is required for cost recovery, including servicing of capital costs (CEC, 1998; ECMT, 2003). However, this is at an aggregate level and revenue surpluses will occur for some modes and in some areas, whilst revenue deficits will occur in others. Typically we would expect surpluses for road networks and deficits for public transport systems that have high sunk costs (e.g. rail). Congested areas (e.g. urban environments) are likely to generate surpluses, whilst uncongested environments may be in deficit. The problem in financing new infrastructure occurs if the new infrastructure operates with a revenue deficit. The Commission's 2001 White Paper therefore proposed national or regional transport infrastructure funds as a mechanism by which surplus revenue could be hypothecated to facilitate transport projects that lessen or offset the external costs associated with transport. The White Paper envisages that surplus revenues from one mode (or area) may then be used to finance projects associated with a different mode or in a different area.

Clearly, such a policy of revenue use will raise efficiency, equity and therefore ultimately acceptability issues. If revenue is to be hypothecated to the transport sector this may result in a lowering of economic efficiency. This is because either there are insufficient economically efficient transport projects, or transport projects are less efficient than other types of project (e.g. education) which could have been financed through the revenue surplus. Equity issues may occur as the surplus revenue may well be directed to modes or areas which do not benefit those who contributed to the revenue surplus – thus one sector of the population may experience an increase in costs whilst another sector experiences the benefit. This may be unacceptable to those who bear the majority of the costs. Prices for transport infrastructure in areas or modes where revenue deficits exist may therefore need to be set at a level higher than marginal social costs would suggest in order to raise the necessary finance for new projects. Alternatively more local infrastructure funds (e.g. regional funds) may give the required degree of acceptance. However the success, in terms of economic efficiency and equity, of such funds depends upon how they are administered – i.e. who decides the prices to be charged, who decides which projects are to be invested in and what constraints the fund administrators are subject to.

Within this context a number of issues regarding the raising and use of revenue come into question.

1. How can sufficient funds be raised to meet the desire to construct new infrastructure?
2. If a decision is taken to raise more money from users than would be implied by first-best pricing, how may this most efficiently be done?
3. If a pricing reform actually raises a surplus for, or from, the mode or area in question how may this be spent to promote efficiency, equity and acceptability.

These three basic questions formed the agenda for this IMPRINT-NET expert group. In this context funding refers to who ultimately pays for an investment - e.g. users or government. This contrasts with the financing of a project which refers to the mechanisms to spread the capital costs over time – e.g. public private partnerships.

The expert group was formed in late 2006. The list of members is provided in Annex I. As with the other expert groups its programme was comprised of four seminars, though it differed from the other groups in that it met four times in just over a year. The seminars involve around 15 experts each, selected in order to guarantee a wide coverage of the transport sector in terms of geographical provenance and working area.

The first meeting of the group was on 14th February 2007 and gave an overview of the issues and the state of the art. It included a review of research and of EU policy and practices in the member states. The second meeting was held on the 11th May 2007 and was based on institutional aspects of funding transport infrastructure from transport charges. The third meeting was held on 4th December 2007 and considered implementation of pricing and funding reforms, whilst the final meeting was on 16th April 2008 and discussed the conclusions of this report. The agendas and the reports for the meetings are provided in Annexes II, III, IV and V. All group members participated in their personal capacity and not as official representatives of their affiliations. To this end the meetings were conducted under Chatham House rules. The source of individual comments and viewpoints is not therefore identified in the meeting notes or this report.

3. Impacts of existing and envisaged practices

3.1. Overview of existing revenue raising and use practices

3.1.1. Pre-2004 Member States

REVENUE RAISING

European inter-urban transport infrastructure is owned, managed and operated by a mix of the public sector and private sector. The pattern of ownership and operational responsibility varies by mode and by country. Typically roads and rail infrastructure are owned by the public sector, though there are exceptions to this, whilst ports and airports are often owned by the private sector. Additionally the recent emphasis on using private capital in the financing of new transport investments, in particular motorways and high speed rail lines, has led to concessions covering ownership and operation. In these circumstances new investment and operation is typically funded by a mix of public funding and user charges. The user charges are raised directly from those using the infrastructure, whilst the revenue from the public purse is raised from general taxation (including taxation of the transport sector e.g. vehicle excise duty and fuel tax). Investment in and the operation of inter-urban transport infrastructure is therefore funded by a complex mix of users and the general public.

Revenue from transport users is raised through a mixture of taxes and charges. The pricing strategies can be categorised as first-best, second-best and target-orientated pricing. Under first-best pricing the price paid by transport users is a reasonable reflection of short-run marginal social costs. First-best prices therefore result in an optimal allocation of demand between goods. When first-best prices cannot prevail, due to budget constraints or market imperfections, second-best prices can be used to approximate the optimal allocation of demand between goods. Mark-ups and multi-part tariffs may be used in second-best pricing. Target-orientated pricing occurs when prices are set to meet certain targets (e.g. full cost recovery, partial cost recovery or targets on environmental quality). The balance of taxes and charges varies by mode and country and we draw on the survey undertaken as part of the REVENUE project (Suter *et al.*, 2005 Chapter 2) to summarise this pattern.

Road

Road transport taxes in Europe comprise vehicle taxes and fuel taxes. Additionally, value-added tax (VAT) is levied on sales of vehicles, fuels and services. Vehicle taxes include ownership taxes, driving license fees and insurance taxes, and may also include a tax to cover the cost of scrapping the vehicle. There is lot of variation in the degree of disaggregation of these taxes (e.g. by vehicle type) between countries and in the level of tax charged. A similar level of variation is also found in the level of fuel tax.

In addition to these taxes inter-urban road users can often be faced with a number of access charges. Traditional motorway charging exists in many countries. Motorway charging can be distance or gate based and usually multi-part tariffs are used. In some cases externalities are considered when setting the charge level. Private concessionaires

operating the motorway may also have the freedom to set charges to maximise profits. Tolls are also often collected for the crossing of bridges and tunnels. Such tolls are nearly always target orientated (cost recovery) and are usually based on average cost pricing.

An additional charge faced by HGVs is the Eurovignette scheme in the Netherlands, Belgium, Sweden, Luxembourg and Denmark. A 'vignette' is bought for a fixed price per vehicle and gives access to the motorway network for a specified time period. The Eurovignette Directive 1999/62/EC was recently modified by Directive 2006/38/EC which sets common rules to be followed by Member States if they wish to have tolls and/or user charges for HGVs. The framework set out by the modified Directive requires tolls to be levied according to the distance travelled and the type of vehicle and user charges to be scaled according to duration of use made of the infrastructure and to vehicle emission classes. However, the total revenue obtained through the toll or charge is constrained to the total costs of constructing, operating and developing the infrastructure concerned - though to ensure compatibility with public-private partnerships (PPPs) a profit margin can be allowed. For mountainous areas average tolls may be marked-up by up to 25% above full cost recovery in order to cross-finance transport infrastructure in that corridor/zone.

Switzerland introduced a distance based charge for HGVs in 2001. The charge is set to cover the costs imposed by HGVs including external costs. From the 1st January 2005 Germany also introduced a distance based motorway charging scheme – to replace the time based Eurovignette. The basic rate (the toll varies by axle weight and emission class) was set to recover motorway renewal costs caused by HGVs - though the rate has been temporarily reduced to reduce the burden on the freight sector. The revenue from the charge is earmarked for re-investment into the transport sector with the larger share to be used for the road network (Gühneman, 2006).

Rail

Rail infrastructure management and train operation have been separated in almost every EU Member State surveyed by Suter *et al.* (2005), with track access charges being paid by operators for using the network. Operators receive revenues from their customers (passengers and freight distributors) and pay track access charges – often structured as multi-part tariffs – typically differentiated by gross train weight, type of train and type of infrastructure. In a survey of 20 European nations ECMT (2005) identified that two nations set track access charges according to marginal cost, nine set charges based on marginal cost plus a mark-up, whilst three set prices to recover full costs minus government subsidies and six set prices to recover full costs. The six nations setting prices to recover full costs are new member states to the European Union. Taxes, where they occur, are limited to fuel taxes.

Aviation

Airport pricing involves a broad range of charges – airport take-off and landing fees, air traffic control fees, handling fees – that often have a multi-part tariff structure. A number of airports also levy noise or other environmental charges. A passenger tax is also levied in some countries, whilst kerosene is exempt from VAT for international

flights. On domestic flights VAT is charged in the Netherlands, Norway and Switzerland.

Inland waterways

Suter *et al.* found that very few examples exist of taxes and charges in inland waterways. Average cost charging schemes are in place in several countries, while Finland uses a second-best (multi-part tariff) pricing structure. In some cases pricing is forbidden by law (e.g. on the Rhine and the major waterways in the Netherlands). Tax is, however, levied on fuel.

Ports

Ports are often not regulated, which leads to a pricing strategy that is very competitive. Suter *et al.* found evidence of multi-part tariffs, average cost pricing and in France a form of Ramsey pricing (mark-ups on marginal cost for cost recovery).

REVENUE USE

Once again drawing from the survey undertaken by Suter *et al.* (2005) revenue use from transport infrastructure charging varies both between nations and between modes. In part this stems from the different involvement of the private and public sector in the operation of different modes of transport but it also reflects the varying level of revenue by mode that can be generated through charges and taxation of transport services.

Road

In the main the majority of fuel tax revenues generated from the road sector go to the general government budget without any earmarking. However, some earmarking does occur: in Finland and the Netherlands, a small part of the fuel tax is earmarked to cover the expenses of maintaining a strategic oil reserve to guarantee the supply of fuel. In Germany, 3% of the fuel tax is earmarked for urban public transport. In the UK, any increase in the fuel tax above inflation level must be used for transport projects. In Switzerland, 50% of the revenues from the fuel tax belong to the treasury. The other 50% are used for construction and maintenance of the national motorway network as well as the construction of the new transalpine railway tunnels. A similar situation also occurs with vehicle taxes: in the main they accrue to the central government's budget, but some examples of earmarking exist. In Germany and Switzerland vehicle taxes are earmarked to the region, whilst car scrapping taxes are earmarked.

Road charges on roads operated by private concessionaires are internally earmarked so that concessionaires can recover their investment. At the end of the concession period it is common that the revenue from the charges is obtained by the state. The revenue from the public sector operated toll roads and bridges also accrues to the state though in some instances it can be earmarked for the maintenance of the tolled infrastructure. In the UK road pricing legislation guarantees that revenue from road user charges is earmarked for use in the transport sector by the authority collecting the charge for at least ten years.

Road charges and in some cases taxation can also be earmarked to infrastructure funds. In Europe four states, Austria, Germany, France and Switzerland, have such infrastructure funds. A brief description of these follows.

- In Austria revenues from motorway charging accrue to ASFINAG. ASFINAG plans, manages and finances the Austrian motorway system. It can obtain capital from the capital market with loans underwritten by the state. Investment priorities are determined in collaboration with the state and the motorway charges are set by the state.
- VFIG is the multi-modal infrastructure funding agency in Germany with responsibility for financing and financially managing transport infrastructure procurement at a federal level and for the preparation and undertaking of PPP projects. It receives its funds from the federal budget - though the HGV distance based motorway charge and inland waterway charges are earmarked for the transport sector. A debate currently exists as to whether the VFIG should have direct responsibility for collecting the HGV and inland waterway charges, whether cross-financing between modes is acceptable and whether the agency should have access to the capital market (Proost *et al.*, 2006).
- In France the recently established infrastructure financing agency AFTIF was founded with the principal aim of fostering the completion of fifty large infrastructure projects. The agency is multi-modal covering road (motorway), (high-speed) rail, coastal and inland waterway shipping as well as sea port projects. It receives its financing from state owned motorway tolls, regional planning tax, 40% of revenues from radar controls, and subsidies from public budgets. It has no role in project selection or the planning process – its focus is purely on delivery and financing (Proost *et al.*, 2006).
- In Switzerland the FinöV infrastructure fund is responsible for financing and delivering improvements in the Swiss rail network as set out in pre-determined investment programmes (RAIL 2000 and New Alpine Railway Tunnels), rail noise abatement programmes and developing links to other countries high speed rail networks. 67% of the Swiss HGV charge is earmarked to this fund¹. The FinöV fund also receives its funding from VAT (up to 0.1% of VAT receipts), fuel tax (up to 25% of fuel tax receipts), from loans from the government and can also finance projects through a PPP mechanism (Cretegnny *et al.*, 2005).

Rail

Railways rarely generate surpluses and the rail operator(s) are often recipients of subsidies to cover shortfalls in revenue compared to operating costs. Against such a backdrop revenue generated from rail users is therefore kept within the rail sector. Clearly where some VAT or fuel taxes are paid these accrue to central government. As set out above rail can be a beneficiary from charges levied on other modes (e.g. the AFTIF and FinöV funds).

Aviation

Aviation related taxes are usually earmarked (Suter *et al.*, 2005) even when levied for environmental purposes – for instance, noise charges are typically earmarked for noise insulation purposes. Passenger tax however usually accrues to central government. Aviation charges (landing charges, handling fees, air traffic control, etc.) are internally

¹ The remaining 33% going to the regions, which use it for amongst other things, road construction and maintenance

earmarked within the air sector to pay for the service received. Notwithstanding that there appears to be some cross-subsidisation between airports if owned/operated by a single authority (e.g. BAAC in France and BAA in the UK).

Inland waterways and ports

Normally charges levied for use of inland waterways are internally earmarked by the charging authority. In Germany charges for inland waterways accrue indirectly to the VFIG infrastructure funding agency. The private sector nature of ports means that charges are also usually internally earmarked to the port where the charge is levied. Fairway charges in Finland and Sweden, associated with navigational aids, pilotage, search and rescue operations as well as ice-breaking, are possibly the exception.

COST RECOVERY

A substantial amount of revenue is raised through the existing user taxation and charges system. For example, and as seen in Table 3.1, ECMT (2003) estimates that in the year 2000 almost €60 billion was raised from the British transport system. Furthermore across the whole transport system infrastructure cost recovery (including VAT receipts) was in the region of 266% for Britain, 136% for France, 210% for Germany, 164% for the Netherlands and 292% for Finland. The majority of this revenue is raised through road taxation. It can also be seen that cost recovery for the rail, metro and waterway modes is low – even given the difficulty in allocating costs between operations and infrastructure. With these levels of cost recovery it is apparent that the transport sector is heavily taxed and is in fact one of the major sources of government finance in pre-2004 member state economies (ECMT, 2003).

Table 3.1 Revenues, infrastructure costs and cost recovery for selected pre-2004 member states under existing taxation and charging structures

	Contribution to fiscal revenues incl. VAT (billion Euro per annum)	Infrastructure costs (billion Euro per annum)	Infrastructure cost recovery
BRITAIN			
Road	59.05	17.00	347%
Metro	0.14	2.00	7%
Rail	0.65	3.50	19%
Total	59.84	22.50	266%
FRANCE			
Road	48.87	26.55	184%
Rail	0.2	8.83	2%
Waterways	0.03	0.66	5%
Total	49.1	36.04	136%
GERMANY			
Road	54.33	19.86	274%
Passenger Rail	2.35	2.72	86%
Freight Rail	0.29	3.63	8%
Waterways	0.00	0.89	0%
Total	56.97	27.1	210%
NETHERLANDS			
Road	12.2	4.93	247%
Rail	-0.44	1.87	-24%
Waterways	0.03	0.41	7%
Total	11.79	7.21	164%
FINLAND			
Road	4.38	1.18	371%
Metro	-0.01	N/A	N/A
Rail	0.19	0.38	50%
Total	4.56	1.56	292%

Note 1: 2000 prices and traffic demand levels

Note 2: Includes urban and inter-urban transport networks

Note 3: This only shows cost recovery for infrastructure. With respect to rail and metro there is a degree of arbitrariness regarding how costs are allocated between infrastructure costs and operating costs and to what extent each requires subsidy. It is for this reason that revenues for rail and metro can appear negative.

Source: ECMT(2003 Table 11a)

Considering the first research question posed, in pre-2004 member states we can see that sufficient revenue is already generated to cover both transport infrastructure costs and fund additional investments. The fact that there is an apparent shortage of funds for transport investments occurs because revenue generated from the transport sector is not earmarked for the sector but is diverted to support government finances. Whether such a scenario should continue is ultimately a political question but the economic implications of doing so are discussed below in Section 3.2. If the transport sector (e.g. roads) is to remain heavily taxed without earmarking, the issue then becomes one of considering the implications for efficiency, equity and acceptability of imposing further user charges in addition to these taxes to fund new investments - particularly if that meant the total price faced by users exceeds first-best prices. This is related to the second and third research questions posed.

3.1.2. New Member States

There is a quite detailed and well-developed regulatory background in the New Member States (NMSs) regarding revenue raising and use within the roads sector. The reason for this is that road transport is of strategic importance within the commercial and fiscal economy. A survey of existing practice for the roads sector in Estonia, Latvia, Lithuania, Poland, Czech Republic, Hungary, Romania and Bulgaria is presented in Annex V of this deliverable (Tánczos, Kosztyó and Mészáros, 2008). From this survey it is apparent that the most important sources for financing road network operation, maintenance and improvement are the state budget, dedicated road funds (that lie either inside or outside of the state budget), EU funds, international financial institutions' (IFIs) loans and revenues from business activities. Procurement of new infrastructure through the use of public private partnerships (PPPs) with direct tolling or availability payments is either under way or being prepared for in all the countries surveyed.

Aside from Estonia and Latvia almost all countries apply road tolls on the motorway network or the whole national network. HGVs and buses are always subject to tolling (time duration dependent vignettes or mileage-based direct tolls). The only electronic toll collection system currently in operation is that in the Czech Republic (for HGVs and buses), though initiatives exist for such systems in other countries. Annual vehicle taxes and fuel excise duties are always applied in the NMSs. Differing pricing and revenue allocation approaches between NMSs can in part arise through differences in road administration (number of levels, responsibilities, institution in charge). For example where the motorway and national road network is controlled by a state owned national company or institution, a country-wide tolling system is commonly used (e.g. Lithuania, Poland, Romania), and where the road administration structure is fragmented pricing and revenue practices between countries diverge more.

Revenues from road tolls are earmarked for improving the national road network, where a road fund or an earmarking target exists, but in some cases they are directed to the State Budget. Where tolls on PPP financed roads exist they are earmarked for financing these projects. In contrast to the pre-2004 member states significant earmarking of road revenues exists in NMSs. Aside from Hungary fuel tax incomes are, for example,

generally earmarked to a road fund (though the percentage varies from 100% of the fuel tax earmarked in Bulgaria to 18% in Poland). Revenues from vehicle taxes can go to the state budget, local/municipal budgets or a road fund. Despite the prevalence of earmarking and/or road tolls, network operation, maintenance and investment costs can exceed earmarked revenues. Where costs exceed revenues the difference tends to be financed from the state budget. This can also apply to PPPs. Some PPPs do not recover all costs as national stakeholders prefer price caps on tolls due to the low purchasing power of NMS transport users. The mechanism for financing from the state budget any deficit between revenues and costs for a PPP can differ between shadow tolls (e.g. as planned in Estonia) or availability fees (e.g. Hungary).

3.2. Efficient revenue raising

Economic theory indicates that the first choice for taxation is to levy charges on the production of externalities at a rate determined by marginal external costs. That is a tax would be levied on the use of transport infrastructure that ensured the price faced by users of the transport system is equivalent to the marginal social cost imposed from using it. In an ideal economy if further revenue is required this should be raised through taxes on inputs (labour and capital) and outputs (finished goods). Intermediate goods, such as freight transport, ideally should not be taxed (beyond internalising externalities) as this distorts the production process. Furthermore transport operators should pay the same level of taxes on labour and capital as in other sectors of the economy. However, if first best prices do not raise sufficient revenue, higher levels of taxes on transport outputs than those faced in the economy as a whole may be justified if transport use is particularly insensitive to price or heavily concentrated in higher income groups. Moreover, there may be a case for price differentiation to charge high charges in particular markets which are insensitive to price (Ramsey pricing), or for multi part tariffs where a fixed charge may be levied without excluding large numbers of consumers from the market. For a more detailed review and discussion on efficient taxation of the transport sector the reader is referred to ECMT (2003).

Ideally therefore we would not wish to raise tax on transport to a level at which transport users face a price greater than marginal social cost (i.e. efficient or first-best prices). Evidence on transport costs and efficient prices is considered in more detail by each of the modal expert groups, however, at an aggregate level existing evidence suggests that a shift to efficient first-best prices would generate sufficient revenue to ensure cost recovery in the pre-2004 member states (see Table 3.2). In fact compared to existing charges and taxes a shift to first best prices would increase the revenue derived from the transport sector for nations that experience congestion such as Britain, France, Germany and the Netherlands and decrease revenue for countries where congestion is not as large a problem (Finland) (ECMT, 2003 and comparing Table 3.1 and Table 3.2). As with existing charges and taxes there is significant variation in the level of cost recovery by mode. Substantial surpluses are expected from road networks whilst metro networks and rail networks are expected to only recover a fraction of their costs. Variation by area type is also expected with the most congested parts of the network generating the largest surpluses. For example, the ECMT work suggests that the inter-

urban networks will generate between about 40% (France and Britain) and 80% (Finland) of total revenues. Under first best prices therefore the issue identified in Section 3.1 remains. That is for pre-2004 member states the issue is not whether the transport sector can generate sufficient revenue to recover investment costs, but whether the revenue generated from the transport sector should be earmarked for use in the sector or should be directed to the state budget. If revenue continues to be directed to the state budget should additional charges be levied on the network to fund new infrastructure?

Table 3.2 Revenues, infrastructure costs and cost recovery for selected pre-2004 member states under first-best charging (and tax) structures

	Contribution to fiscal revenues incl. VAT (billion Euro per annum)	Infrastructure costs (billion Euro per annum)	Infrastructure cost recovery
BRITAIN			
Road	79.52	17.00	468%
Metro	-0.05	2.00	-3%
Rail	1.21	3.50	35%
Total	80.68	22.50	359%
FRANCE			
Road	65.15	26.55	245%
Rail	0.59	8.83	7%
Waterways	0.02	0.66	3%
Total	65.76	36.04	182%
GERMANY			
Road	90.11	19.86	454%
Passenger Rail	0.56	2.72	21%
Freight Rail	0.00	3.63	0%
Waterways	0.15	0.89	17%
Total	90.82	27.1	335%
NETHERLANDS			
Road	15.95	4.93	324%
Rail	0.20	1.87	11%
Waterways	0.07	0.41	17%
Total	16.22	7.21	225%
FINLAND			
Road	3.39	1.18	287%
Metro	0.01	N/A	N/A
Rail	0.09	0.38	24%
Total	3.49	1.56	224%

Note 1: 2000 prices and traffic demand levels

Note 2: Includes urban and inter-urban transport networks

Note 3: This only shows cost recovery for infrastructure. With respect to rail and metro there is a degree of arbitrariness regarding how costs are allocated between infrastructure costs and operating costs and to what extent each requires subsidy. It is for this reason that revenues for rail and metro can appear negative.

Source: ECMT(2003 Table 11a)

One component of the FUNDING project considered the efficiency of the latter point explicitly in the context of the financing of the TEN-T priority projects (De Ceuster *et al.*, 2007) – i.e. funding the TEN-T priority projects with a mark-up on top of existing taxes and charges). The TREMOVE model was used to calculate the impacts of raising the subsidy required for the completion of the TEN-T priority projects through a mark-up on fuel tax (applied to all modes) or the introduction of either a simple road toll or more sophisticated road tolls differentiated by vehicle type, time, location and in one scenario by country as well². These mark-ups (either on fuel tax or as road tolls) would be applied across the EU. **Fehler! Ungültiger Eigenverweis auf Textmarke.** summarises the main results. A welfare cost in excess of one implies the method of raising the additional funds is inefficient, whilst a welfare cost of less than one indicates that the mark-up actually improves efficiency. As can be seen from **Fehler! Ungültiger Eigenverweis auf Textmarke.** in the main the welfare cost per euro raised is close to one – including for the fuel tax mark-up. The most efficient mark-up considered is a highly differentiated road toll. Whether such a mark-ups could be implemented against the backdrop of a heavily taxed transport sector is unclear, particularly given the blurring in the public’s mind between vehicle and fuel tax and a charge for use of the road system. Such a blurring can make it difficult to introduce an additional charge to use the road system – as the public believes it is already paying for use of that system. What constitutes an acceptable balance between charges and taxation within the sector is still not clear.

Table 3.3 Tax revenue needs and efficiency costs of raising extra tax revenues in the transport sector to fund construction of the TEN-T priority projects

	Moderate subsidy scenario for TEN-T priority projects (15% of project costs are subsidised)	High subsidy scenario for TEN-T priority projects (59% of project costs are subsidised)
Total extra tax revenue needed per year (billion euro)	3.84	15.13
Welfare cost of raising 1 euro in the transport sector in 2010		
Simple road toll	1.016	1.019
Road toll differentiated by vehicle type, time and location	0.996	1.015
Road toll differentiated by vehicle type, time, location and country	0.949	0.964
Additional fuel tax (all modes)	0.997	1.001

Source: De Ceuster *et al.* (2007 p29)

² The majority of the TEN-T projects are rail or IWW projects, thus these scenarios assume cross-subsidisation (or an income transfer) between road and rail or IWW is acceptable.

Abstracting to a situation where marginal social cost pricing exists where, as discussed, a positive cost recovery ratio at a transport sector level will probably occur in pre-2004 member states (see Table 3.2) it may not however be politically feasible to direct surplus revenues from some modes (road) to other modes (rail) or from some regions (e.g. cities) to other regions (rural areas). In such a case it may be necessary to raise prices above marginal social cost for the modes or networks that do not recover costs to improve the cost recovery. If the price of one mode is marked-up above marginal social costs to fund future investment or full-cost recovery this is referred to as an internal mark-up, whilst if all prices in the whole transport sector (in say the region where the costs are not fully recovered) are marked-up to fund investment in one mode this is referred to as an external mark-up. In a simplified model where only one mode of transport exists a mark-up that meant price exceeded marginal social cost would generate a welfare loss due to over-pricing of the infrastructure use – equivalent to the deadweight loss associated with monopoly pricing. This welfare loss increases in a multi-modal situation if alternative modes are not similarly marked-up – due to the single modal mark-up distorting the mode choice decision. Therefore if mark-ups are necessary to raise funds to finance infrastructure improvements on only one mode, the welfare loss can be minimised (i.e. efficiency maximised) if mark-ups are applied to all modes – not just the one for which the funds are being raised – with higher mark-ups on modes where demand is less sensitive to price. As part of the FUNDING project Proost *et al.* (2006 chapter 4) demonstrate this through the use of a simple uni-modal model and bi-modal model to demonstrate that low cost recovery ratios (e.g. 0.3 as is often typical for rail networks priced at marginal social cost) can be improved through the use of mark-ups. However, the efficiency loss for each euro of extra revenue raised can be high. For example, once the cost recovery ratio had been raised to 0.36, each euro of extra revenue imposed an efficiency cost of 2.5 euro in the uni-modal model, and 2.8 euro in the bi-modal model. Starting from a low cost recovery ratio, such as 0.3, they conclude that whilst higher cost recovery is possible it remains very costly in efficiency terms if not impossible to reach full cost recovery. This contrasts quite strongly with the small efficiency costs of raising revenue through for example a fuel tax and cross-subsidising rail from the tax revenue. Clearly their model is sensitive to the assumptions including the ability to optimally adjust capacity to match demand. Notwithstanding that it does demonstrate the potential that mark-ups may impose high efficiency costs, and it is more efficient to mark-up all modes of transport than just the mode in which the additional revenue is required.

The main focus of the FUNDING project is the partial funding by the EU of large infrastructure projects on the TEN-T. Some of the research undertaken as part of FUNDING demonstrates that a role for EU intervention can exist for such large projects in terms of setting price caps and subsidising infrastructure investments. This is because it can be demonstrated that it is not in the interest of member countries and regions to follow efficient pricing and investment policies where there is transit traffic (through traffic). Proost *et al.* (2006 Chapter 3) use simple network models to illustrate this. In serial networks (where transit traffic uses infrastructure consecutively in two or more member states) the main problem with unilateral investment and pricing decisions is the potential for excessively high tolls to be set. This is the case even where local and transit traffic pay the same toll. The problem may be so severe that it may be better not to allow any user charging at all than to leave complete freedom with national

governments. Capacity in the serial case is also below the optimum. In parallel networks (where transit traffic has a choice of which country to pass through) the models demonstrate that in the absence of user charges countries when faced with transit traffic have a substantial incentive not to invest in infrastructure. If allowed to levy user charges, including the ability to discriminate against transit traffic, the incentive of additional tax revenues increases the incentive to invest – though capacity is still below the optimum. Competition between countries however ensures that tolls are not as excessive as in the serial competition case. It is, however, only when countries co-operate in their investment and toll-setting decisions that capacity is optimised and the welfare of the citizens of each member state and the welfare of the transit traffic is maximised.

On efficiency grounds there is only a case for the EU subsidising investment costs where fixed (sunk) costs of investment are high (i.e. where the marginal cost of capacity expansion decreases) or when transit traffic exists. This is because where the fixed costs of investment are high cost recovery will be less than 100% (with efficient first-best pricing). The existence of transit traffic is indicative of spillover benefits to other EU countries which would suggest some form of co-funding of the transport project between countries. This implies that the case for the EU subsidising rail and inland waterway (IWW) infrastructure is high, but it is weak for road and airport infrastructure projects (which typically exhibit constant returns to scale). However, if member states do not charge MSC prices for transport and compete for tax revenues from transit traffic the case for any intervention by the EU on efficiency grounds dissipates (even for rail and IWW projects) (Proost, 2007). A case for intervention may also exist on social inclusion/equity grounds as peripheral countries need access to the core of Europe.

A funding mechanism to allocate EU funds needs to account for the fact that lobbying for federal funds for local projects can be intense - giving rise to ‘pork barrel politics’³ - and the fact that public money is costly (it is mainly raised through distortionary labour taxes). A funding allocation mechanism based on the proportion of transit traffic (X) and the marginal cost of public funds (MCPF) is therefore proposed in FUNDING (Dunkerley, Mackie and Proost, 2006 p7). From theory the proportion of transit traffic (X) is important in determining the pricing and investment behaviour of member states. X is also important in determining the financial viability of a project from the perspective of a member state. X is therefore an important parameter in handing out subsidies, though its precise form in the funding allocation mechanism is open to debate. How X should be measured is also an important issue – is it the proportion of transit traffic before or after the scheme is introduced, does it relate to a particular point(s) or is it some sort of average, etc. There were some views within the group that bilateral financing of a project is better than EU financing. This would therefore restrict the role of an EU intervention to one in which transit traffic passes through at least 2 member states (e.g. Germany to the UK, or Ireland to France).

³ Pork barrel politics is a term used for the appropriation of government spending for projects that are intended primarily to benefit particular constituents or campaign contributors.

A further, albeit preliminary, conclusion from the FUNDING project is that the welfare costs of raising revenue to fund the TEN-T projects from the transport sector is much lower than the costs of raising the funds through distortionary labour taxes. This of course does depend on whether the funds raised are invested in good transport projects. Some TEN-T projects have poor rates of return. It was therefore commented that EU subsidies should only be directed towards projects which exhibit a good cost benefit analysis.

3.3. Efficiency of revenue use

Economic theory informs us that earmarking of government funds may lead to a loss in efficiency, as there is no guarantee that the sector to which the funds are earmarked will contain projects which generate the highest welfare. This would suggest that governments should be given a 'free-hand' in determining how revenues raised from the transport sector should be used. On the other hand theories of the political economy and the role of lobby groups within the decision-making process suggest that government may not necessarily act so as to maximise society's welfare as a whole, but may act to maximise the welfare of a subset of society. In such situations earmarking may increase efficiency if it deters politicians from making decisions in their self-interest. It is not therefore clear cut as to the most efficient mechanism by which revenue raised from the transport sector should be administered and used. In part the question as to what the most efficient use of revenue is becomes an empirical question determined by investment opportunities and the institutional and legislative structures that exist. Drawing from the results of the REVENUE project (de Palma *et al.*, 2007) these issues and trade offs are illustrated below.

The Edinburgh case study identified that earmarking revenues to the transport sector means that welfare is maximised with prices well below first best prices – earmarking therefore reduces the potential welfare benefit of a pricing reform. This occurs due to there being insufficient good transport projects in which to invest the revenue. The German HGV toll case study found contradicting results that depend on the modelling framework. Using a static equilibrium model results similar to those in Edinburgh were found - whereby welfare was maximised if revenues were allocated to the general budget (and other direct taxes were lowered). On the other hand a dynamic modelling framework suggested that earmarking revenues for use in the transport sector maximised welfare - potentially due to the productivity gain throughout the economy due to the transport investments. These contradicting results are slightly unsettling and suggest further research in this area is needed.

Fiscal distortions caused by the efficiency loss associated with the marginal cost of public funds (MCPF) were found to result in first best marginal social cost prices (MSCP) to be sub-optimal in two case studies - the Swiss trans-alpine (Suter, 2007) and the French multi-modal fund. In both circumstances welfare was improved by raising prices above MSCP to help fund infrastructure, whilst reducing levels of direct taxation (e.g. on incomes). The welfare effects of MSCP were also found to be dependent on the MCPF. The impact the MCPF has on efficiency also implies that where investments are pre-determined (as in the Swiss case study or the French case study) it is more efficient

to fund the investments through an infrastructure fund financed by transport user charges than to fund the investment from general taxation.

The efficiency of cross-financing or cross-subsidisation – where the surplus from charges on one mode are used to invest in another mode’s infrastructure – is also situation dependent. The Oslo case study found that cross-subsidisation of public transport from road revenue surpluses was efficient as did the Swiss and French inter-urban case studies with respect to the cross-subsidisation of rail from road surpluses. On the other hand the German HGV case study found that cross-subsidisation of inter-urban rail freight using the HGV charges was not efficient. The differences were attributed to the particular settings of each study with public transport service levels in Oslo below optimum and the level of congestion on the German motorway network being problematic.

Efficiency is also affected by the types of project that are undertaken within a mode (road) or sector (public transport). Key issues relate to the type of project and the location of the project. The theoretical analysis set out by Proost *et al.* (2006) and discussed in the previous section identify the conditions when a country or region will under-invest in infrastructure. The Edinburgh case study in the REVENUE project supports this analysis as it was found that there is a strong incentive for the City of Edinburgh Council to use revenue to fund projects that benefited its residents exclusively – i.e. to fund projects within Edinburgh only despite many of those paying the charge living in neighbouring authorities. Notwithstanding that the local authority had proposed an equitable revenue sharing scheme with other local authorities probably as a result of regulation from the Scottish Executive. The German case study found that directing investment to improved maintenance rather than capacity expansion was most efficient. This is due to the high costs of capacity expansion including the increase in long-run maintenance - a different set of costs in different circumstance may, of course, result in a different outcome.

Related to the issue of earmarking and cross-subsidisation between modes is the issue of control. Ultimately some statutory body has to have responsibility for the revenues that accrue from the user charges and has to make decisions regarding the projects that will be invested in. Where transport networks between regions and countries are substitutes or are complementary a loss of efficiency can occur if the decision-maker acts in the self-interest of their region. The potential for this from government decision-makers is demonstrated in the case study of congestion charging in Edinburgh in the REVENUE project and in the case of infrastructure funds for the US FHTF fund. The Edinburgh situation has already been outlined above, whilst the mechanism of control and funding of the FHTF, it has been argued, has resulted in an oversupply of inter-state scale infrastructure in urban areas and a funding allocation methodology that gives rise to an imbalance in funding between rural and urban dominated states. This funding allocation mechanism has also been difficult to change over time (see Proost *et al.*, 2006 for a review).

4. BARRIERS TO IMPLEMENTATION OF PRICING REFORMS

4.1. Resistance to road pricing reforms

Resistance to road pricing reforms can arise, even when the reforms are beneficial to society as a whole, due to the obvious conflicts which always arise when changes which are good for the community as a whole, are bad for specific groups within it. This is entirely rational and relies on good institutional arrangements to resolve, by suitable compensation or political process. However, even where such conflicts are not a problem, there can still be resistance to change when people can deviate from idealised precepts of rationality in many settings (Kahneman and Tversky; 2000; Simon, 1955). Cognitive psychology and behavioural economics emphasise, among others, the role of the status-quo, loss aversion, framing (is it a penalty or a bonus?), hidden tax bias (people prefer hidden over visible taxes as this leads to less hedonic pain), the desire to reduce inconsistency between attitudes and behaviour (cognitive dissonance theory), and habit as significant determinants of actual human judgement and behaviour.

The *status-quo bias* refers to the fact, that in general people like things to stay relatively stable. There are several well-documented examples which demonstrate the aversion of people to alter the status quo (see Camerer, 2000). But why do people favour the status-quo? Some insight into this question is offered by prospect theory (Kahneman and Tversky, 1979). Prospect theory claims that human evaluations are not absolute but relative to a baseline or reference point. For instance, if following a policy change the benefit received is less than expected, even if you are better off you may value this outcome as a loss – as the expected outcome acts as the reference point rather than the existing situation. A second important issue is that losses or disadvantages have a greater impact on people's preferences than equal gains or advantages. When the status quo situation functions as reference point for evaluating different options, the disadvantages of leaving the status quo situation are weighted more heavily than its advantages, resulting in a *bias in favour of the status quo*. Loss aversion refers to the tendency for people to more strongly prefer avoiding losses than acquiring gains. Many studies suggest that losses are as much as twice as psychologically powerful as gains. The aversion to loss means that people are willing to take more risk to avoid losses than to make gains. *Framing* refers to the effect whereby the same question or choice set, described differently (e.g., in terms of gains or losses) can elicit different answers (Tversky and Kahneman, 1986). For instance, it makes a difference whether a glass is described as “half empty” or as “half full”. Thus, people are vulnerable to a wide range of *heuristics* and *biases*, leading to inconsistent judgement and evaluation also with regard to road pricing.

Research into the acceptability of road pricing specifically identifies that negative expectations dominate (as time gains are too abstract, whilst the road price is very visible), those who expect to gain perceive road pricing as fair, effective and socially desired (and vice versa), there are doubts about the effectiveness of road pricing at solving transport problems, there is no income effect (i.e. those with high incomes are

no more likely to accept road pricing than those with low incomes), and individuals' social values (norms) have an affect on acceptability as do the system characteristics. Recent research presented has also indicated that cognitive dissonance theory is also relevant. Those people who perceive road pricing as inevitable are more likely to develop a positive attitude towards it than those who do not (Schade and Baum, 2007).

There is evidence to suggest that acceptability for a road pricing scheme erodes the closer to implementation one gets. This can be because for example privacy concerns, technology costs, trust in government to use data correctly (and not lose it), etc. become more pertinent the closer one gets to implementation. Evidence also suggests that acceptability for a scheme improves post-implementation. Such an improvement in acceptability can be put down to both status-quo bias (people prefer the current situation whatever that is), cognitive dissonance reductions (people adjust their attitudes towards the new situation) and information deficit (in that prior to implementation people could not fully understand how the scheme would impact on them). Either way it would suggest that referenda on road pricing schemes should not be held prior to implementation. If they are to be held at all they should occur post-implementation (as in the Stockholm scheme).

Whether a referendum is needed is a political decision. One viewpoint is that politicians are democratically elected and therefore have a mandate to introduce new policies without the need to recourse to a referendum. On the other hand, referenda or direct voter participation increase perceived 'procedural fairness' of policies often considerably (Frey, 2003). Research in social sciences has shown that often the decisive factor in the acceptability of a certain policy is actually the process or procedure rather than the expected outcome. The introduction of difficult policies in the absence of a referendum requires a strong leader with conviction and a degree of sensitivity. Such a leader provides a figurehead (or champion) to the policy and also, through their conviction, conveys the policy as inescapable – thereby, if cognitive dissonance theory is applicable, bringing support round to the policy.

For many economists the lack of support for road pricing is attributed to an information deficit by those who oppose the scheme, when society as a whole will benefit from the scheme (e.g. Frey, 2003). This point provided the focus of some discussion within the group with the opinion also being expressed that information deficit is not the main motivation for resistance to reform. For example, often those who lead the opposition to policies are very well informed, more so than those who support the policy (e.g. anti-nuclear power station campaigners, see Peters, 2000). The main motivations to resistance it was argued come from status-quo bias, loss aversion, framing and hidden tax bias.

4.2. Acceptability

Public acceptability is a necessary requirement for transport pricing reform to occur and is possibly the single biggest barrier to implementation. The literature and evidence from successful transport pricing reforms suggests that clear objectives are needed for success. A pricing reform may have many objectives, however, Jones (2003) points out that most successful operational schemes (in terms of achieving public support) have emphasised only one objective - either congestion relief or revenue generation

combined with earmarking. Multiple objectives may work against clarity. For sectors which are already heavily taxed (e.g. the roads sector) there is also a deep suspicion that the motivation for the charge is revenue generation for government – unless the charge can be directly linked to specific new infrastructure as in the case of Norway. This suspicion was also a factor that influenced Edinburgh residents' decision to reject congestion charging, as the referendum was set against a backdrop in which the congestion charge in London had been increased by 60% soon after the scheme began operation. The suspicion of the charge as an additional tax, even in the presence of earmarking, can be exacerbated if central government funding for the sector is reduced to offset the income stream from the charge, as pointed out by Richards (2005: p83) regarding the London congestion charge.

It is apparent, and this was evident from discussions within the expert group, that different interest groups see different objectives for a pricing reform with important implications for revenue use. At one end of the scale an objective of a pricing reform is to ensure prices fully reflect costs thereby allowing transport users to make fully informed transport choices. Such a situation maximises economic efficiency. At the other end of the scale an objective of a pricing reform may be purely to raise sufficient revenue to fund the construction of new infrastructure. Intermediary positions also exist in which a transport pricing reform with earmarking is seen as a mechanism for making transport more efficient and for increasing investment in transport infrastructure and services. It is fair to say that different potential objectives appeal to different stakeholder groups. Furthermore it is clear that pricing reform objectives that lead to wholesale price increases with little return to those who pay the charge are not welcomed by users - as would be expected. However, one structural problem which still persists is that while the costs of road pricing are direct, obvious and immediate, the potential benefits derived from use of revenues are delayed, less visible and may not be credible (Marcucci, 2001).

Public acceptability is also closely related to the concept of equity or fairness. If a reform is considered inequitable or unfair it may well be perceived as unacceptable. Two types of equity are referred to in the literature: spatial equity relating to geographical location and social equity relating to socio-economic characteristics. The proposals for congestion charging in Edinburgh are a good example of spatial inequity leading to an unacceptable scheme. One of the factors which contributed towards Edinburgh residents voting against the proposals in a local referendum was that the scheme was considered unfair on residents of local authorities outside of Edinburgh (Laird, Shepherd and Nash, 2007). Issues of fairness can increase the acceptability of a pricing reform as well as detracting from its acceptability. For example, kilometre based HGV charging is considered acceptable in principle by UK haulier associations as it puts UK hauliers on a equal footing with their overseas-based competitors (who do not face the high level of fuel taxation experienced by their UK counterparts). Besides distributional issues of fairness procedural aspects also have to be taken into account in order to ensure public support. It is the fairness of the procedure and the 'way in which' the reform is implemented that has a strong influence on the overall attitude towards a certain policy and the tendency to support a policy. How the impacts are distributed and whether the distribution can be seen as a legitimate or fair distribution of the impacts makes rather little difference for public acceptability (Nelissen, 2002).

EC policy, the Green Paper and White Papers (CEC, 1995; 1998; 2001), have also identified *transparency* as an important ingredient for acceptance. Transparency can be achieved through clarity in objectives, operation and in particular revenue use. The basis for setting prices is one area for which transparency may be required. Therefore a detailed account of how transport prices are related to cost recovery and external costs in general is required to aid transparency. Accounting information is also important for the monitoring of financial viability, equity and budgetary needs for second-best pricing schemes (UNITE, 2003). Transparent accounting also allows the public to assess whether new or higher charges are just another general tax measure.

Public acceptance can only be expected if people have confidence in the effectiveness of the measure, the use of the revenues, the fairness and anonymity of the system. That privacy is not affected and anonymity is guaranteed must be communicated in a credible and convincing way. One precondition to support confidence is transparency of the intended measures at an early stage. Connected to transparency, for the acceptance of any change you have to create some commitment of people to the new ideas, perhaps creating some identification with the proposed package of measures. This commitment depends on early and credible communication, on positive experiences (at least by models), on the conviction that this is an effective solution, and on perceived chances of participation. People want to see themselves as having at least some degree of control over the things they are affected by. Thus there is a connection between participation, commitment, acceptance and later effectiveness. This points out the importance of early information and participation of people even in concept development. A second precondition for creating confidence is defined responsibility. Who will be responsible for the functioning of the system, for charging and accounting, for revenue allocation, for failures and undesired effects? This has to be defined clearly before implementing the system. Responsibility issues are of particular relevance in connection with the debate of privatisation (Schlag and Teubel, 1997).

In many situations citizens consider transport (and roads in particularly) as a basic public service and therefore do not consider transport pricing as a necessary reform. A significant effort may therefore be necessary in order to achieve acceptability from society for a new pricing system. Furthermore, there appears to be low social-political acceptability of marginal social cost pricing (AFFORD, 2001). This is attributed to the fact that the majority of policy-makers are sceptical about marginal social cost principles, and about the applicability of the detailed economic theory underlying marginal social cost pricing. Moreover governments and politicians have to justify their policies in terms of practical arguments and real impacts rather than in abstract concepts of efficiency and equity (AFFORD, 2001). Evidence of a trade-off between efficiency and acceptability is evident in the REVENUE case studies. This adds to the body of evidence suggesting that first best pricing schemes are “unlikely to be practically feasible” (de Palma *et al.*, 2007) and that understandability of pricing is important for acceptability (Bonsall *et al.*, 2004; Hoffmann *et al.*, 2006). To an extent this has been recognised in the EC’s transport pricing policy as the objective of marginal social cost pricing has been replaced by an objective of ‘smarter’ pricing in the latest policy document (CEC, 2006a).

Public acceptability appears to be intrinsically linked to the use of the revenue. Public acceptance of a pricing reform increases if the revenues are spent on projects that people support. (Conversely, acceptance would be expected to decrease if the revenues are spent on unpopular projects, though in this case the advantage of transparency may still win some support).

There have been three main schools of thought about use of revenues. Classically, the view was that application of spending should be kept quite separate: a road pricing authority should set prices according to economic principles, and then spend the funds according to the best available use, with no direct connection. The second view has been that funds should be earmarked for transport spending, either (a) within the same sector, area or mode, or (b) elsewhere in transport, wherever the best transport projects are available. The third view is that any additional charges due to pricing reform should be earmarked to reduce other taxation or charges, so that overall revenue remains constant. These can be combined in different proportions, but of course cannot all be fulfilled at once. In recent years the application of some degree of hypothecation has been the most common recommendation from research on acceptability. In part the reason earmarking increases acceptability is due to the public's mistrust of government motives. For example, surveys carried out in the PRIMA project showed that more citizens would be willing to pay higher charges if revenue raised from transport taxes is used to finance investment in transport than if the revenue was used for some other purpose. Moreover the PATS surveys revealed that people are suspicious about government motives for pricing. People believe that congestion-related problems, for example, are worsened by an inefficient and poorly organised transport system. Therefore they are not willing to pay for congestion charges. On the other hand, they are more likely to accept higher charges if the revenue raised is to be used to reduce pollution or to improve public transport through cross-subsidisation. Charging has more chance of being understood and accepted by users if it results in an improvement in the quality of service offered (PATS, 2001; PRIMA, 2000). Earmarking is of course one answer to addressing mistrust of the government, but alternatives including a more de-regulated transport sector with a 'privatised' decision-making apparatus or an independent transport commission are others. Although it appears that the public is clearly against a privatization of public roads (Schade and Schlag, 2000).

Hypothecation or earmarking does not in itself guarantee public acceptance of a pricing proposal. This is because for individuals and organisations the detail of an earmarking proposal can be unacceptable – particularly when set within the context of cross-subsidisation or cross-financing between modes. For example, surveys undertaken as part of the REVENUE project indicated support for earmarking surplus revenues from the road sector to public transport in Oslo, but also found that hauliers held a strong preference for using surplus revenue from HGV charges in the roads sector (as opposed to cross-financing parallel rail freight schemes). In Switzerland HGV organisations have also opposed the Swiss HGV charge and forced a second national referendum on the existence of the charge. One of the grounds for their objection was the earmarking of revenues from the charge to rail projects (Cretegnny *et al.*, 2005). It would seem likely that private sector operators (e.g. airlines, port authorities) whilst tolerating earmarking of revenue into transport schemes complementary to their operation (e.g. surface access road and rail infrastructure) would oppose cross-financing market

competitors such as high speed rail, in the context of airlines, and competing ports, in the context of port authorities. At a government level there appears to be resistance to the concept of earmarking, as earmarking reduces the government's freedom to determine its budget priorities and also may reduce its fiscal autonomy. Thus the recent HGV charging directive (CEC, 2006b) does not contain an earmarking clause – except where charges exceed total infrastructure costs excluding externalities.

Within the expert group there exists some consensus that, if surplus revenues occur, some form of income transfer (or cross-subsidy) between modes or regions will need to occur. This is because it seems impractical to hypothecate all revenue from transport charges for investment at the location where the revenue was generated. The impracticality stems from the fact that it would be inappropriate to invest revenue in poor projects just because surplus revenue exists and it needs to be spent on something. It is therefore necessary for the decision-maker to have a degree of freedom to choose the investment strategy (mode and location) to ensure worthwhile projects are chosen (i.e. the revenue is used efficiently). Differences, however, exist as to the exact extent of the freedom that should be allowed, as acceptability of revenue use has strong implications for fairness (i.e. equity). Acceptability of the use of revenues generated from the road sector for investment in public transport appears to vary culturally and by the nature of the route (urban/inter-urban). For example, inter-dependence of modes in an urban environment means that cross-financing from road to public transport can be acceptable in that environment. However, there also exists a body of opinion in Europe that considers the revenues raised from the road sector should only be spent on the road sector, though this might be due to a belief that this is the most efficient use in practice rather than a matter of principle. Within that view there is acceptance that there may be strong reasons for the revenues to be invested in regional networks other than the one in which the revenue is raised.

Tied in with revenue use is the issue as to which statutory body should decide how the revenue should be used - which projects should be progressed and which ones should not. The lack of a legal right for a public body to control an aspect of the revenue may lead to acceptability problems (Frey, 2003). In the case of the Edinburgh congestion charging proposals, despite an equitable revenue sharing agreement being proposed by the City of Edinburgh Council, the lack of a legal right to a share of the revenue was one of the reasons that led neighbouring authorities to object to the pricing reform. That case study also emphasised the need to develop proposals on a consensus basis (Laird, Shepherd and Nash, 2007).

There is therefore a substantial body of research that indicates public acceptance of a transport pricing reform is the key barrier preventing implementation. Public acceptance is intrinsically linked to transparency and, importantly, the use of surplus revenues. It is also linked to the simplicity and fairness of the pricing structure. Earmarking of surplus revenues can be controversial – earmarking appears to be needed for public acceptance as it can alleviate mis-trust of the government, but earmarking may be unpalatable for certain users and operators if it is also associated with cross-subsidisation or cross-financing of other infrastructure from which they derive no benefit. Linked to the decision to earmark is the decision as to who should have control of the surplus revenues. If an organisation (government or private) has no legal basis in

which to participate in the revenue distribution process (for revenues that they or their residents have contributed towards) this may cause acceptability problems. As de Palma *et al.* (2007) conclude:

....transport charging can be both efficient and politically feasible only if accompanied by a revenue-use plan and an information/marketing campaign that meet five conditions....

- (a) goals are worth pursuing;
- (b) a design can achieve the goals
- (c) advantages over (at least complementarity with) other measures;
- (d) a clear and credible explanation of how the scheme impacts major stakeholder groups; and
- (e) a clear and credible explanation of why these impacts are beneficial.

4.3. Implementation paths

Implementation paths for (or the phasing in of) pricing reforms are necessary for a number of reasons. For example there will be logistical difficulties associated with equipping the national vehicle fleet with payment/tracking devices. Phasing by vehicle type (e.g. HGVs first), by road type (e.g. motorways first), or by region (e.g. cities first), may therefore be necessary. This will allow problems with the technology and other 'teething' issues to be identified before a scheme is rolled out nationally or internationally. However, such phased implementation schemes create complex challenges for the pricing structure during implementation. This is because to maximise efficiency different second best prices in each phase will be required that take cognisance of both other transport prices (outside the area directly affected by the pricing reform) and prices in other economic sectors. Verheof *et al.* (2008), reporting research undertaken in the MC-ICAM project, use the concepts of constraints and barriers to help define an implementation path. Constraints exist on the:

- coverage or scope of the pricing system (e.g. geographical, modes, user groups, externalities);
- composition and level of pricing measures (e.g. can fuel tax and distance based charging be levied concurrently);
- differentiation of prices (e.g. by time of day, mode, vehicle type);
- rules and principles covering revenue use (need for cross-subsidisation); and
- use of non-price measures (e.g. regulation on emission standards).

The constraints exist because of barriers. These barriers can be categorised as:

- Technological and practicable;
- Legal and institutional (e.g. right to freedom of movement, discrimination, etc.); and
- Acceptability.

The barriers represent underlying factors that cause the constraints to exist, and therefore hinder the implementation of efficient pricing. As the barriers are not typically set in stone, but can in fact be eased given sufficient time and effort, an implementation path can be constructed. This leads to the idea of defining an optimal implementation path as a sequence of constrained optima. In the MC-ICAM project the implementation paths in the case studies were designed to reflect the gradual removal of technological barriers and legal and institutional barriers. For example, the implementation path of the Paris case study was firstly the imposition of tolls on a few links, then an expansion of the number of links tolled, then a replacement of the tolls with a cordon charge and finally a replacement of the cordon charge with a distance based charge. Acceptability barriers were not considered in the design of the implementation path.

Constraints may also exist along the implementation path. For example, it can be shown that if only HGVs are charged for road use the optimum price (for the HGV) is higher than if all vehicles are charged for using the road (Niskanen and Nash, 2004). This is because in the absence of charging passenger cars for road use there is too much congestion. Clearly this would be unacceptable for HGV operators, and might lead to adjustments which overshoot the final optimum. In such a situation it might be necessary to have a price cap on HGV charges. Capping HGV charges to average cost can also be viewed as one of a sequence of constrained optima.

Potentially the implementation path may affect the final pricing strategy that is achievable – that is some path dependency may exist. This is because some barriers will never be removed and the initial phases of the strategy may lead to the creation of new barriers that cannot be ameliorated. In Rome, for example, following the enforcement of the Limited Traffic Zone there has been a substantial increase in powered two wheelers. The large number of powered two wheelers is perceived as a problem. Potentially the shift to powered two wheelers may reflect a cultural shift in behaviour, thereby creating new barriers, which may constrain a future transport strategy. More significant barriers may also be created along the implementation path through changes in land use patterns, investment in new infrastructure, or anything with significant sunk costs (Verheof *et al.*, 2008). For example in the Helsinki and Oslo urban case studies of the MC-ICAM project Verheof *et al.* report that reverses in land use patterns occurred with shifts from one phase of the implementation path to the other. Given the significant sunk costs associated with investment in land there is not only a long lag for land uses to re-adjust to the final pricing strategy (thus delaying the point in time when the full benefits of the pricing reform are realised), but it could be imagined that the presence of such sunk costs would generate a degree of resistance by the public to subsequent phases of the implementation path, thereby endangering the success of the reform.

Existing pricing schemes such as the Hungarian motorway tolling situation and the Austrian ASFINAG involve tight earmarking. However is such tight earmarking a consequence of the implementation path – i.e. introducing pricing on one mode and one section of the network at one time? Would a different earmarking regime have been adopted if charging had been introduced on a much larger part of the network? Might pricing the high quality elements of a network result in embedding the attitude that poor

quality (e.g. congested networks) should be free – which gives the opposite signal to optimal pricing and may make it more difficult to introduce such a pricing strategy. It is therefore important to understand whether the constrained optima along the implementation path generate path dependency and allow the desired final pricing strategy to be implemented. Aside from the MC-ICAM project there has been very little research undertaken in this area and the discussion within the group indicated that a ‘general’ implementation path for a pricing reform may not exist. This is because barriers will vary geographically and culturally. It might therefore be expected that implementation paths will vary by country and locality, though without further research this is speculation. The group were not aware of any ongoing research in this area.

4.4. New member states

Generally revenues from the road sector are significant elements of the State Budget, even allowing for the fact that it is common in NMS for a proportion of fuel excise duties to be earmarked. These revenues allow politicians to finance other social systems whose operation is generally loss making. The protection of these revenues by politicians may therefore act as a barrier to further earmarking required to achieve acceptance of a reform.

The continuous growth of GDP in new member states makes it possible, but also necessary for certain sectors to proceed with fiscal and administrative reforms. A general objective of politicians and inhabitants is that after the reform processes the new systems shall be based on social fairness and equity – this underlines the need for pricing reform in the future, and may make reform in NMS easier to implement than in pre-2004 member states. Saying that there are currently no proposals or plans within NMS to investigate the concepts of a reformed pricing system (including for example using fuel excise duty to finance the damages incurred from the greenhouse effects of transport). Furthermore the GRACE project found that there are shortcomings in the transport accounting system in NMS (Link *et al.*, 2007). If there are no detailed cost databases and links between sectoral transport performances and incurred social costs, there is no evidence upon which to base a pricing reform. This leads to resistance to pricing reform from both a social and political side. The theory of hidden tax bias and status quo bias (see §4.1) is also relevant in NMS, in that people do not protest against existing pricing systems (like fuel excise duty or motorway charges), but worry about reforms which – they fear – generally mean further financial burdens.

The lower purchasing power of NMS citizens has led stakeholders to set sub-optimal user prices (tolls) on the road network. This strategy has two important consequences: road investments are generally loss making from the fiscal point of view and foreign users with higher purchasing power have comparative benefits when using these networks. In the case of an indirect tolling system like a vignette system this statement has great significance. When looking at, for example, Hungarian survey results, 31% of traffic kilometres are generated by foreign vehicles but only 27% of the incomes in the existing vignette system (Siposs, 2007). The average cost of a transit trip for a foreign user is lower than average trip cost for a domestic one. This means that there is a quasi continuous cross-subsidisation from domestic to foreign users. The planned mileage based tolling system would lower the deviation from the equilibrium point (no cross-

subsidisation), but it would increase the financial burdens of all users. There is no legal basis upon which any kind of price discrimination on social or national level can be applied. If politicians wish to take domestic interests into account, they therefore have to re-think the existing national taxation system.

Although congestion is not a significant problem yet, preparing a strategy for managing congestion is needed in the near future. In larger cities (like Budapest) there are tendencies to prepare congestion management systems but mainly at a political level. This has been led by financial (profit) motives. Using price as a means of managing congestion lies at low priority level in NMS. The strong pressure for and support for pricing initiatives needed to implement a pricing reform is absent in NMS.

Due to the absence of detailed pricing reform strategies in NMS, there are no related survey results on acceptability/acceptance of reform plans. The only data available relates to the implementation of mileage based road user charges (based on average cost prices). Potential private users welcome the proposed mileage based system in Hungary. Two thirds of them have been already informed of motivation and possible changes. If they could choose between the existing indirect tolling and the planned direct tolling, most of them would choose the direct one (UKIG, 2006). Business users (goods vehicles, buses) also accept the new system, although the existing vignette system offers more beneficial specific toll rates. They think, that if they can participate in preparatory steps and their main needs will be integrated into the process, the implementation will be successful (TNS, 2006).

Earmarking seems to be a fair and accepted solution in NMS, if surplus revenues are used within the specific sector. For example, in Hungary there is a strong public acceptance of motorway charges as the revenues are earmarked. Controversially other non-earmarked revenues can be used for financing non-profitable social sectors – as is commonly favoured by politicians.

In terms of the implementation process “*politicians have to decide about the form of the implementation process. It is in general a decision between a “big-bang” without any transition time vs. “gradualism”, which means e.g. a reform in several steps over time*” (Seidel *et al.*, 2004). In case of pricing reform both options are available, with the choice between them depending on transparency of measures and scale of impacts. It is important to note that with both implementation paths there is a need to present gains for the society as a whole (private, commercial users and non-motorised inhabitants). Removing barriers to implementation is as important in NMS as in pre-2004 member states. All categories of barriers (technological and practicable, legal and institutional, acceptability) need well-planned preparatory steps and thorough financial frames to overcome them. Currently such steps are absent in NMS, and these barriers are therefore significant. Elaborating mid-term and long-term strategies could contribute to the design of proper solutions – though this mainly depends on political consensus (Tanczos and Bokor, 2004b).

5. Institutional context

5.1. Pricing principles

There exists some consensus within the group that pricing and financing schemes should be developed for whole networks and not for single links (e.g. an isolated toll road) and that they should be forward looking. This is as implemented in the German HGV charging framework (Rothengatter, 2007). A forward looking system considers the dependency of costs on future traffic flows. By developing the scheme for a complete network it is possible to account for interactions between the different components of the network – that is how changes in one part of the network affect other parts. What of course is less certain is what constitutes a single network – is it single or multi-modal? Some members of the group preferred single mode networks, whilst it was thought that within the context of a European infrastructure fund the Commission would be looking for a multi-modal fund. At a national level, within an inter-urban environment and an environment in which the different modes are de-regulated to different degrees it was, however, felt that the networks used for costing purposes would need to be single modal.

In determining the pricing rules that should be adopted the main considerations are:

- How to give appropriate incentives to transport vehicle operators (and subsidy to providers) regarding how many trips to make and where and when to make them;
- How to give appropriate incentives to infrastructure managers regarding expansion or contraction of capacity;
- How to promote competition;
- How to finance infrastructure; and
- How to design a system that is acceptable.

The main pricing rule alternatives are long run marginal social cost pricing (LRMSC), short run marginal social cost pricing (SRMSC) and average social cost pricing (ASC). Unfortunately none of these pricing systems perfectly addresses all these considerations. Any decision about pricing therefore has to be a trade off between them.

Long run marginal social cost pricing (LRMSC)

Long run marginal social cost pricing involves charging all the costs that arise from a small increment in traffic when capacity is optimally adjusted. It therefore includes the cost of that additional capacity, but not additional congestion to the extent that the extra capacity offsets this. Pricing according to this rule encourages appropriate investment and provides non discriminatory access, but may price off trips willing to pay their short run marginal cost, fail to ration space (leaving serious congestion problems) and fail to cover total cost. It is also difficult to measure due to the existence of stepped cost functions for infrastructure with major indivisibilities (as additional lanes or tracks are provided) and the problem of allocating costs over asset lives and times of day.

Short run marginal social cost pricing (SRMSC)

Short run marginal social cost pricing involves charging all the additional costs caused by a small increment in traffic when capacity is unchanged. This includes marginal congestion costs but no costs of providing additional capacity. Pricing according to this rule encourages efficient use of existing infrastructure and provides non discriminatory access, but may give wrong incentives to infrastructure managers and fail to cover total cost. SRMSC includes, for scheduled modes, opportunity cost of capacity in its next best use. This is difficult to estimate – auctions are often advocated, but a more practical alternative is estimation by means of cost benefit analysis.

Average social cost pricing (ASC)

Average social cost pricing recovers cost and provides non discriminatory access. The one key advantage of ASC pricing is that it is in the main transparent and easily understood by the public. Revenues balance costs, no large revenue surpluses are generated and there is no need for public subsidy. Countering that are the disadvantages that under ASC pricing, trips willing to pay marginal social cost may be priced off the network and there will be failure to ration capacity (leaving serious congestion problems). Also there is an element of arbitrariness about joint cost allocation which can reduce the transparency of the prices.

A weakness of both LRMSC and SRMSC pricing compared to ASC pricing is that infrastructure costs may not be recovered under MSC pricing. If a higher level of cost coverage is desired then second best prices can be adopted. By adding mark ups to the MSC price any desired feasible level of cost coverage can be achieved. Such mark ups will have least impact on traffic and benefits if they are inversely related to the price sensitivity of the traffic or market segment in question, and hence are preferable, in efficiency terms, to average cost pricing. As discussed in Chapter 3, in practice, it appears that SRMSC pricing would more than cover the total costs of the transport system in most countries, with a surplus on roads offsetting a deficit on rail. There is an issue as to what to do with surplus revenue if costs are more than covered. Again as discussed in Chapter 3 the most efficient use would be to reduce distorting taxes, but this may be unacceptable and some other use within the transport sector may be necessary for the approach to be adopted.

If capacity is expanded appropriately in accordance with demand, then ignoring indivisibilities, SRMSC always equals LRMSC. Otherwise a choice between the two has to be made. Where demand adjusts rapidly and capacity slowly, it will be most important to give signals which optimise use of existing capacity, SRMSC will be favoured. The more lagged adjustments in demand are, and the more rapidly capacity adjusts, the more LRMSC will be favoured. Where the addition of indivisible chunks of capacity leads to violent fluctuations in SRMSC, and users respond with a lag, there is a case for smoothing these fluctuations to give signals as to what costs will be in the longer term even if SRMSC is the pricing principle adopted.

A particular concern with SRMSC pricing is the incentive it gives infrastructure managers to limit capacity and push up price to maximise surplus revenues. If infrastructure managers are taking decisions on the basis of cost-benefit analysis rather than financial considerations, then there need be no concern that SRMSC pricing

distorts investment decisions. Otherwise another form of regulation may be necessary. Two particular measures have been adopted in European legislation to prevent infrastructure managers from artificially restricting capacity to raise price.

- The Eurovignette Directive contains a cap on average congestion charges at average infrastructure cost (to give correct incentives this should be long run marginal infrastructure cost including external costs of infrastructure provision).
- The rail access charges Directive contains a requirement for infrastructure managers who are levying scarcity charges to produce capacity enhancement plans, or to show why – in cost-benefit analysis terms – capacity enhancement is not worthwhile.

So there is no ideal set of pricing rules that meets all the considerations outlined earlier. LRMSC pricing is most appropriate where capacity is, or can be, readily adjusted to demand. SRMSC pricing or SRMSC based pricing (with mark ups, smoothing and/or caps) is best where there are major indivisibilities and/or long time lags in adjusting capacity. ASC pricing is easiest to explain to the public and also will not generate large surpluses or deficits. The rationale for generating large surpluses or creating large deficits can be difficult to explain to the public. On the downside ASC pricing always has a degree of arbitrariness associated with it and always involves loss of economic efficiency (unless ASC equals LRMSC or SRMSC). Modelling exercises such as that undertaken in the MC-ICAM project (Niskanen and Nash, 2004) generally find that from an efficiency perspective the status quo to be preferred to a pricing reform that led to the adoption of average cost pricing.

Some discussion centred on the form of the pricing-costing system and the appropriateness of long-run average cost pricing, as used in Germany, compared to short run marginal cost pricing. Long run average cost pricing had an intuitive appeal to sections of the group. However, as outlined above one of the problems with such an approach is the allocation of capacity costs, as prices are low where traffic volumes are high and high when volumes are low. Such a pricing strategy could therefore lead to prices in the peak being lower than in the off-peak, which would send the wrong signals to both the users of the transport network but also to the infrastructure operator - who should be encouraged to expand capacity where infrastructure is congested. It was suggested that where the use of capacity needed to be optimised this could be done through the use of differentiated ‘congestion-related’ charges, whereas the internalisation of externalities (namely safety and environmental externalities) could be addressed either through regulation (e.g. carbon trading, safety and emission standards) or through differentiated charges. If prices are too high on low trafficked sections of the network (or on entire regional/modal networks) a subsidy from central government can be used to lower the price. It was also suggested that it would be possible to include safety and environmental externalities into the German cost allocation process and therefore the price faced by transport users.

As one of the difficulties with marginal cost based pricing is that it is difficult for politicians to put across how the reform will impact on transport users, an interesting question arises as to what exactly the differences are in prices between a costing system based on second best marginal cost prices (with mark-ups to recover investment costs) and one based on long-run average costs with top-up congestion charges and subsidies

in low trafficked parts of the network. Will there be a material difference in the prices faced by users? Or is it just a case of presentation?

5.2. Role of an infrastructure agency

Existing infrastructure agencies in Europe have only limited powers: usually they are neither responsible for determining prices nor for selecting projects for investment (Proost *et al.*, 2006; Rothengatter, 2007; Suter, 2007, Becker, 2007). Within a pricing reform a role for an infrastructure agency at both national and EU levels could be envisaged. Discussion within the group therefore focused on the range of powers that agencies could or should have and whether the agency should be a private sector enterprise or part of the public sector.

Allowing the agency to be responsible for investment decisions could de-politicise the investment process allowing objective decisions to be made. However, transport investment is a political issue and it seems unrealistic that it will be possible to completely divorce politicians from involvement in the debate surrounding transport infrastructure decisions. Furthermore, any set of investment objectives and rules that could be developed for an agency to use will be imperfect, particularly in the treatment of externalities and non-tangibles (e.g. some environmental goods). However, where an agency might be quite effective at making investment decisions is in prioritising a series of projects that constitute a strategy. The choice of strategy and decisions on major projects will, however, always remain political.

Whilst a role for national infrastructure agencies could be seen, there was some uncertainty regarding the role of a European multi-modal infrastructure agency, or even a single mode European infrastructure agency particularly in relation to project selection. Primarily this is due to the principle of subsidiarity, whereby the decision-making framework should be undertaken at as local a level as possible. In fact following an evaluation of the US FHTF⁴ Proost *et al.* (2006) advise against a European agency dictating project selection to member states as this can promote conflict. The role of a European infrastructure agency would therefore be confined to co-ordination and co-funding. Proost *et al.* (2006) make the following suggestions for the remit for a European agency:

⁴ The Federal Highway Trust Fund (FHTF) in the US founded in 1956 is possibly the longest running infrastructure fund. Initially it was covered by earmarking 3 cents per gallon of fuel tax. Its funding is still predominantly fuel tax based, though the level of the charge now varies by fuel type, and also includes heavy vehicle related charges. Initially set up to fund the completion of the inter-state highways the fund now finances a broader range of projects – in 2002 only 19% of funds were directed to inter-state highway projects (GAO, 2004, cited in Proost *et al.* 2006). A high degree of political influence has been in evidence over the manner that funds are allocated between states and to specific projects. Such influence reduces the transparency and possibly the effectiveness of the fund and has evolved during the lifetime of the fund (see Proost *et al.* for a review of the fund).

- co-ordination of evaluation procedures (for estimating benefits);
- co-ordination of technical standards to safeguard against technical incompatibility;
- only co-funding projects that have non-local (i.e. trans-national benefits), with the level of funding tied into the share of non-local benefits (X);

Stable funding arrangements for such a European infrastructure agency would also be needed. Given that the EC cannot levy taxes or charges this funding must come from the Member States directly or the general EC budget. Proost *et al.* suggest direct funding from Member States with the ability of Member States to withdraw from the agency. Proost *et al.* also emphasise that the EU has no comparative advantage in sharing the risks of the project, and given information asymmetries will end up co-funding risky projects. A European infrastructure agency should therefore be restricted to providing small upfront subsidies rather than risky loans. A further role that a European infrastructure agency could take on would be to co-ordinate prices if charges are levied on the transport sector. This is because as discussed in Chapter 3 competition for tax revenue between member states can lead to charges being set too high and investment rates too low.

It was considered by some at the meeting that the private sector is better at management and that as management of the network is the most significant task of an infrastructure agency it should be in private hands. Other arguments for the agency to be a private enterprise include: revenue from transport user charges and their investment in new infrastructure is excluded from the public balance sheet and the agency can borrow money from the financial markets – both of which free the government from public sector borrowing constraints that may restrict investment policy. However, for the agency to be a private enterprise important questions need to be answered: who would regulate the agency and ensure pricing, investment and maintenance strategies are fair? What is the regulatory model: would it be one based on price (e.g. RPI-X), or one based on level of service, or a mixture? How would the agency be incentivised to invest in new infrastructure?

Potentially if the transport market was fully de-regulated then prices would not need to be imposed centrally but would be decided by the market. Under the principle of subsidiarity the decision-making for the de-regulated networks would be undertaken at a local or regional level. Given the likelihood that natural monopolies will occur however there will be need for a regulator in such an environment. The point then arises as to how extensive a role the regulator should have in determining prices and investment decisions and in safeguarding the situations where the public good aspect of transport networks will be important, such as rural areas.

5.3. Regulation

The importance of regulation in an environment where an infrastructure manager sets prices and determines investment strategies cannot be overstated. It is also clear that there is an important role for a regulator within either a short run marginal cost based or long run average cost based price setting system. Primarily this is due to the potential

use of mark-ups in both systems, but it is also needed to ensure the cost allocation process between vehicle types, infrastructure types, time periods, etc. is transparent and fair. An additional but very important role for a regulator would be to ensure that appropriate investment in new transport infrastructure occurs. The type of regulation required, however, will be determined by the role of the infrastructure agency and whether it is public or private sector. Furthermore, and as set out above a lot of questions remain unanswered about the form and type of regulation that would be required.

5.4. New member states

The current evidence on pricing methods shows that direct infrastructure tolling and indirect taxes (vehicle tax, fuel excise duty) are commonly applied in NMS: while road tolls are in force on selected parts of road network, all vehicles are subject to indirect taxes. Fuel tax incomes are generally earmarked (in variable percent) for infrastructure funds (except in Hungary), but revenues from vehicle taxes either go to State Budget or Road Fund or to local/municipal budgets. In CEEC direct toll revenues are dominantly or fully earmarked to finance the related road sections. Earmarking has growing significance at the point of administrative reform. For example, latest concept on road financing in Hungary is that operation and maintenance (O&M) of the primary road network shall be financed from a central road fund and O&M of secondary roads shall be financed from regional budgets (GKM, 2007).

While the average purchasing power of national users is significantly lower than in the pre-2004 member states, the incurred costs of infrastructure development, operation and maintenance are converging to the international level. As a consequence, national stakeholders prefer to apply price-caps in setting road tolls rather than setting tolls to recover incurred costs, with any deficit covered by the state budget. Prices in such systems are based on average cost calculations. The main reason for avoiding marginal cost based pricing seems to be insufficient cost accounting data in NMS. There are a lot of estimations on the characteristics of current expenses or incurred external costs in transport sector, but almost no methodologically valid background underpinning them. Another important issue is the relatively high level of fixed costs in infrastructure operation (especially in the rail sector): the use of MSC based pricing principles therefore leads to under-financing problems in the rail sector (see Tanczos *et al.*, 2006). Last but not least decision makers wish to make the tariff structure as simple as possible to achieve public acceptance which is difficult with an MSC based pricing system.

Setting tariff levels is based on various motives in NMS, with the dominant one being financial. The reason for this is that current networks are operating with spare capacity – capacity-optimal tariffs are lower compared to the current tariffs. If the remaining spare capacity is exhausted, decision makers will need to revise current pricing policies. Other motives also exist based on aims of specific national transport strategies (e.g. preferring large capacity non-rural routes instead of rural crossing routes) (Tanczos and Bokor, 2004a).

There are various and dispersed road administration structures in NMS. Initiatives to set up an infrastructure agency are outlined by PPP projects. If these initiatives will turn into realisation, they will have only limited rights, with no responsibility for setting prices, no opportunity to choose additional sections to be built. A multi-modal concept in decision preparation process is figured in Hungary: the Coordination Centre for Transport Development is responsible for managing the Road Fund and all infrastructure projects and supports decision makers in selection of projects to be realised. The top level of decision making process (one and all the relating Ministry) will henceforward decide on these issues, the system remains centralised. No general or substantial changes are envisaged in the near future.

6. Recommendations for the adoption of pricing reforms

6.1. Expert group objectives

6.1.1. *How can sufficient funds be raised to meet the desire to construct new infrastructure?*

Tax and price revenues from the transport sector are greater than the costs of operation of the existing transport network and its enhancement. In principle therefore two avenues of infrastructure funding are available: the re-direction of more transport taxation from the general government budget back to the transport sector or an infrastructure charge that is additional to current revenues. Both may be implemented either in the present structure of prices and taxes, or with new charges that replace the present structure partially or fully.

Redirection of existing tax revenues to the transport sector implies either cutting other areas of government spending or increasing other taxes. The evidence of projects such as FUNDING is that the transport sector is a relatively efficient sector in which to raise revenues, whether by differentiated road user charges or by fuel tax. *Therefore we think it likely that if increased levels of transport infrastructure spending are required, then additional revenue will need to be raised in the transport sector.* This is conclusion 1. There is not a consensus for this conclusion within the group as some members consider that *all* transport taxation should be returned to the transport sector before additional transport charges are considered. There is also a strong argument that use of revenues should be transparent, and this point is returned to in later conclusions.

Conclusion 1 Transport taxation is an important source of revenue for governments to meet social, economic and environmental objectives in sectors other than transport; therefore it is likely that if increased spending on transport infrastructure is desired, some increased revenue from the transport sector will need to be sought. However charges for meeting the costs of the transport sector should be clearly distinguished from those for general revenue purposes, and revenue use should be transparent

A transport pricing scheme might be seen as a solution to any shortfall in funding from the state budget. A reform in transport prices can provoke strong resistance from fairness, economic and behavioural perspectives. As such the public needs to be convinced that a reform is the best solution to the existing transport infrastructure problems – i.e. alternative measures are not sufficient. The implication of this is that whilst there may be a desire to build new infrastructure by policymakers, unless there are convincing reasons that this infrastructure is absolutely the best solution, and a pricing reform is necessary to fund it, there will be resistance from the public. Furthermore the evidence indicates that transport pricing reform needs to be part of a package of transport policy instruments. This leads to conclusion 2. The detail of the

package will need to consider revenue allocation, provision of alternative methods of travel and fairness all of which are the subject of further conclusions below.

Conclusion 2 A new transport pricing scheme should be introduced as part of a package of transport policy measures which is sensible and attractive in its own terms; the pricing element needs to be shown to be a necessary part of the package, and the best available solution to transport related problems.

Pricing principles need to provide the correct incentives for both the users and operators of the transport system as well as being perceived as fair. This is the subject of conclusion 3. Marginal social cost (MSC) pricing (either long run or short run) is the most efficient form of pricing. Consensus does not however exist within the group regarding the appropriateness of marginal social cost pricing principles as the basis of a transport pricing reform. This is because for some stakeholders the existence of large surpluses of revenue from the road network, as occur for parts of the network subject to congestion if MSC pricing is adopted, are symptomatic of overcharging. Similarly the existence of large deficits on, for example rail infrastructure, is symptomatic of undercharging. Such stakeholders often advocate tying total revenues to total costs – i.e. they advocate a form of average social cost pricing. Modelling work shows that such a pricing strategy is highly inefficient and the *status quo* is in fact preferable to such a charging regime.

Conclusion 3 A transport pricing reform should use prices based on short run marginal social cost (SRMSC) for infrastructure where it is difficult to quickly adjust capacity to match demand (such as roads, rail and inland waterways) and long run marginal social cost (LRMSC) where it is relatively easy to adjust capacity (e.g. terminal capacity at ports).

A particular concern with SRMSC pricing is the incentive it gives infrastructure managers to artificially limit capacity and push up price to maximise surplus revenues. Some form of regulation therefore needs to be imposed on infrastructure managers that might include both price caps and investment plans based on cost-benefit analysis rather than financial considerations. This leads to conclusion 4. Further comment on regulation of infrastructure managers is set out in later conclusions.

Conclusion 4 Some form of regulation of infrastructure managers is likely to be necessary to ensure that they do not abuse monopoly power through excessive prices and inadequate investment, or select projects on too narrow criteria. This may include price caps and scrutiny of investment programmes based on cost benefit analysis.

The group has a view that transport users whilst aware of existing prices are not aware of the costs of using the transport system (either the average social costs or the short or long run marginal costs). That is not to say that transport users are ignorant. They understand value for money and have opinions about surpluses and deficits in relation to the prices they face for using a service. These understandings can therefore form the basis of a preference for a certain type of pricing. Given that MSC pricing can mean paying more for a worse service and can result in the creation of large surpluses, which

in other sectors are often associated with monopolistic markets, MSC pricing provokes resistance. Evidence of this is found in the expert group itself, but it is also widespread in the general public. Average social cost pricing, as implemented in the German HGV kilometre based charge, does not generate surpluses. Such a pricing strategy in conjunction with top-up congestion charges and subsidies for parts of the network with low traffic levels may prove a reasonably efficient and acceptable alternative to MSC charging. Without evidence this is however conjecture. This leads to conclusions 5 and 6.

Conclusion 5 It is essential to continue explanation and education that external costs of congestion and environmental damage are just as real burdens on economies as the traditional costs of labour, materials, etc.

Conclusion 6 Research is needed to understand if there is a material difference in the charges derived from LRMSC or SRMSC pricing (with mark-ups, caps and smoothing) and charges derived from average social cost based pricing (with top-up congestion charges and low traffic subsidies).

6.1.2. *If a decision is taken to raise more money from users than would be implied by first best pricing how may this most efficiently be done?*

There exist three specific circumstances where prices may need to depart from either LRMSC or SRMSC for practical reasons. Firstly, under both LRMSC and SRMSC pricing, infrastructure costs may not be recovered. If a higher level of cost coverage is desired then second best prices can be adopted. By adding mark ups to the MSC price any desired feasible level of cost coverage can be achieved, though research indicates that a high level of cost recovery for modes with high sunk costs is expensive in welfare terms. Such mark ups will have least impact on traffic and benefits if they are inversely related to the price sensitivity of the traffic or market segment in question. For infrastructure subject to short run marginal social cost (SRMSC) pricing (e.g. road, rail and inland waterways) the addition of indivisible chunks of capacity can lead to violent fluctuations in SRMSC over time and there therefore exists a case for smoothing these fluctuations to what SRMSC prices will be in the longer term. Finally the costs and complexity of a pure marginal social cost pricing scheme may not be worth the benefits it brings.

Conclusion 7 Prices may need to depart from either SRMSC or LRMSC in three situations. To improve cost recovery a mark-up inversely related to the price sensitivity of the traffic or market segment in question may need to be added. To ensure SRMSC prices do not fluctuate wildly as new capacity is added to the system some smoothing of the SRMSC price may be necessary. And where the costs and complexity of a true marginal social cost pricing scheme are not worth the benefits it brings a departure may also be necessary.

Transport networks are often defined by mode, standard and region (e.g. motorway network, local road network, rail network, air network, national network, TEN-T network, etc.). The management of these networks is often separated. Conversely the

demand for the use of each of these networks is inter-dependent. Pricing for these networks should also therefore be inter-dependent, in the sense that common principles for pricing should be adopted across all networks and prices on one part of the network should be set taking into account prices elsewhere in the network. This is more efficient than adopting one pricing strategy for one network and another for a different network. It is also fairer. This leads to conclusions 8 and 9.

Conclusion 8 Pricing and financing schemes should be developed for whole networks. Developing a scheme for multi-modal networks will be superior in efficiency terms to developing separate schemes for each modal network.

Conclusion 9 There are efficiency advantages to ensuring the same guiding principles to infrastructure prices are applied across networks and across Europe. This is not the same as a harmonisation of prices; as where costs vary, there is a *prima facie* case that charges should also vary.

6.1.3. *If a pricing reform actually raises a surplus for, or from, the mode or area in question how may this be spent to promote efficiency, equity and acceptability?*

If surplus revenues occur on a particular mode or at a particular location, some form of income transfer between regions, modes and class of user has to occur. Revenue can either be used to fund transport infrastructure and service investments or could contribute to the governments' budget and assist in the reduction of say labour taxes. The evidence indicates that a lack of trust in the motives of government mean that part of the revenue will need to be earmarked to the transport sector to make pricing reform acceptable, though in fact modelling work suggest that the most efficient solution is to use the revenue to reduce labour taxes.

With respect to the surplus revenue earmarked for the transport sector it is highly unlikely to make sense to return the surpluses as capacity enhancements (either in infrastructure or services) to exactly the same location and mode as where the revenue was collected. Whilst the group are in agreement with this principle, there is no consensus regarding the detail of income transfer that should take place. Five broad perspectives are identifiable:

- The revenue should be invested in the best performing transport project irrespective of mode or region;
- The revenue should be invested in projects that reduce the external costs of transport;
- The revenue should stay within a mode but can be invested in a different region from the one in which it was raised;
- The revenue can be invested in a different region or mode but needs to be in the same corridor as the one in which it was raised; and
- The revenue can be invested in different modes but must remain within a region.

These differing perspectives on the use of surplus revenue form a barrier to the implementation of a pricing reform. From an economic efficiency perspective there should be no restrictions on how the surplus revenue is invested. The money should be spent where it produces best value. The overall position is summarised in conclusion 10.

Conclusion 10 Transparent earmarking of some of the infrastructure charge revenues to the transport sector will be necessary to achieve acceptability. Some form of income transfer (cross-subsidy) between regions, modes and class of user will certainly occur for practical reasons, and may be chosen in order to optimise overall benefits. There exist a wide range of opinions regarding the exact form of this income transfer making it difficult to achieve consensus; compromises as part of specific reforms will need to be sought.

There is a consensus within the group that surplus revenue should only be earmarked to good transport projects that solve recognized transport problems, have a positive cost benefit analysis as well as meeting environmental and equity criteria. The need to ensure that investment strategies are supported by cost benefit analysis is an important component of the regulation of the infrastructure manager (see the discussion associated with conclusion 4). In part some of the resistance to the earmarking of surplus revenue to modes and regions other than the ones in which the revenue is generated is due to the suspicion that it will be used to fund poor transport projects. There is further consensus within the group that revenue allocations must be transparent, publicly reported and subject to scrutiny, regulation and challenge. This view is set out in conclusion 11.

Conclusion 11 All investments made using revenues from charges must meet criteria of efficiency, environmental impact, and equity. These allocations should be transparent, publicly reported, and subject to scrutiny, regulation and challenge by adequate political institutions.

Well-run infrastructure agencies responsible for collecting, financing and procuring new infrastructure could have advantages in terms of efficiency and acceptability compared to the state provision of such functions. Efficiency in the economy can be improved if transport projects are funded by transport users through an independent or arms length infrastructure agency – even if the charge faced by the transport users exceeds first best prices. This is because such an agency would be less susceptible to political interference in day to day matters. Acceptability of a pricing reform is also improved by the earmarking of the revenues raised from the charge, if the specific earmarking chosen is itself popular. Furthermore in terms of project selection transparency is ensured as the agency would follow a clear set of rules. On the other hand, powerful, rich, agencies set up with an ambiguous role between the state and the private sector can also have their own problems of accountability and the efficient use of funds.

Existing infrastructure agencies within Europe have limited powers. They are neither responsible for setting prices nor for selecting projects. Giving an agency powers to select projects would take the political dimensions of the investment process away from politicians and internalise it within the agency. Saying that, the political nature surrounding transport infrastructure decisions makes it unrealistic to take them

completely outside democratic or political processes, particularly given that any set of investment rules an agency could use will be incomplete, for instance in dealing with the particular peculiarities or location specific externalities that individual projects may have. If the agency has only jurisdiction over a single mode, interactions with other modes will have to be considered elsewhere. Even if it is multi-mode there will be interactions with wider considerations, including other sectors of the economy, the regulation of carbon, regional development, land use planning, and welfare objectives. Thus whilst the choice of strategy and decisions on major projects will always remain political, an agency could be quite effective at making investment decisions such as prioritising a series of projects that constitute a strategy. The UK government for example is, following recommendations of the Eddington study, proceeding to set up an infrastructure planning agency that would make planning decisions on specific projects. These would be made within the framework of government policy statements, albeit sometimes those ‘policy statements’ might include a policy to implement a specific project. This position is summarised in conclusion 12, though it should be noted that some members of the group consider that all infrastructure planning should be divorced from the political process.

Conclusion 12 Independent or arms length transport infrastructure agencies, receiving the surplus revenue from the infrastructure charges, may be more effective than government departments at managing the transport network and making investment decisions such as prioritising a series of projects that constitute a strategy. Objectives, strategies and decisions on major projects will always remain political and should be excluded from the role of such agencies. The decision rules and formal objectives set for such agencies must be simple and transparent enough to be usable, but great care must be taken to ensure that they contribute to, rather than undermining, the wider objectives of government.

Evidence from the US indicates that a European infrastructure agency would be vulnerable to ‘pork barrel politics’ in that lobbying for funds for local projects will be intense. Similarly a European agency would be vulnerable to funding the most risky projects as the EU has no comparative advantage in the sharing of risks. Under the principle of subsidiarity a European agency need have no involvement in project selection, which should be left to member states. Under this approach, it would follow that the role of a European agency would be confined to paying grants to national governments on the basis of clearly defined criteria (underpinned by a form of cost benefit analysis) which would have to include effects elsewhere in Europe which might otherwise be neglected by the national government. Dunkerley, Mackie and Proost (2006), for example, recommend linking the level of funding to the proportion of through (transit) traffic. Grants would then relate to specific projects, or packages of projects, or policy interventions, though the agency would not determine which projects should go ahead. Such grants should be at least match-funded by member states to prevent cost escalation. Project selection would remain the jurisdiction of national governments or groups of such governments. A European infrastructure agency would also have a co-ordination role. There is a need for pricing strategies between member states to be co-ordinated to ensure efficiency. To ensure against technical incompatibility there is a need for technical standards to be co-ordinated. Co-ordination

of evaluation procedures would also ensure transparency in the distribution of funds between projects. This is reflected in conclusion 13.

Conclusion 13 A European infrastructure agency, financed by member states via the infrastructure charges levied at a national level, could have a role in coordinating pricing principles, technical standards and evaluation procedures. In terms of funding projects its role should be confined to paying grants to national or local governments on the basis of clearly defined criteria (e.g. proportion of international traffic, and meeting international environmental objectives, etc) related to effects within EU competence. The grants would relate to specific projects, or packages of projects, or policy interventions and would be at least match funded within member states to prevent cost escalation. The agency would not determine which projects should go ahead, this decision remaining with national or local governments or groups of such governments.

Whether a European or national infrastructure agency should be publicly or privately owned and operated is an interesting question. The private sector is often considered better at management than the public sector. There are divisions of opinion about whether this has always been demonstrated, for example in public-private partnerships. When this applies, and if management of the network is the agency's most significant task, the agency should therefore be in private hands. Other arguments for the agency to be a private enterprise include: revenue from transport user charges and their investment in new infrastructure is excluded from the public balance sheet and the agency can borrow money from the financial markets – both of which free the government from public sector borrowing constraints that may restrict investment policy. However, for the agency to be a private enterprise important questions need to be answered: who would regulate the agency and ensure pricing, investment and maintenance strategies are fair? What is the regulatory model? How would the agency be incentivised to invest in new infrastructure when it is efficient to do so and the right infrastructure at that? Does the structure of prices ensure that commercial decisions take full account of social and external costs as well as private and internal ones? What impact would shareholders' interests, take-overs, market variations of share prices, financial instruments, and tax avoidance schemes have on decisions? Would the agency be prevented from taking some commercial decisions that would be normal for private companies generally, such as investing in other sectors if it is profitable to do so, disinvestment, or shifting its portfolio of projects? These are important questions which remain to be answered and as such lead to the sentiments expressed in conclusion 14.

Conclusion 14 There is a lack of research and evidence as to a successful form of regulation if a transport infrastructure agency were to be privately operated. Poor performance of such an agency can have significant negative impacts on a nation's transport infrastructure (e.g. the UK experience with Railtrack and Metronet). There are arguably advantages to a transport infrastructure agency being managed by the private sector if this secures efficiency in management and ability to borrow from the financial markets. However, without evidence on an appropriate form of regulation it is speculation and opinion only that suggests one model of management (public or private) is superior to another. Further research in the area of regulation of transport infrastructure agencies

is much needed.

Transport pricing reforms have met with strong resistance and will continue to meet with such resistance as they have significant distributional effects. Acceptability barriers present the single biggest obstacle to the introduction of a pricing reform. There are a number of theoretical explanations for this resistance ranging from information deficiencies, a preference for the *status quo*, a tendency for people to find losses more painful than gains beneficial, and feelings for social justice. For a pricing scheme to be successful evidence points fairly clearly towards the need for the objectives of the scheme to meet the needs of transport users and be superior to other forms of transport measures as referred to in conclusion 2. Revenues need to be redistributed (see conclusion 8), alternative methods of travel need to be provided and fairness needs have to be considered very carefully. The benefits of the scheme should also be conveyed in an objective manner that focuses on the traffic problems and solutions people perceive as helpful. The role of a charismatic champion should also not be underestimated as should the timing of the pricing reform (in relation to windows of opportunity). Public acceptability of a pricing reform will also vary across Europe with purchasing power. Where a country's citizens have little purchasing power and transport expenditure takes a significant share of the total household budget it may be expected that the acceptance of a disadvantageous looking pricing reform will be even lower than elsewhere.

A phased implementation strategy is needed to introduce a pricing reform. Such a strategy needs to be defined around barriers to implementation and needs to account for path dependency. To date efforts have focused on overcoming technological and legal or institutional barriers in the definition of an implementation path. It is also necessary to consider acceptability barriers. For example, a preference for a stable environment can lead to referenda after a pricing reform giving a more favourable outcome for implementation than referenda before a pricing reform. This raises a social dilemma as it is difficult to implement a pricing reform against an initial majority of voters, even if sufficient people are expected to change their opinion after the reform, thereby creating a majority in favour of the reform. A better understanding of the dynamic nature of acceptability over time (during the preparation phase, during implementation and post the decision) is therefore needed. This would include the acceptability paths for different stakeholders and their interactions with published opinion/media as well as the influence of lobby groups on the process.

Conclusion 15 Acceptability barriers present the single biggest obstacle to the introduction of a pricing reform. Acceptability cuts across many of the themes identified in earlier conclusions: the need for a reform from the perception of transport users, the nature of the accompanying package, revenue use, transparency and fairness are all critical components of an acceptable scheme. A transport pricing reform also needs to be presented to the public in terms that can be easily understood. A charismatic champion and the correct timing of the policy all help contribute to acceptability.

Conclusion 16 Important to the success of any implementation strategy is the influence the implementation path has on acceptability, the dynamic nature of acceptability

during the implementation process, the role of referenda and the interactions between different stakeholders and published opinion/media or lobby groups. However, research evidence on the specific nature of these effects is very limited, and research in this area needs to be actively pursued.

6.2. Recommendations by mode, country and prioritisation

The majority of the discussions of the expert group and the conclusions presented above are equally applicable to all modes and countries, and no specific conclusions on individual modes or countries were reached by the group. Saying that two of the conclusions have some mode specific dimensions to them, though none have any country specific dimensions. This section of the report has therefore been developed by the project team based on the research projects examined and the presentations made in the course of the project. In some places it draws on the discussion in other expert groups. As such it represents the viewpoint of the authors only.

6.2.1. Mode

ROAD

In many countries road infrastructure is the direct responsibility of central and local government; there is often no direct charge for the use of roads but annual licence duty and fuel tax raise in total much more than the cost of providing and maintaining roads. In some countries motorways are provided by separate private or public agencies with direct charges through tolls or time-related charges based on cost recovery principles.

We believe there is significant scope for revisions to charging methods and structures to align charges much better to marginal social cost - even if both the administrative cost and the need to raise revenue make full marginal social cost pricing impracticable (see the report of the inter-urban road expert group for further discussion). The reformed charges should be based on short run marginal social cost, as road capacity is subject to indivisibilities and capacity is slow to adjust to match demand (see conclusion 3).

We do not see a clear case for directly earmarking revenue from charges to spending on roads. Whilst road user groups argue for such a policy, it will not guarantee acceptability. Many members of the public are opposed to major road building, especially in more densely populated or environmentally sensitive areas, and there is not a consensus as to whether revenues raised in one region can be spent in another region even if earmarked for roads (see conclusion 10). Some theoretical economics models lend support to earmarking all road charges to the road sector as an efficient policy. However, these models are too far removed from reality to assume that this will generally be the case in practice - for instance they do not take account of indivisibilities, of the high cost of adding capacity to existing roads and of the external costs of doing so. This is discussed more fully in the inter-urban road report.

To the extent that it is desired to raise more than marginal social cost in the transport sector, to say fund new infrastructure, evidence suggests that this may be efficiently done through annual charges and through fuel tax, where the elasticity is reasonably low and it is cheap to collect.

We see considerable benefits in the main road network being the responsibility of an arms length agency with clear political guidance on the criteria to be used in providing road infrastructure and charging for its use. We would favour that such an agency be retained as a government agency until questions regarding the regulation of private sector transport infrastructure agencies are answered (see conclusion 14).

RAIL

In the rail sector charges are generally based on marginal costs (with mark-ups) and infrastructure charges are earmarked for the infrastructure manager. In part this is a consequence of the existence of the EC Directive on rail charging and the fact that the revenue raised through rail infrastructure charges does not fully meet the costs of operating the network. In our opinion this position is consistent with the conclusions of this expert group. As rail capacity is difficult to quickly adjust to changes in demand, charges should be based on short run marginal cost. This and the fact that the rail sector is generally subject to significant economies of scale imply revenues will then fall short of covering all operating costs.

Cost recovery can be improved with scarcity charges and two part tariffs, as is discussed more fully in the report on the rail expert group. When on track competition increases, the case for increasing cost recovery through scarcity charges strengthens. Scarcity charges are applied where capacity exceeds demand (typically platform slots at mainline train stations at peak times). If further revenue is needed either to improve cost recovery or fund new infrastructure two scenarios present themselves. Where services are subsidised and there is no issue of open access competition, additional revenue is best raised through a two part tariff. In this situation, the fixed element of the tariff may be based on the avoidable cost of the capacity required, specified in a long run track access agreement running in parallel with the contract securing the services in question. This will give appropriate incentives to the funder of the services and the infrastructure manager, whilst removing cross-subsidisation of social services by commercial services. Otherwise, with open access arrangements it will be necessary to impose a mark-up per train kilometre, varying with market segment.

PORTS AND AIRPORTS

Ports and airports are generally constituted as separate commercial entities although they may receive central or local government subsidies. Port dues and airport landing charges are generally earmarked to these bodies. In both ports and airports, many services are provided on a competitive basis by separate entities to the facility owner and charged for accordingly.

As set out in this expert group's conclusion 10, when capacity expands in line with demand, charges based on long run marginal costs will be more appropriate than ones

based on short run marginal social cost. If this is the case in ports and airports then long run marginal social cost based charges will be most appropriate. It can be difficult to ascertain what long run marginal costs are, if this is the case with ports and airports it may be necessary to set charges at the avoidable cost of providing additional capacity.

Where there is open access to the facility, then again we would expect a major contribution to cost recovery to come from scarcity charges, levied according to the type of aircraft or vessel and by time of day/week/season. As with rail services, where capacity is provided for a specific operator on a long run contract (as is true of many port terminals), it may be efficient and fair to recover the capital cost of that capacity through the fixed element of a two part tariff, with the variable element reflecting variable costs of actual use of the facilities.

We see no reason why surplus revenues from ports and airports should be wholly earmarked to ports and airports. This is for two reasons. Firstly, operators enjoy the profits that come from having the right to scarce capacity even when environmental or planning considerations limit the scope for capacity expansion. In this situation the surplus produced by scarcity charges might reasonably be paid to the government as a specific levy. Secondly, and this is applicable to all modes, any charges related specifically to environmental costs should be paid to the government rather than to the owner of the infrastructure. An exception would be where the infrastructure owner is required to meet specific mitigation costs (such as noise insulation around airports). Otherwise a counter productive incentive is produced for the infrastructure manager to attract environmentally damaging traffic. Given that unlike road and rail infrastructure a number of ports and airports are privately owned and operated there will be resistance from the operators to the transfer of revenue to the government or to other 'competing' transport modes. Some earmarking within the sector (e.g. from large ports to small ports) or between modes in the hinterland of ports and airports may be justified on economic grounds. This cross-subsidisation may form a more acceptable policy to port and airport infrastructure owners.

REGULATION

For all modes we see benefits in their being a regulator, independent from day-to-day government intervention, to oversee charges and use of revenue. Such a regulator would have specific duties, to prevent abuse of monopoly power, to investigate efficiency and to examine use of revenues, working within a policy framework set by the government.

6.2.2. Countries

There is a particular problem amongst some new member states with lower incomes but substantial transit traffic arising from high income neighbours. There is a need to pay for appropriate infrastructure, in the interests of the EU as a whole, but resistance to high charges which would be unaffordable for the local population. This situation provides justification for income transfers from richer to poorer countries to fund infrastructure as happens on a large scale through regional and cohesion funds. It may

also justify continuation of a two-tier network, with charges confined to, or higher on, high quality long distance routes, provided that this does not lead to excessive diversion from these to poorer infrastructure where costs are higher.

Appraisal processes also need to effectively account for equity considerations as well as efficiency considerations. A focus on efficiency criteria alone may lead to infrastructure investment concentrating in the high income core countries of the EU. This is unlikely to be acceptable to the lower income member states, but may also be perceived as unfair by the high income states.

For countries that experience a high proportion of transit traffic there are incentives for countries to adopt inefficient pricing and investment strategies, from the perspective of the EU, in order to maximise the welfare of their citizens. We believe, as set out in conclusion 9, that the same guiding principles to infrastructure prices should be applied across networks and across Europe. This is not the same as a harmonisation of prices.

6.2.3. *Priorities*

It is difficult to make recommendations regarding the order in which conclusions should be implemented. In part this is a reflection of the lack of evidence on the dynamic nature of acceptability. A priority therefore is to examine the influences on acceptability during the implementation path – as recommended in the expert group's conclusion 16.

In the absence of such research, the conclusions that focus on processes would lend themselves to being implemented in the short term. For example, it is clear that a transparent and efficient use of revenue is needed for a transport pricing scheme to be acceptable. Implementing appraisal processes that meet criteria of efficiency, environmental impact and equity, as set out in conclusion 11, would therefore be an important first step. In the longer term institutional reform is necessary. However, a European delivery agency that draws its funds from existing sources may act as an important intermediate step to complete institutional reform. An example of such an agency is the French AFITF. Setting up a European infrastructure agency along these lines may therefore act as a short to medium term objective. The recommendations relating to charging structures, independent agencies and regulation can only be implemented once acceptability barriers have been overcome. These therefore represent medium to longer term objectives.

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Annex I: Full list of Expert Group Members and Attendance

		Company/ Organisation	Meeting 1 Feb 14th	Meeting 2 May 11th	Meeting 3 Dec 4th	Meeting 4 April 16th
1	Phil Goodwin (Chair)	University of West of England, UK	X	X	X	X
2	Gunnar Alexandersson	Community of European Railways, Brussels			X	X
3	Tom Antonissen	LOGOS Public Affairs, Brussels. (Formerly of the European Road Federation, Brussels)	X	X	X	X
4	Jean-Jacques Becker	Ministry of Transport, France		X	X	X
5	Edward Calthrop	European Investment Bank, Luxembourg		X		
6	Francis Cheung	Transport research Centre (AVV), Ministry of Transport, Netherlands	X	X	X	X
7	Carlo Corposanto	Community of European Railways, Brussels	X			
8	Riccardo Enei	ISIS, Rome, Italy				X
9	Laurent Frankx	International Association of Public Transport (UITP), Netherlands	X			
10	Michael Lloyd	Alliance of Maritime Regional Interests in Europe (AMRIE), Brussels	X	X		X
11	James Laird (Rapporteur)	University of Leeds, UK	X	X	X	X

		Company/ Organisation	Meeting 1 Feb 14th	Meeting 2 May 11th	Meeting 3 Dec 4th	Meeting 4 April 16th
12	August Mesker	Confederation of Netherlands Industry and Employers VNO-NCW. Member of UNICE. Netherlands	X	X	X	X
13	Ferenc Meszaros	BUTE, Budapest, Hungary			X	X
14	Chris Nash (Expert Group Leader)	University of Leeds, UK	X	X	X	X
15	Esko Niskanen	STARresearch, Finland			X	X
16	Vicenc Pedret	DG-TREN, European Commission				X
17	Stef Proost	Catholic University Leuven (KULeuven), Leuven, Belgium	X		X	
18	Frederik Rasmussen (Project officer)	DG-TREN, European Commission			X	
19	Andrea Ricci (Co-ordinator)	ISIS, Rome, Italy	X	X	X	
20	Werner Rothengatter	Karlsruhe University, Germany		X		
21	Catharina Sikow	DG-TREN, European Commission	X		X	
22	Árpád Siposs	3K: Co-ordination Centre for Transport Development (Government department, Hungary)	X	X	X	X
23	Stefan Suter	ECOPLAN, Bern, Switzerland		X		
24	Jens Schade	TUD, Dresden, Germany			X	X
25	Antti Talvitie	Helsinki University,	X	X	X	X

		Company/ Organisation	Meeting 1 Feb 14th	Meeting 2 May 11th	Meeting 3 Dec 4th	Meeting 4 April 16th
		Finland				
26	Andrew Traill	European Shippers Council (ESC), Brussels	X	X		
27	Tom Worsley	Department for Transport, UK	X	X	X	X

Annex II: Meeting 1 - Agenda and Meeting Report

EXPERT GROUP ON IMPLEMENTING PRICING REFORMS

WORKSHOP 1

OVERVIEW OF ISSUES AND STATE OF THE ART

14TH FEBRUARY 2007

NH Grand Place Arenberg

15 Rue d'Assaut - B-1000 Brussels

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FINAL AGENDA

09:30	Introductions; objectives and overview of IMPRINT-NET - <i>Andrea Ricci</i>
09:45	Objectives of group - <i>Chris Nash</i>
09:55	Discussion
10:10	Methods of working of the group – <i>Phil Goodwin (Chair)</i>
10:15	Current state of research - <i>Chris Nash and James Laird</i>
10:45	<i>Coffee Break</i>
	<u>Overview of issues</u>
11:00	EC - <i>Catharina Sikow, DG TREN</i>
11:15	UK - <i>Tom Worsley, Department for Transport, UK</i>
11:30	Hungary - <i>Árpád Siposs, National Road Administration, Hungary</i>
11:45	Discussion
12:30	<i>Lunch</i>
13:30	Road - <i>Tom Antonissen, European Road Federation (ERF), the Brussels Programme Centre of the International Road Federation (IRF)</i>
13:45	Rail – <i>Carlo Corposanto, Community of European Railways (CER)</i>
14:00	Ports – <i>Michael Lloyd, Alliance of Maritime Regional Interests in Europe (AMRIE)</i>
14:15	Business - <i>August Mesker, Confederation of Netherlands Industry and Employers VNO-NCW</i>
14:30	Discussion
15:15	<i>Tea</i>
15:30	Key issues for future meetings - Discussion
16:30	Close



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Rapporteur: *James Laird (ITS), J.J.Laird@its.leeds.ac.uk*

**EXPERT GROUP ON IMPLEMENTING PRICING REFORMS: REVENUE
RAISING AND USE**
MEETING 1 (EG6-1): OVERVIEW OF ISSUES AND STATE OF THE ART
HOTEL GRAND PLACE ARENBERG, BRUSSELS
14TH FEBRUARY 2007

REPORT OF THE DISCUSSION
Draft v1.0
8th March 2007

INTRODUCTION

This is a report of the discussions of the first meeting of IMPRINT-NET Expert Group 6, on implementing pricing reforms in inter-urban transport with a particular focus on revenue raising and use. The meeting was held in Brussels on 14th February 2007. The aim of the group is to bring together researchers, policy makers and stakeholders in a series of four 1-day meetings, in order to synthesise information on research and practice and build consensus on the issue of revenue raising and revenue use from transport pricing. In doing so, it seeks to draw from and build upon the findings of EU funded research projects, and in particular REVENUE and FUNDING.

Experts are invited to participate in the group in their personal capacity, rather than as representatives of particular organisations. ‘Chatham House’ rules therefore apply so as to encourage free and open speech. The objectives for this first meeting were to provide an overview of the state of the art and to discuss the issues that should be considered in subsequent meetings. A series of presentations were made by members of the group⁵. This report focuses on the discussions sparked by those presentations, but groups the issues by theme rather than in the chronological order in which they were raised on the day. The remainder of this note is structured around those themes:

- Objectives of pricing reform;
- Prices and regulation;
- Cross-subsidisation between and inter-relationships in networks;
- Implementation paths.

⁵ Copy of meeting agenda, pre-meeting briefing note and presentations are available on the project website www.imprint-net.org.

The final section of the note sets out some conclusions of the meeting with the aim of identifying the issues to be considered further in future meetings.

Objectives of a pricing reform

The literature and evidence from successful transport pricing reforms suggests that clear objectives are needed for success. It is, however, apparent that different interest groups see different objectives from a pricing reform with important implications for revenue use. At one end of the scale an objective of a pricing reform is to ensure prices fully reflect costs thereby allowing transport users to make fully informed transport choices. Such a situation maximises economic efficiency. At the other end of the scale an objective of a pricing reform may be purely to raise sufficient revenue to fund the construction of new infrastructure. Intermediary positions also exist in which a transport pricing reform with earmarking is seen as a mechanism for making transport more efficient and for increasing investment in transport infrastructure and services. The EC transport White Paper (Time to Decide), for example, reflects such a combination of objectives; however, similar positions are also evident from interest groups who perceive there to be a current and historic lack of investment in transport infrastructure.

A pricing reform (including the use of subsidies) may also be used as an incentive structure for policy objectives ranging from increased productivity in supplying transport services to encouraging a ‘better’ use of the transport system – however ‘better’ is defined (e.g. from reducing the environmental burden of transport to maximising the use of the transport system).

It is fair to say that different potential objectives appeal to different stakeholder groups. Pricing reform objectives that lead to wholesale price increases with little return to those who pay the charge, as would be expected, are not welcomed by users. For example in Switzerland HGV interest groups forced a referendum on the issue of HGV charges being fed into the FinOV rail fund, though the motion was defeated as the Swiss public voted to continue the fund.

Prices and regulation

The Commission’s pricing policy, as set out in the mid-term review, is to move towards a situation of ‘smart’ pricing, where transport prices better reflect costs. Whilst the other five modal groups are considering pricing issues in detail with the emphasis on marginal cost based pricing a number of issues relating to prices were raised. First there is the issue of whether the starting point for transport prices should be long or short run marginal costs. Where the lags between price related changes in demand and adjustments in supply (capacity) are long, efficient use of infrastructure is maximised through the use of short run marginal cost based pricing. However, in certain circumstances there can be an argument for considering long run marginal social costs as a basis for pricing and these situations maybe worth exploring. Under both short and long run marginal cost based pricing incentives to deliver optimal pricing and

investment decisions on the part of the decision-maker are required. How this should be done is an issue that is worth exploring.

The point was also made that pricing whilst sending signals to users regarding the costs of their choices may not be the most effective way of reducing the burden of some external costs. For example regulation may be a more effective mechanism of achieving safety and environmental policy objectives.

One of the difficulties with marginal cost based pricing is that it is difficult for politicians to put across how prices will change as a consequence of the pricing reform, and therefore how the reform will impact on transport users. This is because prices will go up and down by varying amounts with a shift to marginal cost based charging. This has reduced the political will to introduce such a reform. Furthermore where prices reflect external costs an issue exists regarding who should receive the revenues from the charge – paying them to the infrastructure manager may be perceived as unfair and may give them perverse incentives..

One argument was that the market is capable of deciding the correct prices for use of the transport system and those prices need not therefore be imposed centrally. This would entail a de-regulation of the transport market including devolving responsibility for providing and maintaining the road network to the private sector. Under the principle of subsidiarity the decision-making for the de-regulated networks would be undertaken at a local or regional level. Given the likelihood that natural monopolies will occur however there will be need for a regulator in such an environment. The point then arises as to how extensive a role the regulator should have in determining prices and investment decisions and in safeguarding the situations where the public good aspect of transport networks will be important, such as rural areas.

The role of transport taxes in an environment in which direct charges for access to the transport network are levied was also discussed. In an ideal environment there should be no taxation on intermediate goods (such as freight transport or travel during the course of work). Whether non-work related trips are viewed as intermediate goods is a debatable point. It could be argued that commuting trips and shopping trips are intermediate goods, and even leisure trips in some circumstances can be viewed as intermediate goods. The road transport sector is however heavily taxed. There is in the public's mind a blurring between vehicle and fuel tax and a charge for use of the road system, which can make it difficult to introduce a charge to use the road system – as the public believes it is already paying for use of that system. Charges additional to taxation have been accepted in Hungary for use of the motorway network. However, these charges are for the use of the highest quality parts of the network and the revenues are earmarked for use within the motorway system. This is also the case in Austria. HGV charges (additional to taxation) in Germany and Switzerland have also been accepted – however as HGV charges do not directly affect the majority of the population whilst the revenues from such charges are directed into projects that do benefit the population this may not be surprising. The spectre of a large road user charge in addition to taxation has amongst other reasons also prompted 1.8 million people to sign an e-petition against road pricing in the UK. What constitutes an acceptable balance between charges and taxation within the sector is not clear. Clearly

certain interest groups prefer to see charges for accessing the transport system minimised with for example charges constrained to infrastructure expenditure, whilst other groups see charges being used as incentives to achieve policy objectives. It was suggested that future discussions on this issue would benefit from the contribution of one or some representatives from the Finance Ministries, as it was speculated that their perspective will differ again.

Cross-subsidisation and inter-relationships in networks

Cross-subsidisation between sectors or within the transport sector between modes and regions can be controversial. Evidence presented at the meeting with regard to motorway tolling suggests that earmarking to the specific mode or infrastructure from which the charge is levied is often viewed as acceptable. The opinion that cross-subsidisation between modes in the urban environment was reasonably accepted was expressed, possibly this is due to the inter-dependency of the modes. On the other hand the opinion was also expressed that, at the inter-urban level, rail and road are not necessarily viewed as one network, regions don't like subsidising other regions and member states do not like subsidising other member states (which have similar levels of development). Clearly however, despite public perceptions, pricing and investment decisions on one mode are inter-related with similar decisions on other modes. There does also seem to be some acceptance of directing money to poorer regions within the EU and towards better integration with new member states. Whether the funds necessary for such 'integration' projects should be raised through transport charges rather than from general taxation, however, is a separate issue which was not discussed.

Results from research using theoretical models demonstrate that in the absence of cooperation between the decision-makers responsible for regional price-setting and investment decisions sub-optimal prices (e.g. prices can be too high) and sub-optimal levels of investment (capacity can be too low) can result. When networks are regionalised but inter-dependent, as they are in the EU, incentivising the decision-makers to act in a welfare maximising manner will be important. This is particularly relevant in the context of marginal cost based pricing as research in the IASON project into the economic impacts of transport policies indicated that such a pricing strategy benefits the core of the EU more than the periphery.

There also appears to exist distrust between the populace and the government, in that the government is not trusted to spend revenue from charges and taxation in a worthy manner. Exploring the manner in which pricing and investment decisions can be depoliticised is therefore important. Earmarking may be one answer but a more deregulated transport sector with a 'privatised' decision-making apparatus might be another. Whilst it may be ideal to separate the revenue raising from revenue spending decision the political requirement for earmarking may make that difficult.

Implementation paths

The implementation path of a pricing reform is complex. The Hungarian motorway tolling situation, as discussed earlier, includes tight earmarking. However is such tight earmarking a consequence of the implantation path – i.e. introducing pricing on one

mode and one section of the network at one time? Would a different earmarking regime have been adopted if charging had been introduced on a much larger part of the network?

Furthermore a phased implementation will be necessary, particularly for road transport due to the logistical difficulties of equipping the vehicle fleet with payment/tracking devices. Phasing of a national scheme may therefore be necessary –e.g. phased by region with pricing being introduced in cities first. This will allow problems with the technology and other ‘teething’ issues to be identified before a scheme is rolled out nationally or internationally. However, such phased implementation schemes create complex challenges for the pricing structure during implementation. This is because to maximise efficiency different second best prices in each phase will be required that take cognisance of both other transport prices (outside the area directly affected by the pricing reform) and prices in other economic sectors.

Conclusion

The meeting concluded with a discussion regarding issues that could form the basis of future meetings. These can be grouped as follows:

INSTITUTIONAL

How do we decentralise decision-taking whilst preserving adequate regulation to prevent “beggar-my-neighbour” policies by local, regional or national government?

How do we avoid political interference with pricing and investment decisions making them inefficient? Could an infrastructure fund administered by an independent authority help? Or a privatised infrastructure manager with an independent regulator?

Do institutional solutions vary by mode, traffic density and region/country? How can equity considerations be taken into account?

What theoretical relationships are there linking charging and revenue use?

IMPLEMENTATION PATHS

What can we learn from the Stockholm experience and other practical applications? Have the objectives of the pricing reform been met, what are the efficiency and equity impacts?

What are the conditions for support of a pricing reform? How to balance the introduction of new charges with existing taxation structures?

How do we sell our work to a policy person within the European Commission?

MISCELLANEOUS

Discussion should include impacts of inter urban pricing on urban areas.

What is the best use of existing funds taking transport revenues as given?

The role of PPPs as a means of incentivising suppliers.

It was also suggested that the group be expanded to include someone from an environmental interest group as well as someone from a Ministry of Finance.



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Annex III: Meeting 2 - Agenda and Meeting Report

INSTITUTIONAL ASPECTS OF FUNDING TRANSPORT INFRASTRUCTURE FROM TRANSPORT CHARGES

MEETING 2 OF THE EXPERT GROUP ON IMPLEMENTING PRICING REFORMS

11TH MAY 2007

*NH Grand Place Arenberg
15 Rue d'Assaut - B-1000 Brussels
Tel: +32 2 501 16 16 ; Fax: +32 2 501 18 18*

FINAL AGENDA

09:30	Introductions; objectives and review of outcomes from first meeting <i>Phil Goodwin (Chair) and James Laird (Rapporteur)</i>
09:40	Summary of progress in other Expert Groups <i>Andrea Ricci (Project Co-ordinator, ISIS)</i>
10:15	Discussion
10:30	<i>Coffee Break</i>
10:45	Network-based Solutions for Pricing and Financing of Motorway Infrastructure <i>Professor Werner Rottengatter (IWW, Universität Karlsruhe)</i>
11:15	Discussion
11:50	The French Experience with the AFITF <i>Jean-Jacques Becker (Economic Division, Ministry of Transport (France))</i>
12:10	Discussion
12:45	<i>Lunch</i>
13:45	The Swiss Railway Investment Fund: Concept, Practice and Evaluation <i>Stefan Suter (ECOPLAN)</i>
14:15	Discussion
14:45	Open discussion
15:15	<i>Tea</i>
15:30	Open discussion
16:30	Close



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**EXPERT GROUP ON IMPLEMENTING PRICING REFORMS: REVENUE
RAISING AND USE**
MEETING 2 (EG6-2): INSTITUTIONAL ASPECTS OF FUNDING TRANSPORT
INFRASTRUCTURE FROM TRANSPORT CHARGES
HOTEL GRAND PLACE ARENBERG, BRUSSELS
11th MAY 2007

REPORT OF THE DISCUSSION

Draft v1.0
11th June 2007

ATTENDEES

Tom Antonissen, Jean-Jacques Becker, Edward Calthrop, Francis Cheung, Phil Goodwin, James Laird, Michael Lloyd, August Mesker, Chris Nash, Andrea Ricci, Werner Rothengatter, Árpád Siposs, Stefan Suter, Antti Talvitie, Andrew Traill, Tom Worsley.

Apologies: Laurent Frankx, Anton Goebel, Andreas Kopp, Stef Proost, Bart Roets, Catharina Sikow, Ida Tramonti.

INTRODUCTION

This is a report of the discussions of the second meeting of the IMPRINT-NET Expert Group on implementing pricing reforms in inter-urban transport with a particular focus on revenue raising and use. The meeting was held in Brussels on 11th May 2007. ‘Chatham House’ rules apply in reporting the discussions stimulated by the presentations⁶. This report focuses on the discussions, but groups the issues by theme rather than in the chronological order in which they were raised on the day. The remainder of this note is structured around those themes:

- Use of revenue for transport investment;
- Pricing;
- Role of an infrastructure agency;
- Regulation; and
- Next steps.

⁶ Copy of meeting agenda and presentations are available on the project website www.imprint-net.org.

Use of revenue for transport investment

There exists some consensus that, if surplus revenues occur, some form of income transfer (or cross-subsidy) between modes or regions will need to occur. This is because it seems impractical to hypothecate all revenue from transport charges for investment at the exact location where the revenue was generated. The impracticality stems from the fact that it would be inappropriate to invest revenue in poor projects just because surplus revenue exists and it needs to be spent on something. It is therefore necessary for the decision-maker to have a degree of freedom to choose the investment strategy (mode and location) to ensure worthwhile projects are chosen (i.e. the revenue is used efficiently).

Differences, however, exist as to the exact extent of the freedom that should be allowed, as acceptability of revenue use has strong implications for fairness (i.e. equity). It also seems that what is perceived as fair seems to vary with the cultural background of the region and the role of the private sector in providing transport services. For example, private sector operators (port authorities, airlines, etc.) are unlikely to support direct investment in their competitors. Hinterland investment in road, rail and inland waterway routes would be more acceptable than such an alternative. Acceptability of the use of revenues generated from the road sector for investment in public transport also appears to vary culturally and by the nature of the route (urban/inter-urban). As cited in the first meeting the inter-dependence of modes in an urban environment means that cross-financing from road to public transport can be acceptable in that environment. In France it is not an issue that some of the revenues from the motorway tolls are used to provide funding for the public transport projects in the AFITF⁷. This is also the case with respect to the HVF⁸ and the FinöV fund in Switzerland. However, in Germany 100% cross-financing was an issue and acceptability for the VFIG has only been achieved with 50% of the net revenue from the HGV charges being used for road projects. There also exists a body of opinion in Europe that considers the revenues raised from the road sector should be only spent on the road sector. Though within that view there is acceptance that there may be strong reasons for the revenues to be invested in regional networks other than the one in which the revenue is raised.

Cross-financing between regions and modes therefore appears acceptable provided that it meets certain criteria of efficiency and equity (criteria that may vary across Europe). Clearly, however, there is a need for a body (possibly a regulator of some sort) to judge what is an efficient, but more importantly equitable treatment of the revenue, between routes, modes and regions.

Pricing

There exists some consensus that pricing and financing schemes should be developed for whole networks and not for single links (e.g. an isolated toll road). By developing the scheme for a complete network it is possible to account for interactions between the

⁷ Agence de Financement des Infrastructures de Transport de France.

⁸ Heavy Vehicle Fee

different components of the network – that is how changes in one part of the network affect other parts. Such a pricing scheme is used in Germany, for the derivation of the heavy goods vehicle charges, along with a forward looking costing system which also appears necessary. Such a forward looking system considers the traffic imposed damage costs, the depreciation of the existing network over time and planned enhancements to the network, all of which to a greater or lesser extent depend on future traffic flows. What of course is less certain is what constitutes a single network – is it single or multi-modal? Some members of the group preferred single mode networks, whilst it was thought that within the context of a European infrastructure fund the Commission would be looking for a multi-modal fund. At a national level, within an inter-urban environment and an environment in which the different modes are de-regulated to different degrees it was, however, felt that the networks used for costing purposes would need to be single modal, possibly disaggregated into regions as in Japan.

Some discussion centred on the costing system used in setting the prices for the HGV charges in Germany. The German system allocates all infrastructure costs, including investment costs, by vehicle type. Prices are then set to recover these costs. This is a form of long-run average cost pricing, and is therefore at odds with the principles of short run marginal cost pricing. Long run average cost pricing had an intuitive appeal to large sections of the group. However, one of the problems with such an approach is the allocation of capacity costs, as prices are low where traffic volumes are high and high when volumes are low. Such a pricing strategy could therefore lead to prices in the peak being lower than in the off-peak, which would send the wrong signals to both the users of the transport network but also to the infrastructure operator - who should be encouraged to expand capacity where infrastructure is congested. Notwithstanding that prices set at long run average costs appealed to some members of the group. It was suggested that where the use of capacity needed to be optimised this could be done through the use of additional ‘congestion-related’ charges, whereas the internalisation of externalities (namely safety and environmental externalities) could be addressed either through regulation (e.g. carbon trading, safety and emission standards). If prices are too high on low trafficked sections of the network (or on entire regional/modal networks) a subsidy from central government can be used to lower the price. It was also suggested that it would be possible to include safety and environmental externalities into the German cost allocation process and therefore the price faced by transport users.

An interesting question than arises as to what exactly the differences are in prices between a costing system based on second best marginal cost prices (with mark-ups to recover investment costs) and one based on long-run average costs with top-up congestion charges and subsidies in low trafficked parts of the network. Will there be a material difference in the prices faced by users? Or is it just a case of presentation?

Furthermore, it is clear that there is an important role for a regulator within either price setting system (short run marginal cost based or long run average cost based). Primarily this is due to the potential use of mark-ups in both systems, but it is also needed to ensure the cost allocation process between vehicle types, infrastructure types, time periods, etc. is transparent and fair. An additional but very important role for a regulator would be to ensure that investment in new transport infrastructure occurs.

Role of an infrastructure agency

The role of the three infrastructure agencies, the VFIG, the AFITF and the FinöV, is confined to financing and in the context of the VFIG and FinöV promoting a pre-determined infrastructure investment programme. None of the three agencies therefore either determine the charges that are paid by users or how the revenue is used to fund new transport infrastructure. The AFITF and the FinöV are both managed by the public sector, whilst the VFIG is a private sector enterprise. Aside from increasing the efficiency of delivering new transport infrastructure the VFIG and the FinöV are important in ensuring that the imposition of heavy goods vehicle charges in Germany and Switzerland is acceptable – as the agencies promote transparency and earmarking. The purpose of the AFITF agency is less clear, given that no new charges were introduced at the time it was set up. However, it could be argued that it receives political favour as, in a world of tighter government budgets, it ensures that revenue for new transport infrastructure is ring fenced in the short to medium term.

Clearly the three infrastructure agencies have only limited powers. Some discussion therefore focused on the range of powers that agencies could or should have and whether the agency should be a private sector enterprise or part of the public sector:

- Allowing the agency to be responsible for investment decisions could de-politicise the investment process allowing objective decisions to be made. However, transport investment is a political issue and it seems unrealistic that it will be possible to completely divorce politicians from involvement in the debate surrounding transport infrastructure decisions. Furthermore, any set of investment objectives and rules that could be developed for an agency to use will be imperfect, particularly in the treatment of externalities and non-tangibles (e.g. some environmental goods). However, where an agency might be quite effective at making investment decisions is in prioritising a series of projects that constitute a strategy. The choice of strategy and decisions on major projects will, however, always remain political.
- Whilst it could be seen that there could be a role for national infrastructure agencies, there was some uncertainty regarding the role of a European multi-modal infrastructure agency, or even a single mode European infrastructure agency.
- In theory there should be no difference between public and private sector management of the infrastructure funding agency. However, it was considered by some at the meeting that the private sector is better at management and that as management of the network is the most significant task of an infrastructure agency it should be in private hands. Other arguments for the agency to be a private enterprise include: revenue from transport user charges and their investment in new infrastructure is excluded from the public balance sheet and the agency can borrow money from the financial markets – both of which free the government from public sector borrowing constraints that may restrict investment policy. However, for the agency to be a private enterprise important questions need to be answered: who regulates the agency and ensures pricing, investment and maintenance strategies are fair? What is the regulatory model: would it be one based on price (e.g. RPI-X), or

one based on level of service, or a mixture? How is the agency incentivised to invest in new infrastructure?

Regulation

An underlying thread in each of the three themes is regulation. The importance of regulation in an environment where an infrastructure manager sets prices and determines investment strategies cannot be overstated. The type of regulation required will be determined by the role of the infrastructure agency and whether it is public or private sector. Furthermore, and as set out above a lot of questions remain unanswered about the form and type of regulation that would be required.

Next steps

It was proposed that at the next meeting we should try to set out the main areas of consensus and differences of opinion that have occurred at the first two meetings. Furthermore we should aim to look at implementation paths, as the second area of issues identified at the first meeting. There was some interest in continuing the debate on institutional issues with documents or presentations on the Austrian ASFINAG infrastructure fund and the Japanese model of regional road authorities.



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Annex IV: Meeting 3 - Agenda and Meeting Report

MEETING 3 OF THE EXPERT GROUP ON IMPLEMENTING PRICING REFORMS

4TH DECEMBER 2007

NH Atlanta

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FINAL AGENDA

09:30	Introductions; objectives and review of outcomes from previous meeting <i>Phil Goodwin (Chair) and James Laird (Rapporteur)</i>
09:45	Summary of progress in other Expert Groups <i>Chris Nash (Expert Group Leader)</i>
10.05	Discussion
10:30	<i>Coffee Break</i>
10:45	Efficiency and equity implications of using transport prices to fund new infrastructure – some results from FUNDING (<i>paper included</i>) <i>Stef Proost (KULeuven, Belgium)</i>
11:15	Discussion
11.45	Implementation paths to inter-urban pricing reforms (<i>paper to follow</i>) <i>Esko Niskanen (STAResearch, Finland)</i>
12:15	Discussion
12.45	<i>Lunch</i>
13.45	Resistance to road pricing reforms: Implications to improve acceptability (<i>paper included</i>) <i>Jens Schade (Dresden University of Technology, Germany)</i>
14:15	Discussion
14.45	Open discussion
15:15	<i>Tea</i>
15:30	Testing consensus (<i>paper included</i>) <i>Phil Goodwin (Chair)</i>
16:30	Close



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**EXPERT GROUP ON IMPLEMENTING PRICING REFORMS: REVENUE
RAISING AND USE**
MEETING 3 (EG6-3): IMPLEMENTATION OF PRICING AND FUNDING
REFORMS
HOTEL ATLANTA, BRUSSELS
4th DECEMBER 2007

REPORT OF THE DISCUSSION

Draft v1.0
21st December 2007

ATTENDEES

Gunnar Alexandersson, Tom Antonissen, Jean-Jacques Becker, Francis Cheung, Phil Goodwin, James Laird, August Mesker, Ferenc Meszaros, Chris Nash, Esko Niskanen, Stef Proost, Frederik Rasmussen, Andrea Ricci, Jens Schade, Catharina Sikow, Árpád Siposs, Antti Talvitie, Tom Worsley.

Apologies: Michael Lloyd, Jérôme Pourbaix, Andrew Traill, Ida Tramonti.

INTRODUCTION

This is a report of the discussions of the third meeting of the IMPRINT-NET Expert Group on implementing pricing reforms in inter-urban transport with a particular focus on revenue raising and use. The meeting was held in Brussels on 4th December 2007. ‘Chatham House’ rules apply in reporting the discussions stimulated by the presentations⁹. Given the distinct nature of the presentations the structure of this note is based around the agenda, namely:

- Review of progress in other expert groups
- Efficiency and equity implications of using transport prices to fund new infrastructure – some results from FUNDING
- Implementation paths to inter-urban pricing reforms;
- Resistance to road pricing reforms; and
- Testing consensus and next steps.

⁹ Copy of meeting agenda and presentations are available on the project website www.imprint-net.org.

Review of progress in other expert groups

Discussion of modelling work considered by the roads group focussed on two issues. Some discussion concerned the modelling work that suggested that GDP would increase as a consequence of the introduction of MSC pricing across Europe. The discussion centred on the modelling and the mechanism by which this would happen. The use of the surplus revenue raised from the road sector to reduce labour taxes (thereby increasing labour supply) seems critical to this result as does the resulting productivity increase from the reduced congestion.

Modelling work had also suggested that MSC pricing on roads can raise more money than can be spent efficiently on the road network (on average – as this varies by region and road).

A difference exists between the road and rail groups as the rail group have considered raising extra money by mark-ups on marginal cost via price differentials by market segment, whilst this has not been examined (beyond vehicle type) by the road group. In part this is due to the need for rail to improve cost recovery - cost recovery is not an issue for roads as the roads sector typically makes a surplus under MSC pricing. In part it is also due to the difficulty of implementation on road.

In sectors where capacity typically keeps pace with demand – particularly the ports sector – short run marginal costs (SRMC) are typically close to zero. The ports group, and to a certain extent the air group (though airports are often operating close to capacity and therefore scarcity costs exist) are in favour of long run marginal cost pricing (LRMC). With LRMC pricing congestion costs are not included in the cost, as they are in SRMC pricing, instead the cost of expanding capacity to maintain zero congestion is included in the price. This fundamental difference between the groups is an important issue and one which will need to be returned to in the final meeting.

Ports and airports are also often private sector companies and in almost all instances are commercially operated. In a situation of high aircraft slot scarcity costs SRMC pricing would be considered unacceptable where the airport (or port) organisation is a monopolist – for example the private sector British Airports Authority (BAA) owns the three principal London airports, but the regulator prevents it from reaping high monopolist profits by charging scarcity costs.

Another obvious difference between the road and rail and the air and water sectors is that a lack of consensus on general principles (e.g. boundaries around ports and airports) exist for the air and water modes. In part this might be due to the fact that the external impacts of air and water transport are often outwith political control of member states, whilst for rail and road these impacts are felt locally.

Efficiency and equity implications of using transport prices to fund new infrastructure – some results from FUNDING

The FUNDING project concerns the partial funding by the EU of large infrastructure projects on the TEN-T. The project has not been finalised yet, though some of the results have been published. It can be demonstrated that it is not in the interest of member countries and regions to follow efficient pricing and investment policies where there is transit traffic (through traffic). This would imply a case for intervention on the part of the EU, both in terms of setting price caps and subsidising infrastructure investments. On efficiency grounds there is only a case for the EU subsidising investment costs where fixed (sunk) costs of investment are high (i.e. where the marginal costs of capacity expansion decreases) – as in such situations and with MSC pricing cost recovery will be less than 100%. This implies that the case for the EU subsidising rail and inland waterway (IWW) infrastructure is high, but it is weak for road and airport infrastructure projects (which typically exhibit constant returns to scale). However, if member states do not charge MSC prices for transport the case for any intervention by the EU on efficiency grounds dissipates (even for rail and IWW projects). The research did not look at the question as to what form of intervention was justified if some countries charge MSC prices and others do not.

Intervention from the EU on efficiency grounds is also only justified when transit traffic exists, as this is indicative of spillover benefits to other EU countries. A point was made that a case for intervention may also exist on social inclusion/equity grounds as peripheral countries need access to the core. As public money is costly (it is mainly raised through distortionary labour taxes) this affects the level of subsidy provided by the EU. A funding allocation mechanism based on the proportion of transit traffic (X) and the marginal cost of public funds (MCPF) was proposed. Some discussion followed concerning the derivation, role and practicalities of this mechanism particularly the role of X. From theory the proportion of transit traffic (X) is important in determining the pricing and investment behaviour of member states. X is also important in determining the financial viability of a project from the perspective of a member state. X is therefore an important parameter in handing out subsidies, though its precise form in the funding allocation mechanism is open to debate. How X should be measured is also an important issue – is it the proportion of transit traffic before or after the scheme is introduced, does it relate to a particular point(s) or is it some sort of average, etc. A point was also made that bilateral financing of a project is better than EU financing. This would therefore restrict the role of an EU investment fund to one in which transit traffic passes through at least 2 member states (e.g. Germany to the UK, or Ireland to France).

Common pool lobbying theory suggests that where federal funds are available lobbying for local projects will be intense (pork barrel politics). This is exemplified by the US interstate highway fund where it is argued that for every dollar invested in a good project a dollar is wasted. Linking federal subsidy to X is one mechanism by which the effect of pork barrel politics can be minimised.

A further preliminary conclusion from the FUNDING project was that the welfare costs of raising revenue to fund the TEN-T projects from the transport sector is much lower

than the costs of raising the funds through distortionary labour taxes. This of course does depend on whether the funds raised are invested in good transport projects. Some TEN-T projects have poor rates of return. It was therefore commented on that EU subsidies should only be directed towards projects which exhibit a good cost benefit analysis.

Implementation paths to inter-urban pricing reforms

Implementation paths for (or the phasing in of) pricing reforms are necessary as there are constraints and barriers to policy implementation. Constraints exist on the:

- coverage or scope of the pricing system (e.g. geographical, modes, user groups, externalities);
- composition and level of pricing measures (e.g. can fuel tax and distance based charging be levied concurrently);
- differentiation of prices (e.g. by time of day, mode, vehicle type);
- rules and principles covering revenue use (need for cross-subsidisation); and
- use of non-price measures (e.g. regulation on emission standards).

The constraints exist because of barriers. These barriers can be categorised as:

- Technological and practicable;
- Legal and institutional (e.g. right to freedom of movement, discrimination, etc.); and
- Acceptability.

The barriers represent underlying factors that cause the constraints to exist, and therefore hinder the implementation of efficient pricing. As the barriers are not typically set in stone, but can in fact be eased given sufficient time and effort, an implementation path can be constructed. This leads to the idea of defining an optimal implementation path as a sequence of constrained optima.

Potential examples of implementation paths would be introducing HGV charging before charging for passenger cars, introducing urban charging before inter-urban, or introducing motorway charging before any other form of charging. It is not clear whether any 'general' implementation path exists. On the basis that barriers will vary geographically and culturally it might be expected that implementation paths will vary by country and locality, though this is speculation.

Constraints may also exist along the implementation path. For example, it can be shown that if only HGVs are charged for road use the optimum price (for the HGV) is higher than if all vehicles are charged for using the road. This is because in the absence of charging passenger cars for road use there is too much congestion. Clearly this would be unacceptable for HGV operators, and might lead to adjustments which overshoot the final optimum. In such a situation it might be necessary to have a price cap on HGV charges. Capping HGV charges to average cost can also be viewed as one of a sequence of constrained optima.

Potentially the implementation path may affect the final pricing strategy that is achievable. This is because some barriers will never be removed and the initial phases of the strategy may lead to the creation of new barriers that cannot be ameliorated. In Rome, for example, following the enforcement of the Limited Traffic Zone there has been a substantial increase in two wheelers. The large number of two wheelers is perceived as a problem. Potentially the shift to two wheelers may reflect a cultural shift in behaviour, thereby creating new barriers, which may constrain a future transport strategy. More significant barriers may also be created along the implementation path through changes in land use patterns, investment in new infrastructure, or anything with significant sunk costs. It is therefore important to understand whether the constrained optima along the implementation path allow the desired final pricing strategy to be implemented. The group were not aware of any research in this area.

The issue was also raised that the principle of subsidiarity allows the Commission to set out a methodology for charging for costs, but the implementation of the pricing reform is a local matter. There is a potential dichotomy here as the methodology for costs can affect the implementation path, but the implementation path needs to be decided locally (due to the different cultures and barriers that are present in different countries for example).

It would also be interesting to know what the constraints and barriers were in the actual situations where attempts have been made to introduce road pricing, and which policies were successful at easing these constraints and barriers.

Resistance to road pricing reforms

Resistance to road pricing reforms can arise, even when the reforms are beneficial to society as a whole, due to the fact that people can deviate from ideal precepts of rationality in many settings. Cognitive psychology and behavioural economics emphasise the role of the status-quo, loss aversion, framing (is it a penalty or a bonus?), hidden tax bias (people prefer hidden over visible taxes as this leads to less hedonic pain) and the desire to reduce inconsistency between attitudes and behaviour (cognitive dissonance theory) as significant determinants to behaviour.

Research into the acceptability of road pricing specifically identifies that negative expectations dominate (as time gains are too abstract, whilst the road price is very visible), those who expect to gain perceive road pricing as fair, effective and socially desired (and vice versa), there are doubts about the effectiveness of road pricing at solving transport problems, there is no income effect, and individuals' social values (norms) have an affect on acceptability as do the system characteristics. Recent research presented has also indicated that cognitive dissonance theory is also relevant. Those people who perceive road pricing as inevitable are more likely to develop a positive attitude towards it than those who do not.

Presenting road pricing as inevitable (on the basis of cognitive dissonance theory) or exaggerating the prospective user charge (status-quo bias) would open a promoting agency up to criticisms of manipulation. It was therefore suggested that road pricing measures must be perceived as effective solutions to transport problems, bearing in

mind that time gains can be perceived as too abstract. Furthermore it was felt that the public needed to be involved in defining the solution to their transport problem and that an emotional link between their lifestyle and the pricing solution needs to be made. It is only through these linkages that a road pricing scheme can be perceived as credible and inescapable.

There is evidence to suggest that acceptability for a road pricing scheme erodes the closer to implementation one gets. This can be because for example privacy concerns, technology costs, trust in government to use data correctly (and not lose it), etc. become more pertinent the closer one gets to implementation. Evidence also suggests that acceptability for a scheme improves post-implementation. Such an improvement in acceptability can be put down to both status-quo bias (people prefer the current situation whatever that is) and information deficit (in that prior to implementation people could not fully understand how the scheme would impact on them). Either way it would suggest that referenda on road pricing schemes should not be held prior to implementation. If they are to be held at all they should occur post-implementation (as in the Stockholm scheme).

Whether a referendum is needed is a political viewpoint. One viewpoint is that politicians are democratically elected and therefore have a mandate to introduce new policies without the need to recourse to a referendum. However, the introduction of difficult policies in the absence of a referendum requires a strong leader with conviction and a degree of sensitivity. Such a leader provides a figurehead (or champion) to the policy and also, through their conviction, conveys the policy as inescapable – thereby, if cognitive dissonance theory is applicable, bringing support round to the policy.

For many economists the lack of support for road pricing is attributed to an information deficit by those who oppose the scheme, when society as a whole will benefit from the scheme. This point provided the focus of some discussion with the opinion also being expressed that information deficit is not the main motivation for resistance to reform. For example, often those who lead the opposition to policies are very well informed, more so than those who support the policy (e.g. anti-nuclear power station campaigners). The main motivations to resistance it was argued come from status-quo bias, loss aversion, framing (is it a penalty or a bonus?) and hidden tax bias. The situation appears more complex when there is a divided population with different viewpoints as this implies different status quos exist. This can lead to polarisation. Research and evidence on this matter is lacking therefore it is difficult to make policy recommendations in such a situation. The opinion was expressed however that exemptions for certain user groups, not regarded as socially needy, may exacerbate the polarisation between viewpoints.

Testing consensus and next steps

At the final meeting of the group there is a need to draw some conclusions regarding the research questions the group has been asked to consider. These questions are:


1. How can necessary funds be raised to finance new infrastructure?
2. What is the most efficient way to raise more revenue than implied by MSC prices?

3. How should surplus revenue be spent to promote efficiency, equity and acceptability?

On the basis of the discussions in the first two meetings seven relatively strong propositions were tabled to gauge reaction as to the means by which the final meeting could proceed. A number of points were raised regarding the scope and content of the propositions, as initially set out.

- There remains an issue between SRMC and LRMC pricing as a means to fund new infrastructure. There is a lack of clarity as to how SRMC pricing would work in practice. Additionally, there was no mention of using local taxation on the beneficiaries (e.g. a business tax) to fund new projects, nor is there a discussion about who the capital value of land used for transport should accrue to if the land is sold (e.g. ports, old railway sidings, etc.). This has not been an issue to date that has been discussed within the meetings.
- There seem to be a lot of caveats and qualifications within the propositions which mean that they lose substance. Areas where the wording of some propositions could be tightened up were identified. There is a need to be clear about terminology (e.g. prices, taxes, tolling, charging).
- The propositions need expanding to include the discussions of today's meeting.
- Focus of propositions should be top-down, setting out principles.

The final output of the project will be a report authored by the IMPRINT-NET consortium. This report will draw on the experience, views and discussions of the expert group members¹⁰. Where broad agreement occurs on a point or recommendation this will be identified and where disagreement occurs this will also be identified. Where applicable alternative viewpoints will be set out. This format is adopted as it will not be possible to agree every issue amongst the group members – this would require multiple drafts and is outside the scope of the research project.

	<p>Project Coordinator: Andrea Ricci (ISIS), aricci@isis-it.com Expert Group Leader: Chris Nash (ITS), C.A.Nash@its.leeds.ac.uk Rapporteur: James Laird (ITS) J.J.Laird@its.leeds.ac.uk</p>
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¹⁰ [Rapporteur's note] It is important to note that the expert group members are not signatories to the report and that the opinions of the experts, under the principle of Chatham House rules, will remain confidential. This allows experts to express their opinions in confidence particularly if they depart from their organisations stated policy (or deliberate lack of policy – as maybe the case).

Annex V: Meeting 4 - Agenda and Meeting Report

PRICING PRINCIPLES AND POLICY CONCLUSIONS

MEETING 4 OF THE EXPERT GROUP ON IMPLEMENTING PRICING

REFORMS

16TH APRIL 2008

*NH Grand Place Arenberg
15 Rue d'Assaut - B-1000 Brussels
Tel: +32 2 501 16 16 ; Fax: +32 2 501 18 18*

09:30	Objectives and review of outcomes from previous meeting <i>James Laird (Rapporteur)</i>
09:35	Summary of conclusions/progress in other Expert Groups <i>Chris Nash (Expert Group Leader)</i>
10.05	Discussion
10:25	Pricing principles (<i>section 4.1 of draft report</i>) <i>Chris Nash (Expert Group Leader)</i>
10:35	Discussion
11.00	<i>Coffee Break</i>
11.15	Draft policy conclusions <i>Phil Goodwin (Chair)</i>
11:30	Discussants: Vicenc Pedret (<i>European Commission</i>) Ferenc Meszaros (<i>Budapest University of Technology and Economics</i>) August Mesker (<i>Confederation of Netherlands Industry and Employers VNO-NCW. Member of UNICE</i>) Tom Worsley (<i>Department for Transport, UK</i>)
12.35	General discussion
13.00	<i>Lunch</i>
14:00	Discussion
15.15	<i>Tea</i>
15:30	Discussion
16:15	Closing remarks <i>Phil Goodwin (Chair)</i>
16:30	Close



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**EXPERT GROUP ON IMPLEMENTING PRICING REFORMS: REVENUE
RAISING AND USE**
MEETING 4 (EG6-4): PRICING PRINCIPLES AND POLICY CONCLUSIONS
HOTEL NH GRAND PLACE ARENBERG, BRUSSELS
16th APRIL 2008

REPORT OF THE DISCUSSION

Draft v1.0
24TH May 2007

ATTENDEES

Gunnar Alexandersson, Tom Antonissen, Jean-Jacques Becker, Francis Cheung, Riccardo Enei, Phil Goodwin, James Laird, Michael Lloyd, August Mesker, Ferenc Meszaros, Chris Nash, Esko Niskanen, Vicenc Pedret, Jens Schade, Árpád Siposs, Antti Talvitie, Tom Worsley.

Apologies: Stef Proost, Andrea Ricci, Frederik Rasmussen, Catharina Sikow, Andrew Traill

INTRODUCTION

This is a report of the discussions of the fourth meeting of the IMPRINT-NET Expert Group on implementing pricing reforms in inter-urban transport with a particular focus on revenue raising and use. The meeting was held in Brussels on 16th April 2008. ‘Chatham House’ rules apply in reporting the discussions stimulated by the presentations¹¹. Given the distinct nature of the agenda items the structure of this note is based around the agenda, namely:

- Review of progress in rail and road expert groups
- Alternative pricing principles
- General comments on draft policy conclusions
- Specific comments on draft policy conclusions

Review of progress in rail and road expert groups

¹¹ Copy of meeting agenda and presentations are available on the project website www.imprint-net.org.

The existence of a directive on rail means that the rail expert group has had a fairly tightly focussed set of meetings on the issue of how to measure the direct costs of rail. This does not have a lot of bearing on Expert Group 6.

The road group on the other hand is of more relevance to expert group 6 in that it is from road that the majority of any surplus revenue stream would be derived. The majority of the discussion was therefore spent on this.

The existing Eurovignette directive allows for differentiated charges but the average charge has to equal average infrastructure cost. Top of the list of issues associated with implementing road based charging is acceptability. Further issues include very high system costs and some nervousness in peripheral countries regarding regional economic impacts. Partial charging schemes (e.g. motorway only) may have negative diversionary impacts on other parts of the network. Short run marginal social cost prices (SRMSC) include infrastructure costs, accident costs, congestion costs and environmental costs. Health costs feature as a building block to valuing these costs (e.g. the value of air pollution). Land take costs like other capital costs do not feature in SRMSC prices.

In terms of impact, the models suggest that SRMSC pricing of the inter-urban road network will only bring a modest change in mode split, but will affect the volume of traffic both because of more local sourcing and selling of goods, and because of increased loads per vehicle. The models also suggest that revenue derived from the charge will often exceed what can efficiently be spent on roads, and the wider economic impacts depend on revenue use. It also seems the SRMSC pricing will bring more economic benefits to the core of Europe than to the periphery.

The draft conclusions of the road group suggest that any road based charging system should start simple (e.g. a simple kilometre charge for HGVs and congestion charging in urban areas). Due to the potential for diversionary impacts charging on motorways only should be considered carefully. An appropriate revenue use scheme is essential to implementation. It seems that not all the revenue can be directed to the transport sector as there are insufficiently good transport projects. Independent regulation may well be needed to add acceptability.

Alternative pricing principles

A pricing structure for transport may have the objectives of giving appropriate incentives to operators regarding how many trips to make and when to make them, appropriate incentives to infrastructure managers (as to when to expand or contract capacity); promoting competition; and financing infrastructure.

The main pricing alternatives can be categorised as long run marginal social cost (LRMSC) prices, SRMSC prices, average social cost (ASC) prices and two part tariffs. The major difference between LRMSC and SRMSC prices are that capacity costs are included in LRMSC prices but not in SRMSC, whilst congestion costs are included SRMSC prices but not in LRMSC prices. Both LRMSC and SRMSC include

environmental costs. The exclusion of congestion from LRMSC means that capacity is only used effectively under LRMSC prices when it can be quickly adjusted to demand changes. Therefore for infrastructure such as ports, where capacity is often determined by easily adjusted hinterland and terminal capacity, LRMSC pricing could be appropriate. Where capacity is difficult to adjust quickly (e.g. rail) SRMSC prices would be more appropriate.

Charges based on SRMSC prices also raise a number of practical issues in implementation. Given that the cost of capacity is not included in the price this can mean that capacity costs are not recovered. This may require a mark-up on the SRMSC price. Similarly under SRMSC prices there might be an incentive for the infrastructure manager not to expand capacity (thereby ensuring a large amount of congestion and a large revenue income). Price caps may therefore be needed.

There is some attraction to average social cost pricing (ASC) in that it is understandable to the public. However, modelling studies suggest that ASC prices across all modes would be highly inefficient. Road prices would fall massively and the network would become highly congested, rail prices would increase eliminating much of the existing traffic. The status quo is much more efficient than ASC prices.

In the discussion a number of specific points were made:

- A categorisation of prices also includes the terms first best, second best and target orientated. LRMSC and SRMSC are first best prices. SRMSC prices adjusted with a mark-up or a price cap (to prevent the infrastructure manager charging excessive prices) could be categorised as second-best prices. Target orientated prices, as the name suggests are prices that aim to achieve a particular target (e.g. pay for infrastructure, reduce emissions to achieve environmental target, etc.);
- The Eurovignette has a pricing strategy that would be categorised as long run average cost pricing. Only infrastructure costs are included and prices are set to the average cost.
- From an efficiency perspective mark-ups above either LRMSC or SRMSC on freight transport and business traffic (intermediate goods) should be avoided;
- There were some comments that the public are not stupid and are able to comprehend many different pricing structures. ASC may therefore hold no advantage over SRMSC and LRMSC in this area
- The majority of the discussion has been about congestion and adding capacity. Would the conclusions be different if there were excess capacity?
- The Eurovignette directive is treated almost as a minimum standard. Some member states are going beyond it (e.g. charging vehicles that are not covered under the directive). Any recommendations to the EC should bear this in mind.

General comments on draft policy conclusions

To the outside reader it is not clear as to whether the draft conclusions apply to all modes or just some. Possibly conclusions that apply to all modes could be

complemented by those that apply to individual modes. It is also not clear as to whether the conclusions are part of or independent of the report. Ideally each conclusion should focus on a single point (e.g. can each conclusion be given a title?).

There are always contentious areas – e.g. revenue use. Should surplus revenue go to the same mode or a competing mode, etc. Where possible the draft conclusions should therefore emphasise guiding principles. For example a guiding principle on revenue use could be that it should reduce external costs.

The draft conclusions are typically quite transport centred, whilst the EC has a broader remit on mobility for competitiveness and for social issues. A transport pricing reform involves an income transfer to the state. What the state does with the money is important for competitiveness. The speed at which money is returned by government is important. Firms are concerned about their costs increasing, but they can at least pass the costs on to their customers. Passengers cannot do so, and therefore the pricing has the characteristic of a labour tax which is not popular at elections. Users also understand value for money, it is therefore difficult for them to understand the concept that they need to pay more for a worse level of service – as occurs with SRMSC prices.

With respect to earmarking it is unpopular with governments for a mixture of reasons including the issue of subsidiarity. One can recommend stringent appraisal of projects across the public sector, but it is impossible to recommend how governments should spend their money. There is also mistrust between governments hence the reason why the Eurovignette directive exists.

With direct charging for transport it makes sense that if infrastructure is to be financed it should be financed firstly from congestion charges. Some borrowing may be necessary to smooth the impact of congestion prices going up and down as new capacity becomes available. Institutions separate from the state have a role in the operation of the transport pricing and revenue use system. These institutions should take on any project risk (e.g. project being poor).

In the New Member States (NMS) there are many variations between states as to the pricing structure in use. There is also a degree of ‘institutional chaos’ in the role of different institutions in the management of the transport system. Interestingly there is a much higher incidence of earmarking of tax revenue in the NMS than there is in pre-2004 member states. Issues specific to NMS regarding the implementation of a pricing reform include the following. There is a lack of data on infrastructure and external costs in the NMS making it difficult to know what a fair price is. Politically there is also no appetite for setting first best charges which may be high. Part of the reason for this is that purchasing power differences between the NMS and the pre-2004 states mean that prices in the NMS may appear higher than in pre-2004 member states (all other things being equal). There is also a degree of commonality between the pre-2004 member states and the NMS in that there exists a tension between earmarking revenues to the transport sector and the political desire to be free to direct revenue to any chosen sector. Tensions also exist between a simple tariff structure and a complex tariff structure. A complex tariff structure is more efficient but is more expensive to administer and

potentially confusing. A tariff structure could vary by time of day and by infrastructure type.

It was argued that there is a shortage of the necessary skills in NMS to implement pricing reforms, although the point was made that there are top quality engineers and technicians in NMS and also in the developed EU countries. This is a problem in itself, as these professionals are frustrated as to how things are run now. Maybe there also are competent economists. European consultants also need much improvement in the application of their expertise - in technical skills and in working with the client. The EU also needs to begin supervising its consultants more closely and not pay until an acceptable product is received.

It was argued that in the first instance surplus revenues should be returned to the mode from which they came. Taking roads as an example: under MSC pricing roads can be self-financing as they typically exhibit constant returns to scale. This would imply that all revenue generated from roads should be put back into the road sector if there are sufficient good projects. This would be something that appeals to the road stakeholders. It was questioned that if surplus revenue exists (e.g. there are not sufficient good roads projects) why any surpluses need to be directed to other transport modes (e.g. rail, air or water). Alternatives such as lowering labour taxes or contributions to other sectors of public spending need to be considered and maybe more efficient than directing revenue to other transport modes.

Whilst SRMSC pricing is efficient it is not universally accepted. There is a body of opinion that considers that if total revenue is greater than total costs then the transport sector is being 'overcharged'. That is there is a body of opinion that would only accept ASC pricing. Some of this acceptability problem for SRMSC pricing stems from the fact that road users can feel discriminated against. As for example they already 'pay their way' and are therefore suspicious of government motives to raise more revenue from them. The SRMSC pricing principle therefore appears to some stakeholders as a 'convenient' theoretical argument which has been latched on to by government. The principle of SRMSC pricing is therefore considered to act as a screen for the government's real agenda - which is to raise money for the budget.

There need to be clear benefits associated with an introduction of transport pricing. One area where transport pricing reform has a clear role is in reinforcing land use policy. From a wider economic perspective there is no political will to reduce productivity. Transport pricing therefore needs to increase productivity and surplus revenues should be used to increase the attractiveness of the most productive areas and to improve quality of life.

The introduction of transport pricing raises a number of principal/agent issues. For example, in the UK local authorities are the agents who promote the charging. This generates a particular set of issues including the ability to demonstrate that transport charge revenue is additional. This can be difficult as transport project funding is discretionary – each authority is not given its own transport budget instead projects are funded on a 'competitive' basis. There also exists a path implementation problem as the government may fund the construction of the infrastructure that becomes available

immediately before the transport pricing reform is implemented, but then a change in political control within the local authority may result in the charge being delayed, altered or not implemented. Principal/agent issues also exist in ensuring that an infrastructure agency is effective. Regulation of the agency will be critical. There is a lot of uncertainty in how such an agency should be regulated, due to a lack of precedents. What does seem clear is that cost-benefit analysis will be essential in ensuring transparency in funding decisions.

Specific comments on draft policy conclusions¹²

1. *Transport taxation is an important source of revenue for governments to meet social objectives. It is therefore infeasible for governments to set transport taxation and charge receipts equal to expenditure on transport investment and operating costs.*

It was suggested that economic and environmental objectives needed to be added to social. Also a number of members of the group argued that road taxes should be spent on roads. The question was raised: Why should the road users pay for the social objectives? Even if the road taxes were so used in the past, this is a mistake and its long-term consequences should be acknowledged. In fact, the use of road user taxes for social objectives is one cause of the present transport problem of inadequate capacity. It was also argued that transparency is required regarding what proportion of road user taxes are collected for social purposes, what tariff is paid and collected for roads and its externalities, and what is collected for cross-subsidizing other transport modes.

2. *A new pricing scheme should only be introduced if the objectives of the scheme meet the needs of society, is superior to the present pricing scheme, and its objectives cannot be met more easily by other forms of transport measure. Revenues need to be allocated transparently, alternative methods of travel need to be provided and fairness needs have to be considered very carefully. The benefits of the scheme should also be conveyed in an objective manner that focuses on the traffic and other problems and solutions people perceive as helpful.*

It was suggested that this conclusion raised too many issues, whilst at the same time being vague. It made no reference to transport policy or roads policy. What does ‘needs of society’ mean? How to improve mobility for the economy is a key issue and to achieve this pricing needs to be part of the package. Acceptance is also an issue. but it was argued that a new pricing scheme is a necessity, if for no other reason than the growing number of electric and hybrid vehicles, for which fuel tax is an inadequate way of charging. If the “alternative methods of travel” services that are to be paid for from the road user charges (or taxes collected to meet social objectives), then the “needs of the society” must be articulated clearly. Subsidies for (urban) public transport services or for the railroads (infrastructure and services), are usually subsidies to the supply side:

¹² It should be noted that some of the comments reported here were received by email. This part of the meeting note should be interpreted within this context.

drivers, operators, other support personnel, vehicle manufacturers, public entities, bureaucracies, etc. The fairest subsidies—clearly the elderly, the young, and the handicapped need to be considered fairly—are user side subsidies.

3. *As a means of raising additional revenue new infrastructure charges should be based on marginal social cost. That is the charges should differentiate by vehicle type, level of congestion/scarcity, type of infrastructure and time of day. Such a differentiated charge, on top of existing taxation levels will improve efficiency as well as raise funds for investment where it is justified. A complete replacement of existing taxes with such a pricing strategy in all sectors (not only transport) would be the most efficient reform, but this is not realistic as a pre-condition for transport pricing reform.*

Again this conclusion raises a number of points, all of which are contentious. It implies that new charges should be on top of existing ones, to which a number of group members were opposed.

It implies a very complex pricing structure. But it then dismisses the possibility of comprehensive reform in the last sentence.

4. *The charges may need to depart from marginal social cost in some circumstances, including: to prevent step-changes in prices (as new capacity becomes available) and to ensure a higher degree of cost recovery when marginal social costs are less than average commercial costs. Regulatory measures will also need to be used (for instance a cap on average congestion charges at the capital and external cost of providing new capacity) to prevent a situation in which excessive prices are charged and inadequate capacity provided, except in cases where there are external benefits justify this*

This conclusion was supported by some of the groups as a sensible pragmatic approach, but others thought it vague (for instance, what are the external benefits referred to?) and leaving too much discretion.

5. *Marginal social cost pricing is not well understood by the public, who are better able to understand average cost pricing. This therefore acts as a barrier to implementation. It is therefore essential to continue explanation and education that external costs of congestion and environmental damage are just as real burdens on economies as the traditional costs of labour, materials, etc. Research is needed to understand if there is a material difference in the charges derived from marginal social cost based pricing (with mark-ups, caps and smoothing) and charges derived from average cost based pricing (with top-up congestion charges and low traffic subsidies).*

Some thought this conclusion was useful and indicates the difficulties and the means of resolving them, others felt that the public could understand a broader range of issues than it implied. It was questioned why research needs were raised here but not in respect of other conclusions.

6. *Pricing and financing schemes need to be developed for whole networks and not for single links. Developing a scheme for multi-modal networks will be superior than developing separate schemes for each modal network.*

There was considerable support for this conclusion although it was thought to be difficult for some member states to implement. It was unclear whether “network wide” meant Europe-wide or referred to the network of a member state.

7. *There are efficiency advantages to a co-ordination of infrastructure prices across Europe, though remembering that where costs vary in different places, there is a prima facie case that charges should vary also. Member states are also interested in their own national tax revenues, and coordination of infrastructure charging may have implications for the legitimate balance of function between European and national roles. In resolving these issues, which are essentially political, it has to be remembered that cross border traffic is a varying proportion of national traffic in member states, and in most places local traffic is very much larger in terms of transport demand than long distance traffic.*

Again there were arguments for and against co-ordinating prices across Europe, whilst the conclusion was seen to be rather weak.

8. *Transparent earmarking of the infrastructure charge revenues to the transport sector will be necessary to achieve acceptability. Some form of income transfer (cross-subsidy) between regions, modes and class of user will also have to occur. It is quite infeasible to ensure that revenues are returned as investments to the exact location, individual and company where the charge was paid. Sensitivities exist between stakeholders regarding the exact form of income transfer. This forms a barrier to implementation and points towards context-specific solutions being developed. This makes it impossible to recommend a European wide solution to income transfer that satisfies the desires of all stakeholders. In some cases, the form of allocation of revenues will involve some or total tax neutrality (i.e. using extra revenues from new charges to reduce other forms of taxation), but new charges cannot be both tax neutral and earmarked to specific transport expenditures, as this would imply an increase in total taxation on other sources and an increase in total expenditure on transport: where this is justified, it should be*

done explicitly and deliberately as an act of policy, not as a by-product of pricing reform.

It was suggested that this was another long and complicated conclusion. Specific suggestions were made that only part of the revenue (e.g. 50%) should be earmarked for transport and there should be sufficient flexibility to avoid the need to spend money inefficiently just to meet the earmarking requirement.

9. *All investments made using revenues from charges must meet criteria of efficiency, environmental impact, and equity. (These allocations should be transparent, publicly reported, and subject to scrutiny, regulation and challenge by adequate political institutions.)*

This was seen as optimistic but a desirable goal. The question was raised as to how it may be pursued by institutional and reporting arrangements.

10. *A European infrastructure agency, aside from a coordinating role, should be confined to paying grants to national or local governments on the basis of clearly defined criteria (e.g. proportion of through traffic, or meeting environmental objectives, etc) related to effects within EU competence. The grants would relate to specific projects, or packages of projects, or policy interventions. The agency would not determine which projects should go ahead, this decision remaining with national or local governments or groups of such governments.*

Not everyone was convinced of the need for such an agency or that it should be paying grants. The source of its income was questioned and the need for matching funds stressed.

11. *National transport infrastructure agencies will assist in the efficiency and transparency of infrastructure planning. Objectives, strategies and decisions on major projects will always remain political and should be excluded from the role of such agencies.*


There is some support for this conclusion, but others argued strongly for more independence for infrastructure agencies from political control.

12. *At this moment in time it is felt that transport infrastructure agencies should be managed by the public sector. This is because there is a lack of research and evidence as to a successful form of regulation if a transport infrastructure agency were to be privately operated. There are arguably advantages to a transport infrastructure agency being managed by the private sector if this secures efficiency in management and ability to borrow from the financial markets. It would however need to be well regulated to maximise efficiency (including investment in new capacity) and minimise conflicts of interest between social and commercial objectives.*

It was suggested that the necessary research could only be undertaken if there was more experimentation into different forms of public and private agencies.

13. *Acceptability barriers present the single biggest obstacle to the introduction of a pricing reform. There is important emerging research on the dynamic nature of acceptability, the influence of the implementation path on acceptability, the role of referenda and the interactions between different stakeholders and published opinion/media or lobby groups.*

It was suggested that the conclusions on adaptability and on phasing should be separated and expanded. On acceptability, timing, transparency and the role of a champion were crucial. On phasing, gradual implementation is preferable.

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Annex VI: Revenue Use Schemes in New Member States

Executive Summary

Revenue use and allocation practice in New Member States (NMS) are generally different. Incoherency between NMSs and EU15 (furthermore US) situation provides interesting research topics: is there an ultimate solution for optimal revenue allocation in road sector, is it useful to transfer approaches from EU15 to NMS, how do we compare differing circumstances in these regions?

These topics are of primary importance for implementing pricing reforms. This paper tries to provide useful information about current pricing and revenue use practices in NMS. General differences are well-known but getting know the function of national systems can contribute interesting details for drawing up some evidence on this region.

7. Introduction

This paper is prepared for the IMPRINT-NET project's Workpackage 6 and its Expert Group 6 on Revenue Use. This review provides relevant information about current practice of road pricing and revenue use in relevant EU New Member States. Aims of the study are to systematise the different country approaches and to find consensus regarding the best revenue use scheme.

Methodology of this study is based on the one developed in REVENUE project. The classification of road pricing and revenue use schemes was in need of findings about regulatory framework, institutional aspects, pricing and revenue use policy, supervision of compliances and private participation.

After collecting information on national experiences and lessons in the NMS region, selection of countries was driven by having a relevant large geographical scope and having the most interesting schemes in operation. Different geopolitical roles (peripheral or transit location) led forming of two country groups: Baltic states and Central and Eastern European states.

At the end of this paper conclusions and summary are partly based on results of current research work and partly on results of previous projects such as TIPP, REVENUE and FUNDING.

References are various national reports, EU studies and research reports, presentation materials from national and international workshops and conferences.

8. Baltic States

8.1. Estonia

8.1.1. Regulatory framework for funding

Since 2003 the calculated amount of funding for national roads is upon preparing the state budget considered to include all sources of financing – as it is stated in the Annual Report of Estonian Road Administration from 2006 (ERA, 2006):

- public revenues in State Budget (from fuel excise duty),
- European Union's assistance (subsidies and loans) and
- own incomes over expenses of the road offices from market business activities.

The division of funds for the management of national and local roads between construction sites and road works and other expenditure necessary for road management shall be approved by the Government.

Several laws in force regulate the assessment of special road taxes, relevant ones are the Road Act, the Fuel Excise Duty Act, the Motor Vehicle Excise Act, the Heavy Goods Vehicles Tax Act and the Local Taxes Act.

The regulations on direct user charges are differing from the general rules of other new member states. In the Road Act it is stated that when road construction permits for toll roads are issued it is taken into consideration that a road user must be able to reach the required destination by a non-toll road. However there are exceptions e.g. when crossing a bridge. A toll road may only be constructed as a new structure. It is more general that the costs of managing a toll road shall be borne and the fee for use of the road shall be established by the owner of the road.

The issuer of a road construction licence may establish road construction requirements and road use requirements on the owner of a toll road, a term for use of the road as a toll road and the procedure for settlement of road disputes. In the Road Act there are no detailed descriptions of form, structure and principles of a future potential pricing system for toll roads.

8.1.2. Institutional background

The Road Act (January, 2006) regulates the institutional responsibilities, it states that the road management shall be organised by the owner of the road. The road administration shall organise the management of national roads and is required to create the conditions for safe traffic on such roads. Rural municipalities and city governments shall organise the management of local roads and are required to create the conditions for safe traffic on such roads. Owners of private roads shall organise the management of roads in the ownership thereof and are required to create the conditions for safe traffic on such roads.

The Estonian road network is divided into two main categories and five sub-categories. The main categories and the relating sub-categories are as follows:

- national roads (16.479 km): main roads, basic roads, secondary roads;
- local roads (40.546 km): municipal roads, private roads.

In Estonia there is an institution of the Estonian Road Administration (ERA) which is a government agency under supervision of the Ministry of Economic Affairs and Communications. Its area of activity covers:

- organising road management and creating conditions for safe traffic on the roads in the state ownership;
- organising road management and creating conditions for safe traffic on the roads in the state ownership;
- participating in the development of the legislation regulating the ERA's area of activity and making recommendations for amending and supplementing legislation, including improving Estonian terminology;
- participating in the development of policies, strategies, and development plans in the ERA's area of activity; preparing and implementing projects in the ERA's area of activity, including participating in the preparation and implementation of international projects.

There is a regional road administration (for state-maintained roads) and a couple of road offices (for privately maintained roads on basis of a contractual agreement) operating as state agencies under the administration of the ERA. Road offices contract for road maintenance works, conduct maintenance in their respective areas of location and may perform any other works stated in their statutes. The main functions of these organisations include:

- organising supervision over the management of national roads and creation of the conditions required for safe traffic;
- managing national roads on the basis of the road management plan and the approved budget;
- administering national roads and other state property transferred into the possession of the road office;
- ensuring conditions required for safe traffic on national roads;
- permitting, consenting, monitoring and approving activities of road operator;
- submitting proposals for preparing road management plans;
- consulting management of local roads and streets and private roads.

8.1.3. Pricing system

Presently there are no existing roads in Estonia with direct tolls.

On national level motorist shall pay fuel and motor vehicle excise duty. Fuel excise duty is imposed on motor fuel, lubricated motor oil and fuel oil produced in Estonia or imported into Estonia. Motor vehicle excise duty is imposed on motor vehicles imported to or built or rebuilt in Estonia. Vehicle excise duty is calculated on the basis of duty rates, the age of the vehicle and capacity of cylinders of the motor vehicle.

On local level there is a motor vehicle tax imposed by the regulations of rural municipalities or city councils.

8.1.4. Revenue use policy

Road management in Estonia covers:

- road operation, maintenance and reconstruction,
- real estate operation and maintenance,
- acquisition of machineries and vehicles, technologies,
- planning and design,
- land surveying,
- traffic education of society.

Considering revenues from fuel excise duty, the Road Act (January 2006) provides the regulatory framework for road management in Estonia. There is a yearly road management plan by the Government which underlies the financial issues of the national road network. The maximum limit for expenditures is stated by the official prognoses of revenues from fuel excise duty. This marked fund is part of the state budget. Its limit is defined by the sum of 75% of general fuel tax revenue plus 25% of special marked fuel tax.

The distribution of available financial resources from fuel tax for the management activities on national and local roads is specified in the state budget for each year. Before 2006 maximum 5% of the upper defined maximum amount was allocated for financing investments on the local road network, in 2006 its value was 10%, since 2007 this limit is 15%. Consistently, the remaining part of the fund is allocated for the national road network. Overview of the realised and predicted expenditures is shown in Table 2.1.

Table 8.1 Revenues and expenditures in road sector in Estonia

[m EUR ¹³]	2005	2006	2007	2008	2009	2010	2011
Fuel tax revenues	216	236	257	294	336	388	417
Expenditures on local roads	11	17	28	32	37	43	46
Expenditures on national roads	147	154	160	182	209	242	260

Source: Karjane, 2007

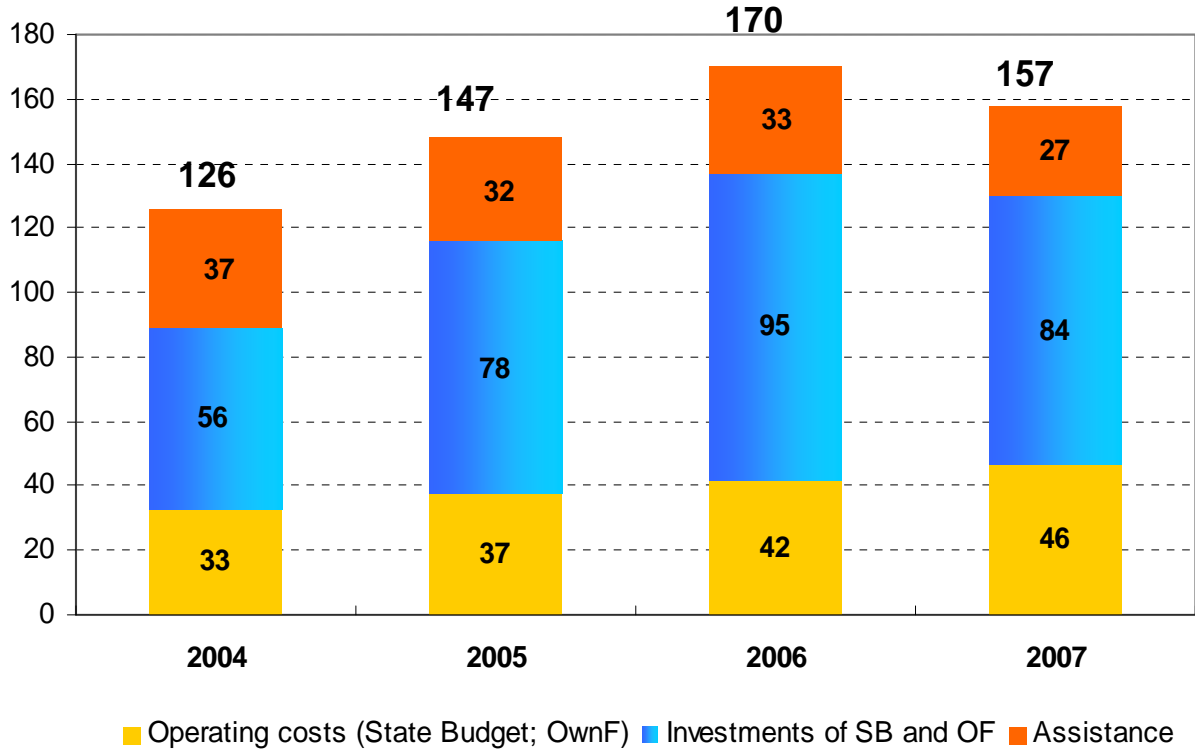
The available financial resources of the Fund are applied to finance road infrastructure projects. The European Regional Development Fund (ERDF) and other EU sources are available for co-supporting / financing repairs and construction of national roads. For the EU budget period of 2004-2006, 28 million EUR (17 million EUR by ERDF) were allocated for development of the transport infrastructure. The share of EU financing is 75% of the value of the project, with Estonia's co-financing making up the remaining 25%. The basis for the utilisation of foreign assistance is the strategic plan "Projects financed by EU in 2002-2007" approved by the European Commission and the Ministry of Finance. In case of the utilisation of foreign assistance it is necessary to guarantee co-financing from the state budget. EU subsidies may be used in the amount of up to 85% of the project value for roads of the TEN-T network.

Financing of national roads in Estonia is detailed in Figure 2.1.

¹³ ECB exchange rate (19 Nov 2007): 1 EUR = 15,65 EEK

Figure 8.1 Financing of national roads in Estonia

FINANCING OF NATIONAL ROADS in 2004 - 2007, MEUR



Source: Karjane, 2007

8.1.5. Supervision of compliances

ERA is responsible for exercising state supervision over the compliance with the requirements established by legislation regulating the ERA's area of activity and, where necessary, applying enforcement powers of the state. Furthermore, besides ERA the Police Board and the owner of the road shall take responsibility of organisation and monitoring in adherence to the rights and obligations set out in the Act. Police officers and officials authorised by the Minister of Economic Affairs and Communications have the right to prepare precepts for the elimination of violations of the Act and legislation issued on the basis thereof with regard to all roads, and authorised officials of local government councils have the right to prepare such precepts with regard to roads in the ownership of the corresponding local governments.

8.1.6. Impacts of PPP initiatives

There is two possible PPP project in Estonia:

- the Tallinn – Tartu road link (45 km);
- the Saaremaa (bridge) fixed link.

There are several conceptions for building the financial construction for the upper projects, the PPP variant calculates with a DBFO (Design-Build-Finance-Operate) solution, applying direct (bridge) or shadow tolls (road).

In Estonia the establishment of institutions responsible for the guidance of PPP projects is in the project phase. These institutions shall accumulate best practices and statistics and provide consulting on the implementation of PPP projects.

8.2. Latvia

8.2.1. Regulatory framework for funding

Until year 2004 there was a separate State Highway Fund in Latvia for financing the highway investments, improvements of other infrastructure was funded by the State Budget. However, from 2004 all special funds in Latvia have been eliminated and the funds were incorporated in the State Budget, among these also the fund for the programme of state highways.

The supports from European funds (ERDF and CF) are part of the financing mechanism on general conditions.

For PPP initiatives the following legal framework exists already:

- Concession Law;
- Public Procurement Law.

There is another act in preparation called Contractual Public Private Partnership Law, which aimed to:

- define PPP, PPP contract, PPP resources, public partner;
- provide two types of PPP contracts: concession contract and availability contract (DBFO, RFO etc. contracts);

- determine that competitive dialog (competitive dialog will regulate Public Procurement Law) should be used only for complicated projects;
- provide step in rights of financial institution and to
- define compensation mechanism.

8.2.2. Institutional background

The Ministry of Transport takes responsibility for administration and management issues of state highways. However, in the Law "On Highways" it is allowed for the Ministry to delegate this duty to the state owned joint stock company "Latvian State Roads". This company performs the management of the state road network, administration of the incorporated "State Road Fund" and organisation of public procurements. Since October 26, 2004, the company is a state joint stock company that operates according to Company Statutes and the Agreement "On Road Sector Management" signed with its main client – the Ministry of Transport of the Republic of Latvia.

Tasks of the Latvian State Roads are:

- implementing the counting, registration, management and protection of state roads;
- preparing the strategy for state road network preservation and development;
- administration of the state road financing;
- organising public procurements in the road sector;
- organising and controlling road network design, construction, repairs and maintenance;
- preparing legal acts of the branch and control their implementation and
- co-ordinating traffic safety organisation on roads.

8.2.3. Pricing system

The Latvian motorist shall pay fuel tax and vehicle tax (this latter depends on weight of vehicle).

There are presently no tolls on roads in Latvia.

8.2.4. Revenue use policy

The provided highway programme's financing for each year shall not be less than as follows:

- the sum of planned state budget revenues from the yearly vehicle duty;
- the 80% of the planned state budget revenues from the fuel excise duty;
- the amount of assigned financing in the previous year.

8.2.5. Supervision of compliances

The Latvian State Roads Co. supervises the construction, maintenance and protection of parish, company and household roads. The responsibility for operation of the Latvian State Roads Co. is taken by the Ministry of Transport. The overall control of used funds and of the used road financing system is performed by the State Audit Office.

8.2.6. Impacts of PPP initiatives

(This chapter is mainly based on Burgiené et al., 2006.)

There are plans to use PPP models in reconstruction and development of inter-urban and bypass road sections. However, as there are no alternative roads to this one, it is anticipated to use a different scheme of financing - the state will pay to a private contractor/operator an annual availability payment for providing the road.

The responsibility for PPP projects has been assigned to three main institutions:

- the Ministry of Economics, which is responsible for creating proper legal framework, developing PPP policies and coordinating their implementation;
- the Latvian Investment and Development Agency (LIDA), a state agency which elaborates the required methodology, implements PPP projects, draws up proposals to facilitate PPP development, and supports the implementation of PPP projects;
- the Procurement Monitoring Bureau of the Ministry of Finance, which provides monitoring of public procurements.

The Ministry of Economics plans to create an Advisory Board on PPP issues and set up a PPP web site which will include interpretative materials, laws and regulations, methodology and guidelines, standard documents, current events, executive updates,

information from abroad and useful links. The Ministry also plans to organise informative seminars for public institutions on the methodology behind the PPP project management cycle and on standard documents necessary for the development of PPP projects.

LIDA carried out research on five pilot projects submitted by municipalities. LIDA also plans to develop methodology on the PPP project management cycle, to make frequent updates and to develop a standard agreement for PPP projects. To date, LIDA has developed a series of methodological materials, including a description of the PPP project cycle, recommended content for a standard agreement for PPP projects, an overview of the advantages and drawbacks of the most common PPP agreements and a questionnaire on the project concept.

In this respect, Latvia is ahead of the other two Baltic states in monitoring and providing guidelines for PPPs. Lithuania and Estonia have made no significant attempts to draw up guidelines or model agreements. However, this situation is expected to change in the near future, as Lithuania and Estonia make steps toward establishing institutions which will be responsible for the support and accumulation of best practices.

Forasmuch the lack of alternative roads is a general fact in the country, this is a bar to possible implementation of a direct tolling system in the near future.

8.3. Lithuania

8.3.1. Regulatory framework for funding

The Lithuanian “Law on the Financing of Road Maintenance and Development programme” establishes the sources and procedure for financing the Road Maintenance and Development Programme of the country. The purpose of this law is to accumulate and use funds for the expansion and modernisation of the road network and ensuring the operation.

The law determines that the financial sources shall be as follows:

- deductions from income (i.e. general income taxes);
- revenue from fuel excise duty;
- commercial vehicles taxes;
- user charges (vignettes);
- taxes for vehicles exceeding the permitted dimensions;

- charges levied for the restriction of traffic and
- targeted funds of legal, natural persons and foreign states.

The Government shall lay down the procedure for using the financial resources and designate the institutions for implementing this law.

The level of vignette price (not exceeding the marginal rates set in the law), as well as the procedure for the payment, calculation and control shall be laid down by the Government.

The supports from European funds (ERDF and CF) are part of the financing mechanism on general conditions.

8.3.2. Institutional background

The Lithuanian Road Administration has a couple of regional departments and a motorway department “Automagistrale” on national level.

8.3.3. Pricing system

In Lithuania motorists are obligated for paying fuel tax (depending on consumption) and vehicle tax (in fixed yearly amount).

Owners or users of buses and heavy vehicles registered in Lithuania shall pay the user charge for driving on the main and national road network from 1 July 2007. The user charge shall not be paid for driving on regional roads and local roads.

The vignettes shall be obtained at petrol stations, at border crossing points or on other places marked by special signs.

Presently the level of user charges (or Vignette tariffs) in LTL¹⁴ are as illustrated below in Figure 2.2:

¹⁴ ECB exchange rate (19 Nov 2007): 1 EUR = 3,45 LTL

Figure 8.2 Financing of national roads in Estonia

Vehicle	Description	Amount of charge (LTL)			
		Daily rate	Weekly (7-day) rate	Monthly (30-day) rate	Annual rate
Buses					
M2	Vehicle comprising more than eight passenger seats plus one driver's seat and having a total weight not exceeding 5 tonnes	20	60	150	600
M3	Vehicle comprising more than eight (but not more than 22) passenger seats plus one driver's seat and having a total weight of 5 tonnes or more (inclusive)	20	60	150	900
M3	Vehicle comprising more than 22 passenger seats plus one driver's seat	20	90	180	1600
Goods vehicles and their combinations					
N1	Up to 3.5 tonnes (inclusive) total weight	20	60	150	600
N2	From 3.5 tonnes to 12 tonnes (inclusive) total weight	20	90	150	900
N3	From 12 tonnes to 40 tonnes (inclusive) total weight	20	90	180	1600
N3	Total weight not exceeding 44 tonnes where 40 foot containers (conforming to ISO standards) are carried by a three-axle tractor and two- or three-axle semi-trailer	20	90	250	1900
N1	Up to 3.5 tonnes (inclusive) total weight, when owners of vehicles are agricultural entities	20	40	80	600
N2-N3	From 3.5 tonnes to 16 tonnes (inclusive) total weight, when owners of vehicles are agricultural entities	20	40	80	900
Special road vehicles	Designed for performing specific operations but not for the carriage of goods	20	40	100	900

Note: none of the user charge tariff can be divided

Source: http://www.lra.lt/en.php/about_lra/general_information/101

8.3.4. Revenue use policy

There are clear descriptions and definitions of allocation of funds to the Programme.

The road programme financing resources shall be used for road purposes e.g. for designing, constructing, building, modernising and reconstructing. The resources shall be used on the basis of the annual estimate of funds approved by the Government. The annual estimate of funds shall include a provision for a reserve of up to 5% of the programme financing resources with a view to financing road-related public needs. The amount of allocated revenues and expenditure of the programme shall be planned in the State Budget in compliance with the principles of special programme financing laid down in the Law on the Structure of the Budget.

Formerly 40% of the revenue from the fuel excise duty should be transferred to the programme financing; from 1 May 2005 the share increased to 50% and from 1 January 2006 it is 60%.

Further, in Article 11 of the Law on the Financing of Road Maintenance and Development programme it is stated that the Programme financing resources shall not be used for financing other public needs which are not provided for in Article 10 of this Law.

8.3.5. Supervision of compliances

Procedures for control are clearly defined. The implementation of the law on financing road infrastructure programme shall be controlled by the permanent Commission for the Road Maintenance and Development Programme. The Government shall approve the composition and regulations of the Commission.

8.3.6. Impacts of PPP initiatives

(This chapter is mainly based on Burgiené et al., 2006.)

Currently in Lithuania there are no PPP initiatives in the road sector, otherwise a number of pending concession granting procedures in other fields, like construction, maintenance and operation of a tramway line, renovation and maintenance of schools and provision of primary health care services. All of these initiatives are being implemented at the municipal level. One of most important factors driving the municipalities towards concessions is the municipalities' limited ability to borrow and fund projects by way of traditional procurement.

The parliament of Lithuania recently adopted amendments to the Law on Concessions whereby it allowed the establishment of a single institution which would be responsible for the provision of methodological support for concession projects. In addition, the Ministry of Finance launched a separate initiative and established a special unit which is responsible for the fiscal supervision of PPPs. However, this institution does not produce products which would facilitate PPP type investments, such as policy guidelines or plans of areas which would be good for PPP type investments.

9. Central and Eastern European States

9.1. Poland

9.1.1. Regulatory framework for funding

In Poland the Act of 16th December 2005 on land transport infrastructure financing details the most relevant rules for building fiscal funds for development and operation of road network.

The following financing sources are available:

- State Budget Fund;
- National Road Fund;
- European Regional Development Fund and Cohesion Fund.

The Act regulates the general principles of financing the construction, modification, repair, maintenance and protection of public road infrastructure and its management, but it is not in force in case of paid motorways. These tasks shall be financed by:

- the General Director of National Roads and Motorways in relation to national roads (18.237 km);
- the voivodship self-government in relation to voivodship roads;
- the district self-government in relation to district roads;
- the municipalities in relation to local roads.

According to the Act, the Minister of Transport¹⁵ may transfer part of the resources for the acquisition of properties designated for the construction of paid motorways. If the relating financial resources lack in this case the Minister shall determine the percentage amount of the transferred share of resources (up to 20%), taking into consideration the implementation of the motorways construction programme and the investment progress status.

Other relevant acts in force are the following:

- the Ordinance of 8th August 2006 of the Minister of Transport on the vignettes;

¹⁵ On 16 November 2007, the Council of Ministers issued the Ordinance on establishing the Ministry of Infrastructure, and repealing the Ministry of Construction, Ministry of Maritime Economy and Ministry of Transport. Therefore, the newly established Ministry of Infrastructure is the legal successor of Ministry of Transport at all points.

- the Act of 30th June 2005 on Public Finance;
- the Act of 2nd July 2004 introducing freedom of economy changing the Act about Toll Motorway and National Road Fund;
- the Act of 20th April 2004 on National Development Plan;
- the Adjustment of 14th November 2003 to The Act about Toll Motorway and National Road Fund;
- the Act of 10th April 2003 on special rules of preparing and realization of the investments concerning the national roads;
- the Ordinance of 14 December 2001 of the Minister of Infrastructure on the fees charged to transport operators using national roads;
- the Act of 6 September 2001 on road transport;
- the Act of 27th August 1997 on public roads financing;
- the Act of 27th October 1994 about Toll Motorway;
- the yearly Budget Act.

9.1.2. Institutional background

Since 1999 the public road network has been classified into four administrative categories. National roads are the property of the State Treasury, whereas the voivodship, district and local roads are the property of the local governments of the appropriate level.

The national road network development programme is carried out by General Directorate for National Roads and Motorways (GDDKiA) and special purpose road companies. The Parliament passed the Act on Special Purpose Road Companies on 12 January 2007 defining the Special Purpose Road Companies (SSP) which will allow to maximise a hitherto potential for road construction as a consequence of the implementation of road projects in a traditional way, i.e. by way of General Directorate for GDDKiA, and by way of Public Private Partnership. SSP look for sources of financing, preparation, implementation, and then operation of motorways and expressways, determined by the Ministry of Transport in agreement with GDDKiA. In addition, SSP make efforts for a more competitive road building market and help small and medium-sized companies of the road building sector develop faster. The establishment of SSP companies started in 2007, the total number of SSP will depend on their effectiveness.

9.1.3. Pricing system

The main income sources for the National Road Fund are:

- fuel taxes;
- vignette charges;
- paying interest on Fund's sources;
- incomes from holding and selling shares;
- fees collected by GDDKiA;
- payments settled up by concessionaires;
- incomes from rent buildings purchased in order of running the investments;
- fees for specification preliminary tender condition;
- loans drawn on behalf of National Road Fund and
- incomes from fine papers.
- incomes from obligations emitted on behalf National Road Fund by National Economy Bank (BGK).

Vignette charges for the use of national roads by motor vehicles are payable by domestic and foreign firms using road transportation for profit or for their own needs if the vehicle has a permitted total weight in excess of 3,5 tons or is designed to carry more than 9 persons including the driver. The above does not apply to entities that are not entrepreneurs but are included in the public finance sector. The obligation to pay a road charge does not apply to:

- entrepreneurs who carry out road transport by means of a taxi,
- toll motorways,
- intermodal transport,
- public communication,
- sheltered workshops or vocational development centres.

Table 9.1 Vignette prices on the Polish national road network

Car type (permissible total weight)	Fee in PLN							
	Daily		Weekly		Monthly		Yearly	
	Gas emission standards							
	EURO 0/1	EURO 2 or more	EURO 0/1	EURO 2 or more	EURO 0/1	EURO 2 or more	EURO 0/1	EURO 2 or more
3,5-12 t	9	8	30	28	75	70	500	450
More that 12 t	27	27	88	75	275	250	2500	2100

Source: <http://www.gddkia.gov.pl/>

There are two direct toll motorway sections in Poland:

- A2 (Krakowice – Krakow; 61 km);
- A4 (Swiecko – Konin; 136 km).

The motorway toll scheme was introduced in April 2000. Different operators employ different systems and charge different fees on each motorway. However, there are usually five vehicle categories, differentiated by number of axles and vehicle weight. There are bulk discounts for frequent users.

There are plans on implementing electronic fee collection in 2011 at the earliest. The planned distance based fees concern only vehicles of total weight above 3,5 tonnes, i.e. the ones which were charged with the vignette charge. The fee will contain a couple of factors, including cost of construction and operation of road infrastructure, and social acceptance. It is the Council of Ministers which will decide on the fee rate. The fee does not concern those charges collected on the toll motorway sections operated at present. Passenger cars will not be charged with the electronic fee. There will be a price-cap in force for setting the maximum level of charges.

9.1.4. Revenue use policy

The expenses related to the construction, modification, repair, maintenance, protection and management of land transport infrastructure, financed or co-financed by the Minister of Transport, shall be provided for in the Budget Act in the amount not lower than 18% of the revenues from motor fuel excise duty planned for the given year.

The budget act for the year 2006 provided, that for expenses related to national roads, the amount should not lower than 12% of the revenues from motor fuel excise duty

planned for the given year, as mentioned in Article 3 of the Act of 27 August 1997 on public roads financing.

Road tolls are collected by the concessionaires, who transfer them into the national road fund. In 2006, the concessionaries received compensations of 111 m EUR¹⁶ what meant 73.8% receipts from the vignette charges. To continue the operation of the system, it will increase the compensations so much that it will exceed the receipts from the vignette charges.

9.1.5. Supervision of compliances

GDDKiA is supervised by the Ministry of Transport.

9.1.6. Impacts of PPP initiatives

Since 1997 three major motorway projects have been carried out in PPP scheme. Formerly the decision-makers' concept was that these toll motorways can be constructed and operated more quickly and effectively than the state owned ones. Due to the quite low purchasing power of potential users and due to the unbalanced risk sharing between the public and private shareholders these concepts had been changed. The Ministry of Transport decided on withdrawing from former concession agreement, taking over the construction of that section; reasons for the decision were high unit costs of construction and high tolls.

Recently the Ministry of Transport does not have any plans concerning more motorways built in form of public private partnership. According to earlier settlements, two motorway sections will be built in PPP, but the rest of the sections will be built in a traditional way by GDDKiA as an investor or by special purpose companies.

9.2. Czech Republic

9.2.1. Regulatory framework for funding

¹⁶ ECB exchange rate (19 Nov 2007): 1 EUR = 3,67 PLN

There is a couple of financial and administrative regulations concerning the funding of road infrastructure in the Czech Republic.

Recently the framework for PPP initiatives has been created with the Act No. 139/2006 on Concession Contracts and Concession Procedures (Concession Act) and Act on Public Contracts No. 137/2006 which came into force in July 2006. The Act No. 92/1991 on conditions for transfer of state property to another persons as amended by the Act No. 92/1992, No. 264/1992, No. 541/1992, No. 544/1992, No. 210/1993, No. 306/1993, No. 224/1994, No. 27/2000 and No. 220/2000 regulates the possible payment mechanisms.

Financial sources from taxation are regulated by Act No. 212/1992 on system of taxes as amended by the Act No. 302/1993, by Act No. 16/1993 on road (vehicle) tax as amended by the Acts No. 302/1993, No. 243/1994, No. 143/1996, No. 61/1998, No. 241/2000, No. 303/2000, No. 492/2000 and No. 493/2001.

The rule for using available road funding is detailed in the Act No. 243/2000 on budget destination of several tax revenues to the territorial self-governing units and to several state funds (Budget Destination of Taxes Act) as amended by the Act No. 492/2000 and No. 483/2001.

The subject of motorways and high-speed roads to a fee is regulated by Act No. 13/1997 on the Road Network. The fees are set by the Government Directive No. 484/2006 which came into force in January 2007.

The available resources for financing road infrastructure expenditures are the followings:

- State Transport Infrastructure Fund (revenues from fuel excise duty and vehicle taxes);
- EU funds (ERDF and CF).

9.2.2. Institutional background

These are the elements of the Czech road network:

- motorways (633 km)
- expressways (331 km)
- other national roads (54.952 km)
- local roads (72.927 km)

The head of the road administration is the Ministry of Transport based on Act No. 2/1969. The Ministry is the central authority for matters involving transportation, which is responsible for the creation of the country's transportation policy, and is responsible, within the sphere of its powers, for its implementation. In case of road user charges competent authorities are the Ministry of Transport and the Ministry of Finance.

The Road and Motorway Directorate of the Czech Republic is the investor and manager of motorways (633 km), expressways (329 km) and other class I roads (5.843 km). The organisation has its headquarters in Prague and apart from the General Directorate there are another two motorway branches in Prague and in Brno, 13 Regional Road Administrations and 16 Motorway Administration and Maintenance Centres.

The Association for the support of public and private sector was established in the Czech Republic in 2004 ("PPP Association") supporting and developing the area of investments and services supplied for the public sector in form of PPP.

"PPP Centrum" was formed on the 1st of July 2004 under authority of the government decree owned 100% by the Ministry of Finance. Its role is speeding up preparation, elaboration and implementation of legal environment and methodological procedures for PPP initiatives in the Czech Republic.

9.2.3. Pricing system

Two elements of the Czech pricing system are revenues from collecting fees and tolls on the motorway and expressway sections and revenues from taxation.

There is a mixed motorway and expressway charging system in force in the Czech Republic. Since 1 January 2007 motor vehicles with a permissible total weight of 12 tons or more are obligated to pay distance-based toll charges in frame of electronic tolling system. Other vehicles remained in the vignette system (operating since 1995).

The prices of motorway vignettes are detailed in next Table 3.2.

Table 9.2 Motorway vignette prices in Czech Republic

[in EUR ¹⁷] Total weigh/ Period	Yearly	Monthly	Weekly
<= 3,5 t	34	11	7
> 3,5 t and <12 t	262	66	24

Source: <http://www.mdcz.cz>

Toll rates for motor vehicles and combinations with a permissible total weight of 12 tons or more are shown in the following Table 3.3.

¹⁷ ECB exchange rate (19 Nov 2007): 1 EUR = 26,69 CZK

Table 9.3 Motorway toll levels in Czech Republic

EURO std.	EURO II			EURO III and higher		
No. of axles	2	3	4<	2	3	4<
Toll rate (EUR/km)	0,09	0,14	0,20	0,06	0,11	0,16

Source: <http://www.premid.cz>

There is a two-part taxation system in force:

- fuel excise duties;
- vehicle taxes.

The rate of vehicle tax shall be defined by

- for passenger cars: hoisting capacity of engine;
- for trailers: sum of the maximum approved loads of axles in tons and the number of axles;
- for other vehicles: maximum permissible weight in tons and number of axles.

Engine's EURO standard and type of use of vehicle are special weights in the tax calculation.

9.2.4. Revenue use policy

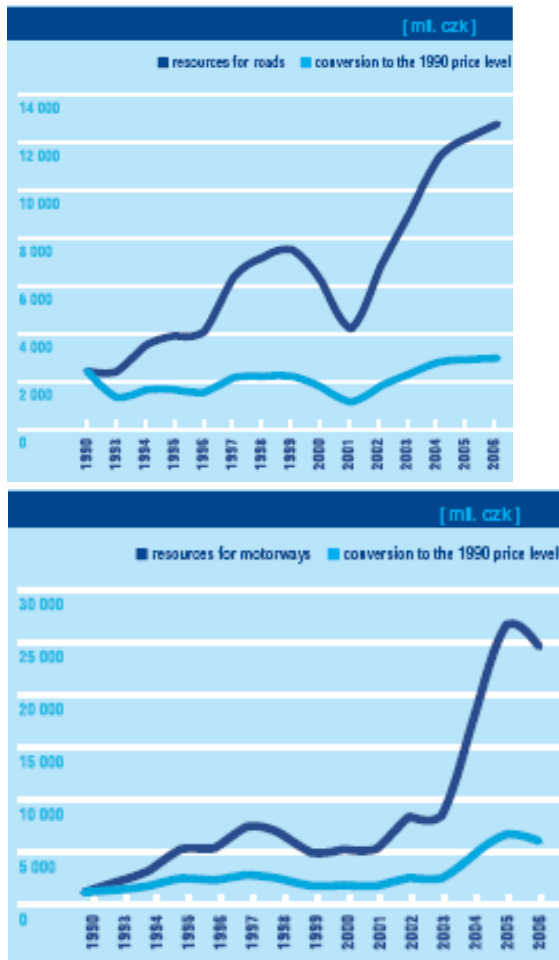
The tax income of the State Transport Infrastructure Fund shall consist of

- the gross revenue from vehicle taxes;
- 20 % of the gross revenue from fuel excise duty.

The revenues from the toll and vignette systems are received also by the State Transport Infrastructure Fund.

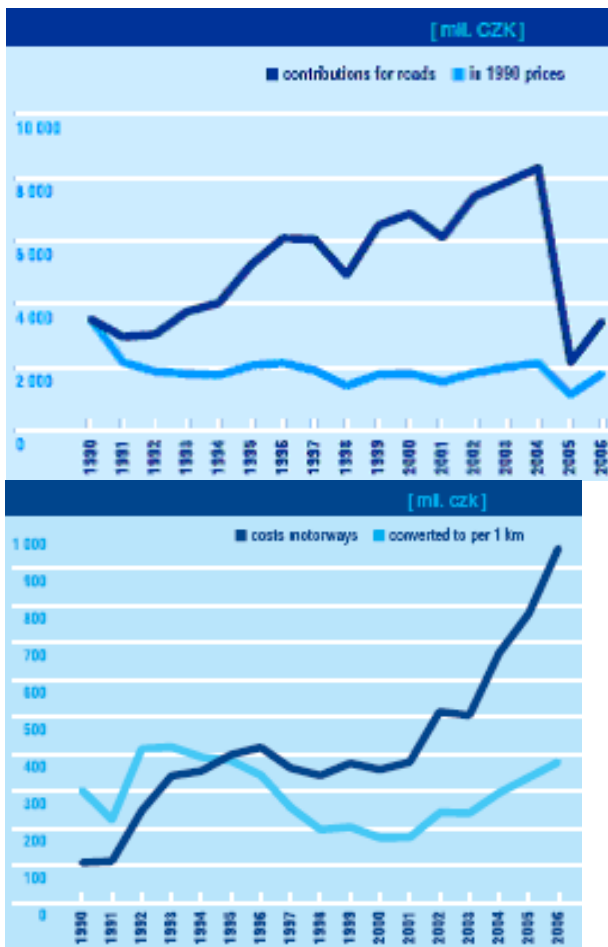
The State Transport Infrastructure Fund suffered from underfinancing in the last few years, but the country's join to the EU has opened new funding sources. During 2007 the Ministry of Transport considerably increased the available budget for reconstruction, maintenance and operation activities. Among these activities the construction of motorway network has the biggest share in total expenditures and its intensity is relatively larger year by year.

Figure 9.1 Total yearly expenditures for a) Road and b) Motorway construction in Czech Republic



Source: RMD, 2007

Figure 9.2 Total yearly expenditures for a) Road and b) Motorway operation and maintenance in Czech Republic



Source: RMD, 2007

9.2.5. Supervision of compliances

The Ministry of Transport is responsible for executing state administration and professional state supervision in subject of road network and the asset management and preparation of programmes for the development of motorways and 1st class roads (including expressways) managed by the Road and Motorway Directorate.

Members of supervisory board of “PPP Centrum” are the Ministry of Finance, the Ministry for Regional Development, the Ministry of Finance, the Ministry of Labour and Social Affairs, the Office of the Czech Republic Government and the Law Office of Mgr. Liliana Vochalova.

9.2.6. Impacts of PPP initiatives

The development of the PPP framework has priority in the Czech Republic, aiming transfer of knowledge from the private sector to the public one. The Government's decision No. 7/2004 of 7 January 2004 ("Policy paper on PPP") stands for standardising PPP instruments for ensuring the quality of the provision of public services and public infrastructure.

The Ministry of Finance launched the "Twinning" project in order to

- increase efficiency of public investments in the infrastructure and the operation and management of public services as part of the Czech Republic public finance reform;
- develop the PPP methodology and standards; supporting the introduction and implementation of PPP policy as a part of legal business environment in the Czech Republic.

As a result (according to recommendation of the World Bank) the PPP Centre has been established in order to support the coordination and preparation of PPP approaches and consulting the ministry and other public authorities on key PPP decisions. The Centre is exclusively sponsored by the public sector.

The construction, maintenance and operation of the 30 km Tabor – Bosilec section of the motorway D3 is carried out in PPP form. The private sector bears key risks – construction and availability risks –, the public one takes over all risks of project preparation, land purchase and traffic demand. The state will pay yearly availability fee in combination with shadow tolling.

9.3. Hungary

9.3.1. Regulatory framework for funding

The Act No. I/1988 on road transportation states that the State is responsible for central administration of road transportation. The frames of required financial sources are laid down in the Ministry Ordinance No. 8/2008 of 18 March on rules of utilising earmarked targets for road funding and providing management of national road network of Ministry of Economy and Transport.

The Act. No. CXXVII/2003 on excise duty and special rules of trading excise products and the Act No. LXXXII/1991 on vehicle tax created the basis of motorists' taxation.

Regarding private capital's involvement into road investments, a series of act was approved by the Parliament, providing a safe legal background for the preparatory works of private provision of road infrastructure: Act No. XVI/1991 on concessions and Act No. XXXVIII/1992 on State Budget. In Act No. CXXVIII/2003 on public interests and development of motorway network of Republic of Hungary, the state expresses its special interests on improvement of the motorway network especially with constructing sections of the TEN-T network, involving also private capital into the investments.

9.3.2. Institutional background

There is a three-level institutional system in road administration. The Ministry of Economy and Transport stands on the top of the system, it's role is professional controlling the transport sector, elaborating the transport policy and supervising the national road network.

According to the institutional requirements of the EU's Cohesion Fund the former system had been changed to meet the requirements. The mid-level professional co-ordination is responsibility of the Co-ordination Centre for Transportation Investments (KKK). The co-ordination tasks include asset management and relating preparations and contracting of maintenance activities, contracting with the National Infrastructure Development Corporation (NIF) on providing investments and supervising operation of NIF, contracted road operators and concession companies. Furthermore, KKK prepares and submits financial reports on utilised fiscal funds. Concerning the EU's financial supporting process this organisation provides the national Intermediate Body's tasks as well.

The operative level has five different organisations:

Three of them are state-owned institutions:

1. NIF is liable for the development and monitoring of public road and railways investments.
2. On the state-owned motorway network, the operator (carrying operation, maintenance and administration tasks) is the State Motorway Management Company (ÁAK).
3. Other parts of the national road network is operated and maintained by the Hungarian Roads Company (MK).

There are two concession motorways in operation:

4. Motorway M5 (approx. length is 190 km) is operated by Alföld Koncessziós Autópálya (AKA) where the Hungarian State is a minority owner with 40% share.
5. Motorway M6's concessionaire is M6 Duna Autópálya (M6DA) operating about 86 km of motorway.

The Hungarian road network's elements are the following:

- motorway, expressway (1.320 km with/1.040 km without junctions)
- national roads (29.800 km)
- local roads (105.000 km)

9.3.3. Pricing system

The motorist shall pay the following taxation means:

- fuel excise duty;
- vehicle tax.

There is different regulation for passenger cars and other vehicles in subject of vehicle taxation. Passenger car owners pay vehicle tax according to engine power, owners of other (mainly commercial) vehicles are obligated to pay depending on weight of vehicle.

The vignette system on the motorway network was introduced in 2000, except on several sections and the M0 by-pass at Budapest. From 1 April 2007 there were a couple of changes implemented in the vignette system. Motorcyclists become entitled to access motorways by using electronic payment (the fee will equal the half of the motorway vignette's price of category D1 valid for 4 days, between 1 May 1 and 30 September). New validity period (1-day sticker) has been introduced for categories D2 and D3. Also from this date, payment obligation has been extended for vehicles over 3,5 tons accessing motorways or semi-motorways that were free of motorway fee before April 2007. Exception remains the M0 by-pass. Another important change is that vehicles over 12 tons must purchase vignettes when using 500 km of designated sections of main road network.

The Hungarian vignette system currently recognises four vehicle categories, based on maximum permitted vehicle weight. Vignette price calculations are not based on the damage caused or costs engendered by motorway traffic. Prices vary depending on the

time of year. The vignette prices (in EUR¹⁸) for 2007 are shown in the following Table 3.4. (Prices are set according to the Eurovignette Directive, data may due to differing exchange rates.)

Table 9.4 Vignette prices in Hungary

Validity / Category	1-day	4-day	10-day	31-day	Annual
D1	—	6/5*	10	17	146
D2	12	—	26	50	419
D3	12	—	40	71	625
D4	12	—	52	89	861

* *Reduced price between 1 May and 30 September*

Source: <http://www.autopalya.hu>

Vehicle categories:

D1: Motorcycle, and vehicles with a permissible maximum weight of 3.5 tons with all kinds of trailer. D2: Vehicle over 3.5 tons and with a maximum permissible weight of 7.5 tons, and a combination of a vehicle and a trailer (combination of vehicles).

D3: Vehicle over 7.5 tons and with a maximum permissible weight of 12.0 tons, and a combination of a vehicle with a trailer.

D4: Vehicles over 12 tons.

Whilst the concession companies do not receive any direct revenue from the vignette system, they get annual availability fees from the state for operation and maintenance of motorways. (Financing private profits of these investments during the concession period are also part of the arrangements.)

9.3.4. Revenue use policy

Briefly history of the budget resources of supports and credit instalments:

- Road Fund until 1998 separated from the State Budget;
- Road maintenance and development earmarked target between 1999 and 2000;
- High speed earmarked target between 2000-2007;
- Separated motorway and national road earmarked targets from 2007.

¹⁸ ECB exchange rate (19 November 2007): 1 EUR = 254,23 HUF

There is no direct earmarking of fuel tax revenues, revenues from fuel taxes come into the State Budget. Vehicle taxes are incomes for local municipalities.

The motorway and national road earmarked targets are aggregations of:

- annual financial support from the State Budget set by the Ministry of Finance;
- revenues from vignette sales;
- utilisation of available land properties;
- other financial loans and supports.

Generally these supports do not reach the required amounts for sustaining the service level on the national roads (except on motorways). After expert's opinion the rate of utilising revenues in the road sector is about 20% in Hungary.

The availability fees for the concessionaires are also funded from the State Budget from specific separated funds.

9.3.5. Supervision of compliances

Setting the vignette prices is responsibility of the Minister of Economy and Transport in Hungary. The KKK is a public body, it is strongly controlled by the Ministry. The MK and the ÁAK are independent companies established by the Ministry. The government is planning to privatise the so far state-owned road operators aiming at enhancing the efficiency of road administration. Utilising revenues from taxation are regulated by the Ministry of Finance. The total state fiscal mechanism is monitored by the State Audit Office of Hungary.

9.3.6. Impacts of PPP initiatives

There are several approaches in the history of PPP projects in Hungary in the last 15 years. In the 1990s the general form of PPP initiatives was the concession form, first with minimal state contribution (only in preparatory steps), all other tasks and risks were allocated to the concessionaire (e.g. motorway M1/M15). Due to the low purchasing power of potential users and the off-falling revenues, the concessionaire bankrupted and the Hungarian State took over the motorway. At next generation of concession form the concessionaire and the state shared the risks of the investment and gave payback guarantees on commercial loans (motorway M5). The risk allocation scheme was the following (Table 3.5):

Table 9.5 Risk allocation scheme in PPP initiatives in Hungary

Category	Concessionaire	Public stakeholders
Political risks	change in acquis and tax regulation - general	termination, change in acquis and tax regulation – specific, appropriation, convertibility of currency
Construction risks	quality of plans, cost overrun – due to others, timetable and quality of works, delay due to licensing procedures, disruption from construction	land acquisition & transfer, quality of plans, cost overrun – due to modifications by procurer, delay due to licensing procedures, archaeological exploration
O & M risks	environmental impact, force majeure, technological impact, cost overrun	environmental impact, force majeure, change in regulation
Commercial risks	insufficient traffic volumes/revenues	insufficient traffic volumes/revenues, control of price mechanism, new competitors
Financial risks	change in inflation/interest rate, increasing financial costs, bankruptcy	change in inflation/interest rate/foreign exchange rate
Legal risks	legal contest	legal contest, covering necessary licences for smooth operation

Source: Tánczos et al., 2004

Analysing the industry characteristics and concession agreements, the following risk control methods were used for allocation and mitigation:

- political risks: political risk insurance, compensation by the terms specific to the concession;
- construction risks: fixed price, turn-key contract with fixed date for completion and penalties clauses, the public side ensured the land acquisition and archaeological exploration and the existing section to date;
- operation and maintenance risks: agreement defines levels and standard of service provided, additional bypass road construction because of diverting traffic financed by the State;
- commercial risks: standby type operational subsidy denominated in HUF but linked to EUR, guaranteed by the State by beginning of 2004 in case of insufficient traffic volumes, restricting HGV traffic on alternative roads, and own toll policy of concessionaire with discount system (partly supported by the State);
- financial risks: rates are automatically escalated according to domestic CPI and/or the exchange rate differential, fixed interest rates to a certain extent;
- legal risks: according to the Hungarian Civil Code.

The only problem was – similarly to the M1/M15 case – that the applied toll rates were too high for the potential users. Parallel with negotiations between the company and the State, serious negotiations were run between the municipalities of involved settlements and the Ministry of Transport. The target was to define technical solutions to decrease the negative consequences of the increased traffic. As a consequence, the Ministry undertook some additional bypass road construction, erection of noise protection walls and traffic lights, creating new pedestrian crossings, changing hundreds of windows and some road rehabilitation. These additional financial burdens on the State should have been added to the State contribution to the project. These negotiations were cancelled after relevant changes in the life of the concessionaire. On 12 March 2004, the State and the private investors signed the new Concession Contract, which states that the Hungarian State Motorway Company became a minority owner in the AKA Rt. with 40% share. The aim was to change the charging system, the former semi-open toll system to the vignette system, which system has been enlarged this way to the whole Hungarian motorway network. The aim of this step was to have a unified toll system in Hungary.

During the years of EU integration process, the country's financial conditions changed:

- increasing amounts of available EU funds;
- growing economy;
- narrowing state funding due to the Maastricht criteria.

These circumstances forced the state upon to revise the existing PPP methods. The state needed to decrease its project risks and transfer them into long-term financial exposures. This is the case of motorway M6. The state financed preparatory works and provides toll collection, but all other costs shall covered by the concession company return for monthly availability fees.

9.4. Romania

9.4.1. Regulatory framework for funding

(This chapter is based on Larive, 2007.)

The awarding process of investments in concession form is regulated by Government Emergency Ordinance No. 34/2006 of 30 June 2006 concerning the award of procurement agreements and of concession agreements for public works and services;

The concession contract is regulated by Act No. 219/1991 regarding concession regime, as amended by Act No. 528/ 2004. According to the provisions of this law, the object of concession contracts may include: public activities and services of national and local interest, other remunerated services, assets under public or private property. Granting a service or a public good in concession is performed in compliance with the principles of transparency, equal treatment for all bidders, non-discrimination, proportionality and free competition. The maximum concession term is 49 years.

Act No. 219/1991 indicates the goods and services that may be subject to concession. The concession may be granted using specific methods that ensure the transparency and the fair competition among the participants. The procedure most frequently used is public tender, which may be:

- open or
- open with pre-selection procedure.

The public private partnership is a new concept in Romanian legislation brought by Ordinance No. 16/2003, as subsequently amended by Act No. 470/2002, Emergency Ordinance No. 15/2003, Act No. 293/2003 and Act No. 528/2004. The public private partnership is a contract having as object the execution, or both the design and the execution of one or several construction works, corresponding to the requirements of the contracting authority. In exchange for the works performed, the contracting party, in its capacity of grantee, shall receive the right to exploit the result of the works, either in full or in part, for a determined duration. Public-private partnership contracts raised

interest and have so far been used in Romania only with respect to large scale projects where expertise of strategic partners was required.

The most relevant regulations on the vignette system are:

- Government Ordinance No. 15/2002 concerning the introduction of the tariff for use of the national roads network in Romania;
- Act No. 424/2002 for the approval of the Government Ordinance No. 15/2002;
- Order of the Minister of Public Works, Transport and Housing No. 1433/2003 regarding the approval of the Methodological Norms for the application of the tariff of the use of the national roads network in Romania;
- Order of the Minister of Public Works, Transport and Housing No. 286/2003 regarding the amendments and completions of the Methodological Norms in order to apply the tariff for the use of national roads network in Romania, approved by the Order No. 1433/2002 of the Minister of Public Works, Transport and Housing;
- Government Ordinance No. 51/2004 for the modification and supplementing of the Government Ordinance No.15/2002, published on 28 July 2004 (aiming relatively fast falling into line with European standards about toll rates);
- Act No.415/2004 regarding the approval of the Government Ordinance No. 51/2004 for the modification and supplementing of the Government Ordinance No. 15/2002, published on 1 November 2004;
- Order of the Minister of Transport, Construction and Tourism No. 2230/2004 for the modification and supplementing the Methodological Norms regarding the application of the tariff for the use of the national roads network in Romania, approved by the Order of Minister of Public Works, Transport and Housing No. 1433/2002, published on 28 December 2004.

The vehicle taxation is regulated by Act No. 343/2006 on the fiscal regime.

9.4.2. Institutional background

The Ministry of Transport is responsible for creating adequate legislative framework, policy and development strategies for the fields of transportation, elaborating development programmes of the transport infrastructures and provides administration and top-supervision of the transport sector. The ministry has budgetary and extra-budgetary units, autonomous administrations, national companies, trade companies functioning under its subordination, coordination and authority.

Other relevant ministerial central bodies are the Ministry of Administration and Interior (public procurement regulation) and the Ministry of Public Finances (monitoring and enforcing fiscal regulations).

The National Company for Motorways and National Roads (NCMNR) (its former names were “Road Department” and “National Administration of Roads in Romania”) responsible for planning, constructing, funding and controlling the national road network. Maintenance of the national road infrastructure is organised under 8 regional directorates (DRDP) of the NCMNR. The annual routine maintenance and rehabilitation activities have been commercialised and now they are publicly tendered for each intervention.

There are three administrative levels in the road administration in Romania:

- national roads (14.500 km) managed by NCMNR;
- county roads (36.000 km) administered by the county council;
- local roads (58.000 km) administered by the local municipalities.

9.4.3. Pricing system

There are two main taxation means for motorists:

- fuel excise duty (regulated by the government) and
- vehicle tax (regulated by local municipalities).

Vehicle tax is payable by owners of vehicles registered in Romania. The tax depends on the engine capacity.

There are no direct tolls for using motorways in Romania, except the sections containing bridges over the Danube.

The vignette system (“Rovinieta”) is operating on the national road and motorway network since 1 July 2002, in the first half years only for goods vehicles over 12 tons, from 2003 also for goods vehicles over 7 tons, from 2004 also for goods vehicles over 3,5 tons. In 2005 the system was also extended for passenger cars. The vignettes are sold to foreigners for the periods of 1, 7, 30 days, as well as 6 or 12 months. Romanians can only buy the vignette for one year. The prices are set up according to the driving period, respectively, the stay or parking period, the number of axles and the exhausting gas emission in EURO standard.

Yearly vignette prices for passenger car users (max. 3,5 tons):

- EURO 0: 90 EUR

- EURO 1: 78 EUR
- EURO 2 and more: 60 EUR

Vignette prices for other vehicle categories are detailed in Table 3.6.

Table 9.6 Vignette prices in Romania

All prices are expressed in EUR			
Vehicles from 3,5 to 7 t			
Time	Euro 0	Euro 1	Euro 2 - 3
1 day	4,80	3,80	3,00
7 days	16,80	13,80	10,80
30 days	60,00	54,00	45,00
6 months	180,00	150,00	120,00
1 year	240,00	228,00	210,00
Vehicles from 7 to 12 t			
Time	Euro 0	Euro 1	Euro 2 - 3
1 day	4,80	4,20	3,60
7 days	18,00	15,00	12,00
30 days	63,00	57,00	51,00
6 months	330,00	294,00	258,00
1 year	540,00	480,00	420,00
Vehicles above 12 t, max 3 axles			
Time	Euro 0	Euro 1	Euro 2 - 3
1 day	5,00	5,00	5,00
7 days	19,00	17,00	15,00
30 days	69,00	61,00	54,00
6 months	346,00	306,00	270,00
1 year	576,00	255,00	225,00
Vehicles above 12 t, 4 or more axles			
Time	Euro 0	Euro 1	Euro 2 - 3
1 day	5,00	5,00	5,00
7 days	31,00	28,00	25,00
30 days	112,00	101,00	90,00
6 months	558,00	504,00	450,00
1 year	930,00	840,00	750,00

Source: ECG, 2007

9.4.4. Revenue use policy

In recent years the road management's most important problem were lacking financial sources for maintenance works and ineligible management procedures in the administration. Romania launched a programme on rehabilitation and upgrading of national roads to standards compliant with EC Directive 96/53 on weights and dimensions. The programme was co-financed by international financial institutions (World Bank, EIB, EBRD), the State Budget and EU Funds (PHARE, ISPA and SAPARD). Concession and PPP approaches offer also additional resources in funding road investments.

Fuel tax and vignette sales are the main national sources for funding. In State Budget the Road Fund receives 45 % of the fuel excise tax. This fuel excise tax income is shared between national (65 %) and county roads (35 %). The Road Fund income covers administrative expenses, routine maintenance, loan service payments, and limited rehabilitation costs of the national roads.

While revenues from fuel taxes are part of the State Budget, vignette and toll payments are directly addressed to the NCMNR providing cover to maintenance expenses. The annual revenue to the NCMNR from these sources is therefore about 120 m EUR per year, and is supposed to cover most of the road expenditures. (The estimated total cost for the national road network is above 200 m EUR/year.) The NCMNR is also forced upon supports from the State Budget and commercial loans from the fiscal market in order to fill-in the gap in financing maintenance, rehabilitation and construction works.

Over the past decade NAR has secured grants (EU-ISPA) and several loans from International Financial Institutions (the World Bank, EIB, EBRD) guaranteed by the state, to upgrade its main road corridors. The Government is actively pursuing new external IFI financing or Public-Private Partnerships to further upgrade the main roads and improve RNCMNR institutional capacity. RNCMNR's multi-year Highway Development Program and a multi-year Highway Rehabilitation Program are both primarily funded through loans and grants. The communal road network has recently begun receiving support from EU's SAPARD program and the World Bank's Rural Development Project.

9.4.5. Supervision of compliances

The Ministry of Transport supervises all the national and commercial companies being under its authority. The NCMNR has economic administration and – theoretically – financial autonomy, but e.g. sets vignette prices based on Government's decision; it has reporting on the Ministry's hands.

9.4.6. Impacts of PPP initiatives

(This chapter is mainly based on The Region, 2007.)

The PPP approach has been introduced to Romania. For planning such an initiative there is a detailed regulation on types of projects, relevant procurement procedures, pre-feasibility and feasibility studies, negotiations and standards for agreement. The concept is that the public assets are contributed to a Project Company as a joint venture between

the Authority and the private investor. The contribution has two ways: lease or concession.

The investor is liable for contributing financial, technical and management resources to the Project Company. Any public assets resulting from the project may not be sold or used as security issue during the life of the project. The Project Company is exempted from several taxation payments.

Another way for involving private capital is the concession form. The motorway A3 is a concession project in North-Transylvania within Romania. The “Autostrada Transilvania Project” is a four-lane, 415-kilometer motorway, stretching northwest from Brasov in central Romania to Oradea on the country's border with Hungary. The concession contract (without any call for public procurement) was signed between the Government and the American Bechtel Company in 2003. The project’s fiscal plans defined a 415 km of newly constructed motorway for 2200 m EUR, but the original plans had not been based on appropriate pre-feasibility studies. Due to some accounting problems on advance payments, the preparatory works had been hung up for 2 years from 2005. After 4 years of signing the concession contract the expected final total amount is about 7000 m EUR.

There is another concession motorway project planned as being a Northern by-pass road of Bucharest.

General objective is that the tolls on such roads shall not exceed the purchasing power of users but shall meet the requirements for revenues of the private investors.

9.5. Bulgaria

9.5.1. Regulatory framework for funding

For preparing the implementation of PPP project the Government of Bulgaria introduced necessary legal provisions and promulgated the Concessions Act (2 May 2006, effective 1 July 2006), complementarily with the provisions of the Roads Act, No. 26/29.03.2000, art. 11 to 17, and the Public Procurement Act (4 April 2004) on the Implementation of the Concessions Acts (4 July 2007, effective since 1 July 2006).

9.5.2. Institutional background

A well-developed and maintained road infrastructure provides the foundations for the country's economic growth and sets the preconditions for development of the road transport. The National Road Infrastructure Fund (successor of the Road Executive Agency as of 12 August 2006) is the institution responsible for the general management of the national roads in Bulgaria (motorways, I, II and III class roads). The implementation of various projects co-financed under EC will be fulfilled by the "Implementation of EU Funded Projects" Directorate. The strategic planning will be done by the "Planning and Control of the Road Infrastructure" Directorate – a newly established structure to the Ministry of Transport aimed at elaboration of concepts, mid- and long-term programs for road infrastructure development, making analyses jointly with the respective directorate to the Ministry of Regional Development and Public Works of the information on the municipal road network and coordination of programs for its maintenance and development, thus achieving integrated maintenance and development of the complete road network.

The functions of the Fund are laid down in the Road Act, last amended in August 2006. In compliance with the Road Transport Law adopted in 1999, the Executive Agency "Road Transport Administration" within the Ministry of Transport was established and currently performs the administrative service and control of the national and international road passengers and cargoes transport on the territory of the Republic of Bulgaria.

Table 9.7 Motorways in Bulgaria

Condition	Trakia motorway (km)	Hemus motorway (km)	Mariasa motorway (km)	Kalotina-SOP Hemus motorway (km)	Ljulin motorway (km)	Cherno More motorway (km)	Stuna motorway (km)	Total (km)
Project length	361	456	117	90	19	103	156	1.302
In operation	221	162	5-complited 20 (left carriageway)	12		8		331
Under construction	22	15	21				18	76
Planned for the period 2007-2014	118	279	91	78	19	95	138	818

Source: <http://www.mtc.government.bg/index.php>

9.5.3. Pricing system

The adopted amendments of the Roads Law with regard to the implementation of the vignette system for collecting charges for use of the Bulgarian road infrastructure both for Bulgarian and EU carriers (31 January 2004) have given the legal basis for further alignment with the European legislation (Directive 62/1999/EC for the charging of heavy goods vehicles for the use of certain infrastructures and its revision the Directive 38/2006/EC). The law foresees that the charges' rates for Bulgarian and foreign registered vehicles will be made equal as of 1 January 2007. Secondary legal acts are Decree No 50/ 2 March 2004 of the Council of Ministers for amendment of Tariff No 14 for the fees levied within the system of the Ministry of Regional Development and Public Works and by the regional governors (12 March 2004), Decree No 57/12 March 2004 of the Council of Ministers for adoption of the Ordinance on the terms and procedure for collection of vignette charges related to paid use of specified national roads within specified period of time (23 March 2004) and Decree No 321/30 November 2004 for amendment of Tariff No 14 for the fees levied within the system of the Ministry of Regional Development and Public Works and by the regional governors (07 December 2004). The list of national roads subject to charge for using of road infrastructure and the structures subject to charge according to Article 10, Paragraph 4 of the Roads Act was approved by Decision of the Council of Ministers No 945/1 December 2004. Thus the complete legal basis was created.

On 1 January 2005 commenced the second phase of the vignette system, embracing the last road vehicle category, namely road vehicles for transportation of passengers with up to 8 + 1 seats.

The last stage of the vignette system was developed in 2006. As of the beginning of 2007 equal vignette rates are applied to both foreign and Bulgarian registered vehicles, thus fulfilling the requirements of Directive 62/1999/EC toward non-discrimination in terms of the nationality of the haulier or the registration of the vehicle, or origin or destination of the transport. A daily vignette was introduced thus fulfilling the commitment undertaken to the EC. At present daily, weekly, monthly and annual vignettes are sold for vehicles with more than 8 seats and freight vehicles with 2 or more axles.

The rates of the vignette charges are in conformity with the requirements of Directive 62/1999/EC and the new Directive 38/2006/EC. The calculations of the infrastructure costs are made accordingly to the principles set forth in the two Directives. With a view to the consultations hold with the Bulgarian hauliers and having in mind the vastly increased financial burden to them in 2007 compared to 2006, the rate of the vignette charges is considerably lower than those economically justified in the study of the consultant. During technical consultations the respective EC authorities were informed

for the structure and rates of the applied tariffs. It is important to be noted that the rate of the charges is differentiated with respect to the costs caused by the road vehicles and meets the requirements of Directive 62/1999/EC. Pursuant to Article 44 of the Roads Act in force the income of the vignette charges shall be used for maintenance and improvement of the vignette road network only and not for new construction.

Complete transposition of Directive 38/2006/EC in the Bulgarian legislation is forthcoming so as to be effective as of 2008.

As of the moment of its implementation till now the vignette system is successfully operating based on well developed network of about 3.500 sales points all over the country. The vignette stickers are distributed by the units of the Road Executive Agency (Central office in Sofia, 27 Regional Road Administrations and sales points at all Border Crossing Check Points), the branches of “Bulgarian Posts” and DZI Trans. The revenues from the vignette system in 2004 was about 20 m EUR¹⁹, and in 2005 - about 69 m EUR. The forecast revenues for 2007 are about 92 m EUR.

The charges were collected in Ministry of Regional Development and Public Work system. The current vignette network coincides at large extend with the National Road Network (NRN), the total length of the latest being 19.276 km. Exempted of vignette charges are the NRN sections in residential areas, suburbs and some of the cities and by-pass roads, as well as the Sofia Ring Road.

From 1 January 2007 the vignette charges for domestic and foreign shall be equal.

Table 9.8 Vignette prices in Bulgaria

Vignette prices			
CATEGORY/DURATION	C1*	C2*	C3*
Daily	10	10	
Weekly	56	33	5
Monthly	153	87	13
Annual	485	256	34
*Fines are in euro			

C1: Construction machines and tractors

C2: Smaller construction machines, vehicles with more than 8+1 seats designed for passenger transport

C3: Vehicles with up to 8+1 seats designed for passenger transport

Source: <http://www.rta.government.bg/>

Motorist shall pay annual vehicle tax and fuel excise duty in Bulgaria.

¹⁹ ECB exchange rate (19 Nov 2007): 1 EUR = 1,96 BGN

9.5.4. Revenue use policy

The introduction of vignette system aims to guarantee the funding for maintaining the national roads, but not to cover the whole expenditure for the road infrastructure. It is one of the tools for providing of income for maintenance of the vignette road network. The State Budget is also a source for supplying of funds for this purpose. The Budget is supported by 100% of fuel tax incomes. In case of disasters and accidents the National Road Infrastructure Fund will get additional funds for fulfilment of necessary repair works. At present jointly with Dutch experts a modern Road Management System is under elaboration. It will contribute for the more rational and effective use of the funds available for maintenance. The elaboration of a price system allows dynamic change and sustainable funding of the road infrastructure.

Revenues from vehicle taxes are directed to municipal budgets.

9.5.5. Supervision of compliances

The toll charges have been collected in Ministry of Regional Development and Public Works. The Audit Tax Consulting AG, ATC Bulgaria Group conducts the control inside the country together with "Road taxes and permissions department" on CBC (Cross-Border Cooperation). The Road Executive Agency acts the leader part in the terms of payment and financing; calculation cost price; pricing, tariff and terms for performing transport.

9.5.6. Impacts of PPP initiatives

The total length of the planned motorways network is 1.302 km, to be constructed till 2014.

Projects meant for realisation via Public-Private-Partnership (Concession)

The "Trakia" motorway, with a total length of 188 km;

- Lot 2, Lot 3 and Lot 4 L = 118 km;
- Section of the Sofia bypass road–northern arc L = 22 km;
- The Kalotina – Sofia bypass road–northern arc section L = 48 km.

The "Hemus" motorway L = 280 km (needs to be finished):

- Lot 1 L = 58,8 km
- Lot 2 L = 85,1 km
- Lot 3 Section L = 101,9 km.

The "Black Sea" motorway L = 94 km

For preparing the implementation of the above mentioned project the Government of Bulgaria introduced necessary legal provisions and promulgated the Concessions Act (2 May 2006, effective since 1 July 2006), complementarily with the provisions of the Roads Act, No. 26/29 March 2000, art. 11 to 17, and the Public Procurement Act (6 April 2004).

10. Conclusions and summary

There is a quite detailed and well-developed regulatory background in the NMS, the reason is that road transport is of strategic importance within commercial and fiscal economy. The most important financial instruments for road network operation, maintenance and improvement are the State Budget, (inside or outside of the Budget) the Road Fund, EU funds, IFIs' loans and revenues from business activities.

The differences in road administration (number of levels, responsibilities, institution in charge) lead to differing pricing and revenue allocation approaches. E.g. where motorway and national road network is controlled by State owned national company or institution, country-wide tolling system is commonly used (e.g. Lithuania, Poland, Romania). In case of dispersed road administration, there is incoherency in roles, authorisation and responsibilities in the trans-national comparison.

Almost all countries apply road toll either on the motorways or on the whole national network (except Estonia and Latvia). HGV and bus transport are always subject of tolling (time duration dependent vignettes or mileage-based direct tolls), currently electronic toll collection system (for HGVs and buses) is only working in Czech Republic (initiatives are existing in other countries). Annual vehicle taxes and fuel excise duties are commonly applied in these countries.

While the average purchasing parity of national users is significantly lower than in the EU-15, incurring costs of development, operation and maintenance converge to the international level, therefore national stakeholders do not prefer direct tolls clearly based on incurred costs, rather make efforts to apply price-caps in setting road tolls.

Differences between costs and revenues tend to be financed from the State Budget in differing forms: shadow tolls (e.g. planned in Estonia) or availability fees (e.g. Hungary). Generally revenues from road tolls are earmarked for improving the national road network (where a Road Fund or Earmarked Target exists), but in some cases they are directed to the State Budget. Where PPP projects exist, tolls on roads are generally earmarked for financing these projects (regarding public operation: operation and maintenance, development (optionally); in case of private management: vide supra or definite availability fees).

Fuel tax incomes are generally earmarked (in variable percent) for infrastructure funds (except in Hungary), but revenues from vehicle taxes either go to State Budget or Road Fund or to local/municipal budgets.

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