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LEGAL AND INSTITUTIONAL
FRAMEWORK FOR MARGINAL
COST PRICING IN URBAN
TRANSPORT IN EUROPE

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EXECUTIVE SUMMARY

Background & objectives of the study (section 1)

1. A sound consideration of legal and institutional issues is likely to be critical to the successful introduction of marginal cost pricing for transport. This is particularly important in the area of urban transport pricing, because much of the organisational decision-making would need to take place at the local or regional level, where policy-makers may consider that broader legal and institutional issues fall beyond their professional remit. An important contribution of research is to specify any organisational and institutional features which may hinder progress and to motivate the will of politicians and professionals at the appropriate levels towards overcoming them.
2. This study is part of the EC DGVII AFFORD project. Project AFFORD (Aceptability of Fiscal and Financial Measures and Organisational Requirements for Demand Management) has investigated issues relating to the potential for implementing marginal cost pricing for urban transport within the European Union. In particular, it has considered the paradox that, while there is a strong body of opinion in economic theory that marginal cost pricing approaches would yield significant efficiency benefits, there has, to date, been little enthusiasm from real-world policy-makers for implementing them in practice.
3. This study has carried out a detailed analysis of the implementation of marginal cost pricing from a legal and institutional perspective. The objectives have been: (A) to identify and analyse the key features and critical aspects of the legal and institutional issues in relation to marginal cost pricing and to define the range and scope of these issues; (B) to develop a sound theoretical approach and framework for analysing the legal and institutional issues; (C) to assess the prevailing legal and institutional barriers affecting marginal cost pricing in urban transport in the European Union and beyond; and (D) to investigate the needs and prospects for institutional reform to encourage the implementation of marginal cost pricing in urban transport.

Previous work (section 2)

1. Much previous work – including a number of EU research projects – have investigated legal and institutional issues in relation to a range of transport pricing measures. This work has addressed these issues at varying levels of detail, but has not explicitly addressed them in the context of marginal cost pricing. The literature mostly consists of largely pragmatic accounts of detailed legal and institutional issues related to specific policy measures, undertaken as part of real-world feasibility studies and demonstration projects.
5. The literature dealing with the interaction between the legal and institutional issues and marginal cost pricing (principles) is vague and scattered. No other studies (to our knowledge) have specifically devoted to these issues in a marginal cost pricing context either. Perhaps closest to this come a few studies on the experiences in The

Netherlands related to the attempts to introduce marginal cost pricing in the Randstad area.

Theoretical approach for analysing legal and institutional issues (section 3)

6. Owing to the great multitude of issues covered, this study does not rely on any single theory. Rather, its approach is to draw together elements from several theories and disciplines, and in addition pay specific attention to practical location specific and often detailed issues which can be extremely important to the decision-makers. An important distinction is made between: (i) the approach to investigating the legal and institutional status quo; and (ii) the approach to investigating the institutional reform.

Analysing the legal and institutional status quo

7. The economic-theoretical foundation for the analysis of this study is provided by *neo-classical economics*. This is natural, as the theoretical basis of marginal cost pricing builds on neo-classical argumentation. Other important theoretical disciplines or traditions providing insights to the analysis are *institutional economics* (new and old) and *game theory*. However, all these theories are only affecting more or less implicitly behind the argumentation, as no formal models reflecting them will be presented. But this of course in no way undermines the importance of these abstract theoretical considerations to this study.
8. While the approach of this study builds on fundamental economic principles, it also extends the viewpoint to cover all relevant non-economic perspectives and academic traditions such as political, acceptability, etc. Many legal and institutional issues of marginal cost pricing in real-world are likely to fall outside the scope of the economic theory. The scope of the standard economic analysis is too narrow to meet all the requirements of policy-makers.
9. In addition, in practice, many legal and institutional issues may be extremely case-specific or microscopic, i.e. likely to greatly vary by site and thus to be suitable neither for abstract theoretical nor comparative empirical (economic and non-economic) analysis. This study will pay careful attention to such detailed practical aspects affecting the implementation of marginal cost pricing at the local level, which are endemic to real-world policy-making in an urban transport context.

Analysing institutional reform: economic welfare analysis

10. A major driving force behind any sensible plan to introduce marginal cost pricing must be the welfare benefits that might be available through it. Therefore, the analysis of legal and institutional barriers to marginal cost pricing and of a related institutional reform must ultimately include or be linked to quantitative *welfare analysis* (if not explicitly then implicitly at least). A highly relevant question from the viewpoint of reaching theoretically sound and realistic policy conclusions is the ability of the prevalent conceptual economic and applied real-world models –

focusing on optimising marginal cost based pricing measures and policies and estimating their welfare effects – to properly allow for the legal and institutional issues.

11. An intuitively appealing and sound theoretical basis for the quantitative welfare analysis is provided by the economic second-best theory (much of which, in turn, is based on neo-classical economics). In the applications of this theory, typically, the second-best cases represent true real-world situations, whereas the role of the first-best cases primarily is to serve as a benchmark only. A critical insight of this study is to consider the legal and institutional barriers as second-best constraints which (on their part) prevent the transportation system from achieving a fully optimal first-best state. Considering the legal and institutional issues within the framework of the second-best theory also links this study to the other AFFORD deliverables.
12. An essential part (though sometimes implicit) of any welfare analysis is the comparison between the best practice second-best and the first-best benchmark. The second-best constraints and distortions – here due to a range of legal and institutional barriers – always have, by definition, a negative welfare impact as compared to the first-best. The definition of a *first-best benchmark* is almost trivial in a stylised textbook model. In particular, a standard textbook model assumption is that, in the first-best there are affecting no legal or institutional (or of any other kind either) barriers (constraints, distortions) at all. Rather, a first-best typically assumes a single homogeneous (perfectly co-ordinated, internally logical) government agency, with full legal power and institutional capability to secure the most efficient and fair solution. In practical policy applications, however, the definition of a first-best may not be quite that simple.

Key concepts and issues (section 4)

13. The discussion on the key issues and definitions covers: (I) marginal cost-based pricing policies and measures; (II) settings – different perspectives and scopes for policy-making; (III) relevant institutions and organisations; and (IV) legal and institutional barriers to marginal cost pricing.

Marginal cost-based pricing policies and measures

14. The theoretical and empirical economic literature dealing with marginal cost-based pricing policies and measures is vast and well-developed. The literature covers the whole range of issues from abstract underlying theoretical ideas and principles to the details of practical pricing measures and specific marginal cost-based policy packages. An important distinction is *first-best pricing vs. second-best pricing*, corresponding to the fundamental distinction the economic theory makes between first-best and second-best cases.
15. AFFORD Deliverable 1 (Milne, Niskanen and Verhoef, 2000) presented an overall view of these issues, and of conceptual economic and real-world models available for their analysis. The deliverable concluded that serious gaps still exist between the

economic theory and real-world modelling on one hand, and the theory (and modelling) and practical policy-making on the other. These considerations provide the theoretical economic and modelling basis for this study.

16. Practical marginal cost-based pricing measures or instruments available for representing marginal cost pricing in practice currently, and addressed in AFFORD Deliverable 1, include: road or congestion pricing, parking pricing, public transport fares and subsidies, and taxes on car ownership and fuel or vehicle-kilometre based. However, the deliverable emphasised that, in particular in second-best situations, it is appropriate to consider marginal cost based policy packages which use these individual pricing measures in combination, and in combination with other measures related to revenue use, investments, etc.
17. Deliverable 1 presented illustrative examples of such marginal cost-based pricing policy packages. The so-called *weak or acceptable package* assumes relatively low charges and earmarked revenue use. The so-called *strong or best practice second-best package* assumes relatively high charges, while much of the revenues are used to lower labour taxes (with no earmarking).
18. The welfare effects and acceptability of these two – and other similar – packages have been further investigated in parallel AFFORD Deliverables 2a and 2c respectively (Fridstrom et al, 2000; Schade et al, 2000; and Schade and Schlag, 2000). This study (Deliverable 2b) will analyse these packages from the legal and institutional viewpoint.

Settings – different perspectives and scopes for policy-making

19. AFFORD Deliverable 1 distinguished between different *perspectives and scopes for marginal cost pricing related policy-making* in urban transport. The deliverable adopted the notion of *settings* to incorporate the whole range of such perspectives and scopes. More specifically, four settings were introduced, and they were (slightly modified here) the following: (1) focussing on marginal cost pricing within road transport; (2) considering marginal cost pricing for multi-modal transport; (3) focussing on marginal cost pricing in a spatial and geographical context; and (4) covering inter-sectoral aspects of marginal cost pricing. These settings are thought to provide a comprehensive range of actual real-world marginal cost pricing related policy-making situations with varying scope and coverage.
20. This study will consider these settings separately and will identify the whole range of key legal and institutional issues (that may affect the implementation of marginal cost pricing in urban transport) specific to each. As there evidently is much overlap and interaction between the settings, these aspects will be paid particular attention too.

Relevant institutions and organisations

21. The theoretical and applied literature presents a number of abstract *definitions of organisation and/or institution*. However, such definitions have not previously (to our knowledge) been explicitly linked with marginal cost pricing issues in urban transport.
22. The *range of relevant actors*, potentially affecting or being affected by marginal cost pricing, includes all organisations and institutions likely to play a significant role in the designing and implementation of a marginal social cost-based urban transport pricing system in practice. This, for example, means involvement at the different policy-making levels – local, national, EU – and during the different temporal stages of the policy process (the policy formulation stage vs. the implementation stage). The relevant actors include public administrative bodies, and various organisations in the private and the third sector with varying levels of formality.
23. Besides actors, this study distinguishes between two other types of institutions: agreements/contracts external to an actor, and agreements/contracts internal to an actor. The *agreements or contracts external to an actor* govern its external relationships in relation to other actors (also beyond the transport sector). They define the legal and institutional structure or system within which the actors operate. These can be formal agreements/contracts like laws but can also mean informal interdependence between actors, through competition or co-operation in the market, through the political system, etc. They may also cover broader socio-economic systems and structures – the political system, markets, etc. The *agreements or contracts internal to an actor* govern internal functions and structure (actions, forms) of an actor and link individuals involved in (working for) it together. Again, the relevant agreements/contracts can be explicit or implicit, formal or informal, and can differ widely in character from public agreements/contracts like laws to cultural conventions.
1. This study adopts the following terminology: 1. the term *organisation* is used to specifically refer to actors – firms, agencies or any organised groups of individuals – especially when focusing on internal agreements/contracts, i.e. the internal structure; and 2. the term *institution* is used as a general concept which covers both actors/organisations when focusing on external agreements/contracts, i.e. the relationship vis-a-vis other actors – as well as all kinds of legal and institutional agreements/contracts (external and internal) between them.

Legal and institutional barriers to marginal cost pricing

25. From the viewpoint of marginal cost pricing, the legal and institutional agreements/contracts (external and internal) may affect as either enablers or barriers. That is, they can facilitate the implementation of marginal cost-based pricing policies, but also can create distortions to the efficient functioning of the (transport but also more generally) markets or can place limits or constraints on the available and feasible policies.

26. The *legal and institutional barriers to marginal cost pricing* may appear on the charging side and the revenue use side. From the viewpoint of marginal cost-based pricing policy, they can be either given facts of life or removable. Important examples of the former type of barriers are *policy related* barriers: potential conflicts between the marginal cost-based pricing principles and policies on one hand, and the prevailing national (and EU) level policies in the transport sector and beyond and aiming to different and often more general goals on the other. The *removable barriers* are dependent on transport pricing related agreements/contracts, laws, etc., and thus in principle can be influenced and corrected to better conform with the requirements of marginal cost pricing. Evidently which legal and institutional barriers should be taken as given in any particular case partly depends on the scope and perspective of decision-making, i.e. on the setting.
27. The legal and institutional barriers may cause distortions which, corresponding to the four settings, can be classified as being: 1. intra-modal; 2. inter-modal; 3. spatial and geographical; or 4. inter-sectoral. The *intra-modal distortions* relate to the imperfect ability of pricing measures to differentiate between different types of users, and to differentiate between users in time and/or between routes. These issues will be addressed when focusing on marginal cost pricing within road transport (setting 1). The *inter-modal distortions* include issues related to an integrated pricing system and barriers to efficient (possibly earmarked) use of revenues within the transportation sector. These issues are most relevant when considering multi-modal transport (setting 2). The *spatial and geographical distortions* (including land use issues) are critical when focusing on marginal cost pricing in a spatial and geographical context (setting 3). Finally, the *inter-sectoral distortions* become relevant when covering inter-sectoral aspects of marginal cost pricing (setting 4) – such as the relation of marginal cost pricing in (urban) transport to general fiscal taxation, redistribution of revenues across sectors and the associated shadow price of public funds. Therefore, within each setting, potentially different set of legal and institutional barriers may be considered as a contributory cause for the second-best constraints/distortions, and a different range of best practice second-best cases vs. the first-best benchmark can be defined.
28. Another important distinction classifies legal and institutional barriers into: (i) structural barriers; (ii) opposition from interest groups; and (iii) low socio-political acceptability.
29. The *structural barriers* may be caused by: (i) inappropriate or non-optimal organisational structures to facilitate marginal cost-based pricing and associated charging and redistribution mechanisms; (ii) insufficient legislation to support marginal cost-based pricing and associated charging and redistribution mechanisms, including some laws which may even appear to support contradictory objectives and/or to prevent certain measures explicitly; and (iii) prevailing economic and/or transport-related policies at national level which appear to be in contradiction with marginal cost pricing principles, at least in the context of the local urban transport pricing environment.

30. Barriers related to *opposition from interest groups* relate to non-governmental actors and/or organisations with a perceived stake in the urban transport system, who deliberately oppose marginal cost-based policies and measures. Reasons for their opposition might include perceptions of: (i) insufficient communication regarding the objectives and potential benefits (and dangers) of marginal cost-based pricing policies; (ii) distributional issues regarding precisely who wins and who loses; and (iii) insufficient effort and resources to cater for and, perhaps, compensate those who might expect to be worse off as a result of marginal cost-based urban transport pricing policies.
31. A natural (implicit) assumption when considering the legal and institutional barriers to marginal cost pricing is that sufficient political support or socio-political acceptability exists (has been gained) already, and that the problem is to get it to lead to a real action – to the actual implementation. However, in many (most) cases in real life, this precondition is not satisfied: it is the low socio-political acceptability which is the real problem; moreover, this problem appears to be closely interlinked with the legal and institutional status quo.
32. Strong theoretical arguments suggest that non-governmental organisations acting to oppose marginal cost pricing policies are much more common than similar organisations acting for their support. This can be explained by the asymmetry between winners and losers due to marginal cost-based pricing policies: typically, the intensity of welfare changes for the losers is notably bigger than for the winners, suggesting that potential losers create organisations to oppose the policies more likely than potential gainers to support them.
33. One important reason for low socio-political acceptability may be its potential dependence on the legal and institutional status quo. That is, while in many cases changing the legal and institutional structures/systems first might be the key to gaining the required socio-political acceptance, such a change does not appear likely without gaining the required acceptance first. This may partly explain why, in the minds of policy-makers, acceptability issues and institutional issues seem to get easily mixed. This study will pay specific attention to this issue, which the existing studies about socio-political acceptability of marginal cost pricing (or the studies focusing on the legal and institutional barriers) have not explicitly addressed.
34. In summary, the *low socio-political acceptability* is manifested in the behaviour of politicians and government organisations – and typically at the local level. It may reflect: (i) the fact that marginal cost pricing is not universally accepted by economists and other relevant academic disciplines; (ii) the fact that politicians and civil servants representing the relevant organisations are not familiar with or are not convinced by the principles of marginal cost pricing; (iii) tensions between the local and national levels of government; (iv) the need for local governments to justify their policies in terms of practical (pragmatic) and often detailed arguments rather than in terms of general arguments referring to efficiency and equity or fairness benefits which are the criteria emphasised in the context of marginal cost pricing; (v) the competition between different neighbouring local communities; and (vi) the

interests of individuals working within government organisations with a stake in preserving the status quo.

Settings (section 5)

Focussing on marginal cost pricing within road transport

35. When *focussing on marginal cost pricing within road transport* (setting 1), the *key issues* are related to the practical ways of charging road users, and, in particular, with the aim to differentiate between different users according to their types or time of day. The *organisations involved as prime actors* are government agencies responsible for managing the urban road network. At one extreme, this could be a single homogeneous organisation; at the other, it could involve divisions of jurisdiction between local and national government, between neighbouring geographic localities and between different management functions, some of which may even be provided by the private sector.
36. The *relevant legal and institutional barriers* may affect the ability of marginal cost-based road pricing to differentiate between different types of users, and/or between users (similar or dissimilar) in time. Marginal cost-based road pricing, when implemented, must be compatible with the overall legal structure. One important reason why legal and institutional barriers may affect, or even prevent, the implementation of marginal cost road pricing, can be a potential conflict with national level laws and policies. Such laws, affecting the ability to charge marginal cost-based prices may e.g. be constitutional laws guaranteeing freedom of move (road tolls) or privacy (electronic road pricing). The relevant laws and policies may also be related to fiscal taxation.

Considering marginal cost pricing for multi-modal transport

37. When *considering marginal cost pricing for multi-modal transport* (setting 2), the *key issues* are related to (i) pricing within the urban public transport sector; and (ii) the integration of urban public transport pricing with approaches in the road transport sector. A critical issue which arises under both headings is the existence of, or potential for, public transport subsidy. Other important issues are setting consistent user charges across different modes including public transport (integrated multi-modal marginal cost-based pricing schemes), the internal organisation of public transport, and using the revenues optimally (cross-subsidies, earmarked revenue use) within the transport sector. In particular, related to the privatisation and deregulation, there is the theoretical issue of whether marginal cost pricing makes sense for public transport. For example, if it involves operating at a loss, there may be very big legal and institutional implications. Also, this is an area where potential conflicts between national and local policies may be an important issue. The *organisations involved as prime actors* are government agencies responsible for managing the urban multi-modal transport system.

38. The *relevant legal and institutional barriers* may restrict the ability to implement a comprehensive and integrated marginal cost-based pricing scheme. Is such a scheme, covering several modes, feasible – legally, institutionally and politically? Also, the relevant barriers may affect or prevent using earmarked revenues within the transportation sector. A third type of barrier is the influence of national level policies. For instance, if a national government follows a philosophy heavily influenced by the perceived benefits of privatisation and deregulation, it may put in place legal and institutional arrangements for some parts of the urban transport sector (e.g. public transport provision) which make it much more difficult for local government agencies to intervene in the market.

Focussing on marginal cost pricing in a spatial and geographical context

39. When *focussing on marginal cost pricing in a spatial and geographical context* (setting 3), the *key issues* are related to the differentiation between different users of the transport system spatially and geographically, to allowing for longer term land-use effects, and to competition and/or co-ordination between neighbouring localities within the relevant urban region on issues related to economic development and land use. The *organisations involved as prime actors* may comprise a partnership of government agencies responsible for multi-modal transport across the urban region and those responsible for the urban economy and land use planning and development policy. As these are, typically, completely separate functions within the local urban management framework, effective co-ordination for practical decision-making could be difficult to achieve, although it should be by no means impossible where all functions are ultimately accountable to the same elected political representatives.
40. The *relevant legal and institutional barriers* that may limit the ability of marginal cost-based pricing to differentiate across space or geographically are related to ‘distortions in other routes’ and to the ability to differentiate between different types of roads. Especially important barriers may be related to co-operation between communities within a large conurbation, which is primarily an institutional issue (i.e. different geographic areas, road types etc. fall under different organisations).

Covering inter-sectoral aspects of marginal cost pricing

41. When *covering inter-sectoral aspects of marginal cost pricing* (setting 4), the *key issues* (i) impacts on the base of fiscal taxation; (ii) inter-sectoral revenue transfers without hypothecation (e.g. to lower labour taxes); and (iii) the question of whether similar marginal cost-based pricing principles are applied in other related sectors (with potential implications for the efficiency of resource allocation between sectors). A further technical issue is the determination of the shadow price of public funds. The *organisations involved as prime actors* include the ministry of finance. When distributing the revenues through inter-sectoral transfers, the prime actor role moves from local to national level, as only those government agencies with an overview of all sectors of the economy would appropriately take on the role.

42. The *relevant legal and institutional barriers* are related to the ability to use revenues in an efficient (optimal) way. Are there legal and institutional barriers affecting the use of revenues? In particular, are there such barriers to using the revenues to lower distortionary labour taxes?

Co-ordination issues

1. Important reasons for the need for co-ordination of decisions at the different policy-making levels – represented by settings 1-4 – include: (i) the marginal cost pricing measures, typically implemented at the local level, may be in contradiction with (more general) national level policies and laws; (ii) strategic behaviour of key organisations may cause confrontations – in the form of, for example, policy and tax competition between different government levels; and (iii) the marginal cost-based pricing policy packages typically cover both the charging and the revenue use side (e.g. the weak and the strong package above).

Empirical analysis – preliminary considerations (section 6)

44. In order to carry out a comprehensive and sufficiently detailed empirical analysis, this study has undertaken: (I) a review of the prevailing legal and institutional situation in the member states of the European Union and beyond; (II) case study reports of the prevailing legal and institutional frameworks and barriers affecting urban transport pricing for five case study locations (Athens, Edinburgh, Helsinki, Lombardy and Madrid); and (III) a questionnaire and related in-depth discussions involving transport professionals and politicians within the case studies. In addition, the authors have gained access to first-hand information concerning the experiences in The Netherlands.

Review of the prevailing legal and institutional situation

45. The overall goal of the *review of the prevailing legal and institutional situation* has been to identify the frameworks (structures, systems) and barriers relevant to the implementation of marginal cost-based pricing and to provide an overall view of the complexities involved. More specifically, the review: (i) concludes on the degree and importance of inter-country differences of existing legal and institutional frameworks; (ii) distinguishes relevant (i.e. critical to marginal cost pricing) information on the prevailing legal and institutional frameworks from information which is ‘nice to know’ but less relevant; and (iii) presents tentative conclusions providing reference information for the case study analyses but also direct information to the overall findings of the study.
46. Regarding the *degree and importance of the inter-country differences of existing legal and institutional frameworks*, to the analysis and policy conclusions, different views seem to exist. It is sometimes stated that there are such large differences between different countries that the ability to use standard theories and formal models let alone quantitative analysis to draw general conclusions about their impacts on issues such as transport pricing policy is rather constrained. However,

the views emphasising the importance of these differences seem to reflect a lack of sound theoretical approach or framework and a tendency to focus too heavily at a detailed level. Our view is that, at a more general level, the similarities between countries (and, in particular, EU member states) far outweigh the differences.

47. The *relevant information on the prevailing legal and institutional frameworks* can be distinguished from less relevant only based on good understanding of the nature of questions to be asked and the methods and models to be used. For example, while the foundational aspects of the constitutional framework can vary from country to country, from very central-oriented to federal, across EU member states, these divergences should not necessarily prevent the achievement of transferable results, either qualitative or quantitative. Rather, they can act as a driving force within a formal model for generating different results.
48. Distilling *tentative conclusions* is affected by the problem that transport pricing policy issues have not previously been investigated systematically in a legal and institutional context. There is a very limited availability of other relevant work to provide reference information and facilitate the analysis at anything other than a very general level.
49. The review suggests two broad groups of administrative models across the EU: (1) a model of two administrative levels – local and national; and (2) a model of three or more administrative levels – local, national and intermediate (usually regional) levels. The former model tends to be common in smaller countries with fewer than 15 million inhabitants, whereas the latter is most common in larger countries. This is a natural function of human and geographical scale: in some cases the population and/or spatial area of a region within a large country may be similar to that of a smaller nation. The significance of this issue to transport pricing policy is, quite simply, that the number of administrative levels which need to be involved in formulating and implementing policy will affect the logistical complexity of achieving policy goals. It might be reasonable to expect that the greater the number of administrative levels the greater the legal and institutional complexity (and associated barriers) will prove to be.

Case study reports

50. The *case study reports* provide a detailed description of prevailing legal and institutional structures/systems for the five case study environments (Athens, Edinburgh, Helsinki, Lombardy and Madrid). These reports describe the existing transportation systems and transport pricing approaches for the urban areas concerned (focussing on legal and institutional aspects) and consider the potential barriers that legal and institutional frameworks (structures/systems) might present for marginal cost-based urban transport pricing.
51. The case study reports show that the urban areas chosen by the AFFORD study represent a broad sample of situations in the European context. In particular, the following important dimensions emerge: (i) the number of administrative levels

(two for Athens, Edinburgh and Helsinki, three for Lombardy and Madrid); (ii) the balance of responsibility between the public and private sectors (e.g. the market-oriented approach to public transport provision in Edinburgh, compared to much more interventionist policies in Helsinki and Madrid); and (iii) the level of stability of the prevailing legal and institutional frameworks or structures/systems (e.g. the long-standing and stable arrangements in Athens and Helsinki, compared to the evolving legal approaches to transport pricing and the recent and related creation of a new national institution in Edinburgh).

Questionnaire

52. In addition to the case study reports, data collection within the five case studies was carried out by means of a *questionnaire* posed to local politicians and planners, focussing on the legal and institutional issues related to urban transport pricing. This, supported by in-depth discussions, has helped to clarify the perceived implications of issues raised by the background reports and has enabled a greater focus on the potential for change to urban transport pricing policy.
53. The questionnaire was sub-divided into two parts, the first part focussing on a range of individual measures that may be appropriate for a marginal cost pricing approach and the second part on certain pre-determined specific pricing policy packages. In particular, building on the results of AFFORD Deliverable 1, the questionnaire included two marginal cost-based policy packages: a *weak or acceptable package* and a *strong or best practice second-best package*.
54. The questionnaire was pre-tested in Madrid. The pre-test confirmed the validity of the approach but also showed that, in the interviewees' minds, legal and institutional issues are entangled to those of acceptability. In fact, it was clear that the politicians, planners and managers interviewed tend to think of core issues and barriers in terms of socio-political acceptability rather than in terms of legal and institutional feasibility. This cannot be considered too surprising, because most legal and institutional barriers could potentially be removed at national level if sufficient socio-political acceptability exists.
55. The pre-test also showed that politicians and planners find it difficult to conceive comprehensive marginal cost-based packages for urban transport pricing, as a result of the prevailing legal and institutional structures/systems and the problems that attempting to change them seem to imply. Therefore, it was, in general, not possible to attempt to define packages of this nature, customised to the requirements of each case study location. As a result, the focus of the questionnaire tended towards greater emphasis on the uni-modal road transport setting and on the individual marginal cost-based pricing measures than was originally expected.

Relative importance of barriers to different measures

56. In order to get further information on the interviewees' perceptions of the key problems, the questionnaire introduced a system for scoring individual measures.

Each interviewee was given a total of 100 points, which he/she was asked to allocate to a set of pre-defined measures, in the order of relative importance of the barriers associated with the different measures (insignificant was equal to 0). This survey was devised only as a general guide and was not intended to be analysed statistically, because the size of the sample was extremely small and could not be guaranteed to represent all relevant views.

57. This approach was not as successful as wished, due to the lack of participation of interviewees for some of the case studies. Evidently the scoring approach did not fit easily with the perceptions of barriers in some locations and was considered too abstract to be useful. The experience suggests that it may not be an easy task to find a simple comparison mechanism for such a range of different issues, with very different legal and institutional aspects.

Legal and institutional barriers to marginal cost pricing – review of prevailing structures (section 7)

58. This section analyses the legal and institutional frameworks, structures and barriers in more depth, identifying and assessing them further, in the light of the empirical data. Following the conceptual format adopted, these issues are again considered separately within the four settings adopted above.

Focussing on marginal cost pricing within road transport

59. In general, the legal and institutional frameworks and structures required to implement marginal cost-based pricing for road transport in Europe (and beyond) have, so far, not been put in place. Even less has their potential for promoting efficiency been tested. This is particularly the case for urban road travel. Even those countries which have long-standing and accepted legal and institutional provisions for road pricing systems related to inter-urban motorway use may face a new and different set of problems when considering road pricing in the urban context.
60. The primary policy-making responsibility for most urban roads lies at the local or regional level, depending on the relative levels of power and the division of responsibilities between local and regional government. Looking after the transport system is a practical function which operates in parallel (but, often, subordinate) to managing the local and/or regional economy and providing for the general economic, social, environmental, health and educational needs of the resident population. Therefore, the emphasis of transport policy is very much on providing a service which facilitates other important lifestyle activities and all policy has an inevitable competitive angle with respect to neighbouring localities/regions. This has, traditionally, tended to encourage policies promoting maximum mobility in pursuit of short-term economic growth and perceived social welfare. Only quite recently have concerns about the potentially damaging economic and environmental impacts of road traffic growth begun to challenge the predominance of other objectives in the local/regional policy-making context, usually as the result of quite

severe problems affecting the more general local/regional policy goals which are perceived to be unacceptable.

61. The case studies undertaken demonstrate that, in general, the *legal and institutional frameworks and structures* required for the implementation of marginal cost-based road pricing are not yet in place in European urban areas. Marginal cost pricing principles have, to date, played little part in determining the prevailing pricing structures for road transport, particularly for urban areas. As a result, the prevailing legal and institutional frameworks have been established and have evolved, primarily, to cater for other political and economic concerns.
62. One clear example of this is the strong precedent that the primary form of explicit road transport pricing in EU member states is currently an annual licence fee, paid to national government, to permit unlimited access to the road network. This approach is wholly inappropriate if the objective is considered to be promoting efficient use of the road transport system, as it fails to relate the amount paid to usage or to differentiate in time and space to discourage congestion. However, it may be quite an effective approach for meeting the objective of collecting revenue for the national treasury.
63. The key issue regarding *institutional relationships* in urban road transport pricing may be the national-regional-local dimension. At present, the major user payments made in respect to road transport (annual vehicle licensing and fuel duty) are paid to national government agencies. Only fees for local services, such as parking, are generally paid to local agents. Any pricing system which attempts to address the efficiency of urban transport will, inevitably, need to involve local government agencies and to allow for differentiation between individual urban areas and regions. This will require quite significant modification of existing financial relationships, both between different levels of government and between different geographical units within the same government level, probably leading to rather greater complexity. In particular, the geographical boundaries used to divide nations into regions and/or the urban landscape into adjacent local municipalities would have the potential to become rather greater sources of conflict in the road transport sector than they are at present.
64. The introduction of marginal cost-based pricing for urban road transport will require not only the creation of supporting laws and institutions, but also a significant change to the existing governmental culture with regard to road transport. The potential implications that national government may be required to cede both revenue and power to local and regional agents and that the different government levels will need to establish more complex relationships based around common goals may present extremely difficult practical barriers, at least in the short run.

Considering marginal cost pricing for multi-modal transport

65. A clear deficiency in many European urban situations is the lack of strong, well-established dedicated institutions with the powers to oversee and control multi-

modal transport pricing across urban regions. The tendency towards much of the decision-making power resting with geographically limited local government agents in some cities results in a much more complex legal and institutional structures than are desirable or efficient when attempting to achieve coherent multi-modal transport policy across the full urban area and its sphere of influence.

66. In addition to the issue of the need for relationships between institutions at different levels (as raised above, for urban road transport), the key issue in the multi-modal context may be the sheer volume of institutions which would need to be involved, including all government agents responsible for any aspect of transport provision and pricing within the urban region, plus the full range of public transport operators. In the case where private public transport operators exist, there may even be several competing operators within any given mode. Therefore, in some situations, a prerequisite for introducing a comprehensive multi-modal transport pricing system across an urban region may be a degree of legislative and institutional modification to simplify the arrangement in the existing situation.
67. The discussions above imply a number of barriers which may hinder progress towards any multi-modal urban transport pricing policy. However, as for road transport, the key barrier when focussing on marginal cost-based pricing may be the need to change existing transport pricing culture.

Focussing on marginal cost pricing in a spatial and geographical context

68. Any analysis of marginal cost-based pricing which focuses solely on the transport sector (in the single- or multi-modal context) will, implicitly, tend to focus on short-run pricing issues related to prevailing travel patterns. However, transport is essentially a 'derived demand', which depends upon the spatial and temporal arrangement of lifestyle activities. If pricing within the transport sector is inefficient (as we expect it to be in urban areas at present), then the arrangement of the associated activities may also be inefficient as a direct consequence. For example, if private car users currently pay significantly less than the marginal social costs of their journeys, we might expect that the spatial diversity of their activity profiles would be greater than under efficient pricing (leading to more travelling), while the temporal diversity would be less (as a result of a greater tendency to travel during peak periods).
69. Although economic theory suggests that the application of short-run marginal costs within the transport sector will encourage greater spatial and temporal efficiency, this will tend to require both travellers and activity providers to modify long-run decisions, such as location of residence, location of employment and activity provision / involvement, temporal constraints on employment and activity provision / involvement, etc. Therefore, moving to a setting which includes spatial issues will necessitate a broader and more complex approach. In practice, it seems self-evident that resolving long-run issues related to the spatial and temporal arrangement of activities provides the key for achieving more efficient and sustainable urban

environments. However, from an urban transport policy-making perspective, it is also likely to make the problem appear much more demanding.

70. A precedent already exists in some European urban areas for spatial and temporal access permits, but these are primarily restricted to downtown areas and, currently, tend to be based on regulation rather than pricing. However, plans to permit permits based on pricing appear to exist in a number of states. Parking charges are organised in a similar fashion in most European urban areas, but only the WPL proposals in the U.K. currently appear to have the potential to extend parking fees to the broader spatial context. Other measures which are aimed more directly at land uses are much less common and tend to be considered largely outside the scope of transport policy-making. However, as land use planning is quite commonly the responsibility of local government agencies, the potential for greater integration of land use policy-making with local transport pricing initiatives clearly exists.
71. The key *institutional relationships* in the spatial and geographical context may reasonably be expected to include relationships between those government agencies responsible for transport and land use policy-making. In some cases, this may actually involve relationships within the same formal government institution and relate primarily to the lack of integration in the treatment of transport efficiency and economic prosperity goals. Other important relationships will involve policy-making at different government levels (i.e. greater integration of land use and transport policy-making may need to be considered at national and European level if it is to be implemented locally) and the relationships between government agencies and private developers and land use operators.
72. A major difficulty for considering marginal cost-based pricing in the spatial and geographical context is the need to implement charges over a wide geographical area, rather than limited to a compact city centre. In particular, the need to involve geographically distinct local government agencies within a single charging system would, inevitably, lead to practical and political complexity. As for the multi-modal setting, the lack of a single, independent transport authority responsible for pricing issues across the urban region is a drawback in most urban situations. However, even where such an authority might exist, a restriction of its powers to the transport sector may still hinder the ability to address spatial issues.
73. While many urban policy-makers are starting to show general interest in promoting new measures such as tele-working, such initiatives are often not considered to be a direct element of transport policy and the existence of some ambiguity regarding precisely which policy area they form part of can tend to retard progress in implementation. A major issue is the fact that securing funds may involve transfer of revenues both between policy areas (e.g. from road transport) and across geographical boundaries (i.e. between neighbouring local government areas).

Covering inter-sectoral aspects of marginal cost pricing

74. General taxation policy is generally found to be predominantly the responsibility of national government and national transport taxation (e.g. fuel taxes and road vehicle licenses) has traditionally been based on general fiscal principles, raising money for the national treasury. However, local (and, in some cases, regional) institutions do have some limited taxation powers (e.g. levying local property-based taxes and parking charges, sometimes varying the levels of national taxes to a limited extent).
75. The key *institutional relationships* are those between different levels of government. National governments naturally wish to retain control over taxation policies and ensure that they receive the majority of total revenues, while local government agencies wish to ensure that the benefits resulting from taxes paid locally are perceived within the area. As a result, inter-sectoral revenue transfers are always likely to prove politically contentious. This needs to be addressed as part of second-best analysis.
76. Existing taxation regimes which traditionally raise revenue for national government are unlikely to be altered in the short-run. However, as transport problems have moved up the political agenda, there seems to be a greater willingness in government to alter the basis on which transport related taxes are decided, provided that: 1. existing revenue streams are not significantly adversely affected; and 2. the new taxation approach is not perceived to be politically unacceptable.
77. Distortions in other economic sectors are inevitable and influencing them is likely to be beyond the scope of even the broadest consideration of transport pricing policy at present. Therefore, any attempt at significant changes in urban transport pricing will need to consider carefully the nature and scale of these distortions as part of the second-best situation. In particular, it may be most important to focus on distortions which may be expected to impact on the welfare of lower socio-economic groups and result in social exclusion.

Synthesis

78. Overall, it is probably true to suggest that the progression through the four settings, towards a broader analysis, results in greater potential for complexity and barriers that seem difficult to overcome. The one respect in which this may not hold is the shift in focus from short-run to long-run issues, which takes place in parallel. In this case, a focus on the long-run may actually imply rather simpler levels of differentiation (albeit in broader application) and, therefore, rather less reliance on introducing electronic charging technologies.
79. While it is apparent that urban transport policy innovations are being considered in a number of European states towards the ability to levy more direct charges for road use, much less is being done towards new pricing regimes in the multi-modal, spatial and geographical, and inter-sectoral settings. However, even where policy innovations are being considered and transport demand management goals represent a significant motivation, it is clear that the practical solutions envisaged are some way removed from marginal cost pricing principles.

80. An extremely important issue which helps to explain this is that, in general, real-world policy-makers remain unconvinced that marginal cost-based pricing approaches are both feasible and desirable in practice. In particular, policy-makers come from a wide range of core discipline backgrounds, many of which advocate significantly different perspectives to those put forward by welfare economics. Thus, as the traditional practical pricing and decision-making culture in transport (and many other sectors) is not immediately consistent with marginal cost pricing approaches, there is an undeniable tendency for policy-makers to dismiss arguments of theoretical efficiency as an academic irrelevance.

Legal and institutional barriers to specific marginal cost-based policy packages (section 8)

81. Besides individual pricing measures, the case studies analysed legal and institutional issues (frameworks, barriers) from the viewpoint of marginal cost-based policy packages. More specifically, two policy packages, the so-called weak and strong package, originally defined in AFFORD Deliverable 1 were assessed. The former package assumes relatively low charges and earmarked revenue use. The latter was labelled in Deliverable 1 as the best practice second-best package. It assumes relatively high charges and that much of the revenues are not earmarked but are used to lower labour taxes. The weak package is, thus, especially relevant in a spatial and geographical context (setting 3); the strong package when covering inter-sectoral aspects (setting 4).

Weak or acceptable package – low charges with earmarked revenue use

82. The *weak or acceptable package* assumes relatively low charges and earmarked revenue use. The package assumes that: *parking charges are increased by 0.25 euro/hour, with a fixed tariff of 1 euro plus taxes on fuel increased by 0.1 euro/litre, while the revenues are allocated as follows: 1/3 to increase road capacity and/or increase parking space, 1/3 to reduce car taxes, and 1/3 to reduce public transport tariffs and/or provide more facilities to cyclists and pedestrians.*

Strong or best practice second-best package – high charges with revenue used to lower labour taxes

83. The *strong or best practice second-best package* assumes relatively high charges and that much of the revenues are used to lower labour taxes (i.e. without hypothecation to specific uses). The package assumes that: *parking charges are increased by 0.5 euro/hour, taxes on fuel are increased by 0.5 euro/litre and a cordon toll of 2 euro in peak hour (7:00 to 9:00 a.m.) and 0,5 euro/hour out of this period, whereas the revenues are allocated as follows: 1/3 to increase road capacity and 2/3 to reduce labour taxes.*

Summary & conclusions

84. It was, in general, expected that the barriers to the strong package would be perceived to be rather greater than to the weak one. This proved to be so in the case studies. In particular, the redistribution element of the strong package met with both legislative barriers and considerable hostility from the representatives of key institutions, as a result of the suggestion that urban transport pricing revenues should be used to lower national labour taxes.
85. The overall implication of this may be that a combination of (public and political) acceptability and institutional barriers will, in most situations, dictate that a significant majority of revenues levied at the local or regional level may also need to be redistributed at that level, for the perceived benefit of the population which pays, regardless of whether or not the funds are used for transport.
86. In addition, it is clear that the principle of hypothecation is quite politically sensitive. In some environments, it is viewed as an important mechanism to improve the acceptability of taxation, while elsewhere it is explicitly forbidden. Such strong attitudes are unlikely to be reversed (or, indeed, unified across Europe) for urban transport pricing objectives alone.
87. Viewed broadly, the key issue from an acceptability viewpoint may be the difference between a package of pricing-based policy-measures which present drivers with a cost trade-off between different travel options (e.g. between paying a particular unit of fuel tax wherever they go, or paying a higher road pricing charge only when they enter the most congested areas of the city) and a package which appears to make all aspects of road use more expensive at the same time. Of course, such issues are most critical at the point of implementation and it may be possible to achieve the full range of proposed measures over time, as part of a phased approach.
88. In conclusion, the two packages considered in this study have served their purpose in pointing to a number of important legal and institutional issues that were not apparent from considering individual marginal cost-based pricing measures separately. However, taken at face value, neither has been shown to be widely successful from a legal and institutional viewpoint.

Needs and prospects for institutional reform (section 9)

The needs for institutional reform

89. The conceptual and empirical analyses of this study have been driven by the goal of identifying the most important legal and institutional barriers to marginal cost-based pricing in urban transport. An important question following this concerns the requirements for institutional reform with respect to these barriers.
90. Regarding *organisational structures*, it is clear that the existing arrangements for urban transport may be far more complex and disaggregate than would be desirable for implementing a comprehensive multi-modal transport pricing system across an urban region, in many European situations. In particular, it is common for urban

transport to fall within the responsibility brief of local government agencies, implying that any coherent transport policy for the full urban region will require a consensus to be agreed among representatives of a number of geographically separate units who are accountable to different electorates.

91. Also, there is a strong precedent towards arrangements under which the traditional approaches for managing different travel modes have largely been separate. So, typically, the institutions responsible for providing and operating public transport services play little, or no, role in private road transport (and vice versa) and their pricing policy objectives may be unrelated. Therefore, the process of putting together a consortium of institutions that would need to co-operate for a successful, comprehensive multi-modal urban transport pricing system to be introduced might result in such a large group with such disparate interests that the prospect of effective implementation would be greatly reduced. At present, the impact of this is best gauged by proposals to introduce road pricing schemes, which have, in general, attempted to side-step institutional complexity by constraining the areas affected to very compact city centres. The corollary is that the resulting road pricing systems may be expected to have only a very small impact on city-wide travelling.
92. A separate dimension, related to organisational structures, is that of different levels of government. Here, the precedent is quite clearly for detailed urban transport issues and implementations to be dealt with at the local and/or regional level, while inter-urban transport and general strategic transport policy-making is normally the responsibility of national government. It is also important to acknowledge the difference between capital and provincial cities, because the former tend to receive more involvement at the detailed urban level from national government.
93. From a transport pricing viewpoint, the key barriers relate to: (a) the politics of the general financial relationships between different government levels (which may involve complex arguments and power struggles overriding issues of ideology); and (b) the prevailing precedent for pricing road transport (which typically involves annual licensing of vehicles and duty on the purchase of fuel, both of which provide significant unhypothecated revenues to general national funds). Any major change in existing revenue streams and money flows between government levels would, almost inevitably, result in conflicts based on the perceived changes in the balance of power they implied. In addition, national governments might be expected to oppose vigorously any significant reductions in revenues from existing transport taxation, or any attempts to constrain how it might be spent and/or redistributed, on both political and budgetary grounds.
94. With regard to prevailing *legislation*, there may be two key strands: (a) laws governing the structures of institutions and the relationships between them (relating to the organisational issues discussed above); and (b) laws required to support specific marginal cost-based pricing measures which are not currently operational (in an appropriate form to encourage efficiency). For example, laws which provide for the competitive operation of privately owned urban public transport services will have an important impact for both the potential number (and nature) of institutions

that would need to be included within a multi-modal transport pricing system and for the degree of control that government agencies can exert over user fares. Also, marginal cost-based pricing for road use might, ideally, require levels of differentiation between users that could only feasibly be applied by advanced electronic charging technology, which would, in turn, need supporting legislation to regulate use and safeguard both the rights of users and the credibility of the system. Indeed, in some instances prevailing legislation relating to civil liberties may hinder the enforcement of electronic systems, by restricting the power to collect and use electronic data.

95. At a more general level, it is, perhaps, worth making the point that, although there is no shortage of examples of current national legislation to state that user prices for certain elements of urban transport should be based on competitive commercial principles (e.g. U.K. bus fares) or on a non-profit cost coverage approach (e.g. publicly operated parking in Madrid), the authors are aware of no current examples of national legislation to state that any element of urban transport pricing should be based explicitly on marginal cost approaches!
96. In the light of these observations, it can come as no surprise that prevailing *national policies* – economic and/or transport-related – in the EU are, typically, contradictory to marginal cost pricing principles for urban transport. In most cases, the main policies towards public transport pricing appear to be motivated by the desires to cover service costs and encourage usage, while those towards pricing road transport appear to be motivated, separately, by the desire to raise revenues. In the case of urban public transport, the focus tends to be on providing an efficient service to support the economic health of the city and on addressing equity concerns for the poorer and less mobile members of society. In the case of private road transport, there is, typically, a balance between competing objectives of reducing the perceived congestion and environmental impacts of traffic growth, while accommodating existing mobility levels (to avoid negative impacts for the urban economy).
97. However, in recent years, policies which attempt to develop integrated approaches to urban transport have become more popular and tend to view increasing the cost of road use as a mechanism both for restraining growth in road use and acquiring resources for improving the public transport alternatives (i.e. a carrot and stick approach). While not wholly inconsistent with efficiency principles, there are, nevertheless, respects in which these policy-making approaches are, in practice, contradictory to marginal cost-based pricing. In particular: (a) any resulting user pricing would probably be decided more on the basis of politically acceptable unit charges which would provide revenue streams sufficient to fund particular projects, not on calculations of external costs; and (b) revenues generated within the urban transport sector are most likely to be redistributed there, providing alternatives to road travel but attempting to support (and, perhaps, even increase) current mobility levels.
98. Thus, in those situations where innovate approaches for pricing road use, such as road pricing, are being considered, policy-makers tend to favour very simple

charging systems with very limited differentiation and hypothecation of revenues to significant urban transport investment packages, including new road infrastructure, new public transport modes, improved infrastructure for existing public transport services etc.

99. Regarding issues of *communication*, the key problem may be that the theoretical basis for marginal cost pricing involves some rather complex economic concepts that are neither common within public understanding of urban transport issues nor, necessarily, shared and valued by all other relevant academic disciplines. Therefore, perceptions of marginal cost pricing are affected by a lack of knowledge and/or consensus within the majority of (government and interest group-based) institutions at all levels, throughout the EU.
100. In the academic and conceptual policy-making community, the basic principles of welfare economics are generally embraced (either explicitly or implicitly), but there is rather less agreement on the specific issues relating to the role of marginal cost pricing approaches in practical policy-making. In particular, while most people appear to accept the validity of first-best pricing as a useful theoretical benchmark for textbook illustrations of transport efficiency, there are still widely varying opinions of how this very simple theory is affected by the collapse of many of its supporting assumptions in the (second-best) real world.
101. From the AFFORD case studies, it is absolutely clear that the majority of policy-makers involved in urban transport pricing at all levels are not, primarily, motivated by a commitment to marginal cost-based approaches and are, in many cases, sceptical of the applicability of the detailed economic theory to the real world urban environments. In some cases, this scepticism may be attributed directly to issues raised within the academic community, in others it may be based more on the lack of clear compatibility between theoretical academic concepts and pragmatic policy-making concerns (e.g. addressing issues of social equity and acceptability).

Prospects for and mechanisms of institutional reform

102. Institutional reform to remove structural barriers to marginal cost-based pricing for urban transport may involve: (i) consideration of legislation at national level which makes explicit reference to the potential benefits of efficient transport pricing, to influence the underlying themes of strategic policy-making; (ii) creation of new institutions and organisational structures designed to facilitate coherent, integrated transport policies and pricing covering whole urban regions; (iii) introduction of new legislation to facilitate the implementation of key marginal cost-based pricing measures and supporting technologies; and (iv) investigation of the political and financial relationships between transport policy-making institutions at different levels of government, towards removing tensions and inconsistencies (especially between national and local level) that may hinder achievement of the most efficient solutions.

103. Institutional reform to remove opposition from interest groups may involve: (i) improving the effectiveness and of communications between the key interest group areas (academic, practical policy-making and public) regarding the potential benefits and dangers of introducing marginal cost pricing approaches; (ii) conducting further research to provide more detailed and reliable analyses of the impacts of practical marginal cost-based urban transport pricing systems, focussing, in particular, on the short run impacts and equity issues that are of such concern to many interest groups; and (iii) using the outputs from (ii) as inputs to further research addressing issues relating to how revenues generated should best be redistributed in practice and working subsequently with real-world policy-makers to devise practical approaches to compensation that will bet meet interest group concerns.
104. Institutional reform to improve low socio-political acceptability may involve: (i) improving the transparency of communication on urban transport pricing issues, particularly in the public domain; (ii) involving representatives from a wide range of institutions (including government and interest groups) in open public debate about transport policy in the urban context, to ensure that all views are properly represented and addressed, including (where appropriate) tensions between institutions, towards a consensus in which all major players have a stake; and (iii) perhaps most important of all, ensuring that the barriers raised in section 9.2.1 and 9.2.2 are addressed and the potential solutions are input to the overall consensus building process.
105. The issue of transparency of communication is particularly important, as part of developing a wider understanding of the prevailing transport pricing problems and the potential benefits of marginal cost-based solutions. At present, the wide-spread lack of this transparency can often lead to policy-makers attempting to justify marginal cost-based measures, such as road pricing, in rather inaccurate and even spurious terms. Just as Project AFFORD has attempted to bring together the differing viewpoints of the various relevant disciplines within the academic community, so the subsequent challenge for both academics and policy-makers is to bring together the very different theoretical and pragmatic viewpoints within the public socio-political environment.
1. An extremely important question is whether it is possible to develop, based on the theoretical and empirical considerations of the previous sections, some theoretically sound and realistic views on precisely what policy-makers should be aspiring to. That is, whether it is possible to provide suggestions regarding optimal and feasible *legal and institutional structures* for the implementation of marginal cost pricing – called here simply *institutional implementation models*.
107. Institutional implementation models should consider or include the relevant patterns for institutional reforms in relation to the structural, interest group and low socio-political acceptability related barriers, as outlined above in sections 9.2-9.4.

108. In addition, the institutional implementation models should specify transition paths or migration routes from the current status quo in urban transport pricing towards the best practice second-best situations. The concept of the implementation models or transition paths should cover the following two aspects (which of course are highly interlinked): (i) the legal and institutional preconditions (barriers, reforms, processes) for the implementation of marginal cost-based pricing; and (ii) a detailed description of the content or substance of marginal cost-based pricing (individual measures, policy packages).
109. Evidently, providing sound policy conclusions regarding the optimal and feasible transition paths and institutional implementation models requires information on (or, at least, rough estimates of) the time profiles of potential welfare effects of alternative scenarios in the short and the long run. Such welfare estimates should provide information on the comparisons between the current situation, the best practice second-best, and the first-best benchmark. Detailed analysis of these issues has been beyond the scope of this AFFORD study.
110. An extremely important question is whether it is possible to develop, based on the theoretical and empirical considerations of the previous sections, some theoretically sound and realistic views on where policy-makers should be aspiring to. That is, whether it is possible to provide suggestions regarding optimal and feasible *legal and institutional scenarios* for the implementation of marginal cost pricing – called here *institutional implementation models*.

Concluding comments (section 10)

111. A major driving force behind any attempt to introduce marginal cost-based pricing should be the welfare benefits that might be available through it. So far, economists and modellers have typically been carrying out analyses focussing on the overall optimal final solution and showing welfare benefits from moving there. Not much is said about the welfare effects related to the intermediate stages of the transition path or institutional implementation model for getting there, in terms of the potential actions for institutional reforms and introduction of specified practical pricing measures and broader policy packages. This reflects the fact that, typically, the existing models do not have the capability of distinguishing between such scenarios.
112. Detailed analysis of the welfare effects related to alternative legal and institutional scenarios or institutional implementation models has been beyond the scope of this AFFORD study too (also the analysis in AFFORD Deliverable 2a were very tentative in this respect). These issues will be investigated in detail (covering all modes and urban and interurban situations) in a forthcoming EU project MC-ICAM.

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Annexes

1 Introduction

A sound consideration of legal and institutional issues is likely to be critical to the successful introduction of marginal cost pricing for urban transport. Typically, economic theory relies on a wide range of simplifying assumptions about real-world conditions to establish a series of guiding principles. Therefore, movement from the general case described in the theory towards actual implementation requires a thorough investigation of detailed organisational issues to ensure that expected benefits are not undermined by unexpected barriers.

In addition, at all but the highest political levels, real-world transport policy-making tends to take place under the assumption that prevailing legal and institutional structures are fixed. Therefore, an important contribution of research related to innovative policy measures is to specify any such organisational features which may hinder progress and to motivate the will of politicians and professionals at the appropriate levels towards overcoming them. This is particularly important in the area of urban transport pricing, because much of the organisational decision-making would need to take place at the regional or local level, where policy-makers may consider that broader legal and institutional issues fall beyond their professional remit.

1.1 Background

This study is part of the EC DGVII AFFORD project. Project AFFORD (Aceptability of Fiscal and Financial Measures and Organisational Requirements for Demand Management) investigates issues relating to the potential for implementing marginal cost pricing for urban transport within the European Union. In particular, it considers the paradox that, while there is a strong body of opinion in economic theory that marginal cost pricing approaches would yield significant efficiency benefits, there has, to date, been little enthusiasm from real-world policy-makers for implementing them in practice.

The research brief of Project AFFORD covers a wide range of issues, including:

- # operationalisation of marginal cost pricing principals from general theory to more complex real-world representation, through the integration of conceptual economic and applied modelling approaches;
- # estimation of efficiency benefits and equity effects, with reference to a number of real-world modelling case studies;
- # investigation of legal and institutional issues, which may present organisational barriers to successful implementation, through interviews with real-world policy-makers in a selection of case cities;
- # investigation of public, business and political acceptability and acceptance issues, which may present social and political barriers to successful implementation, through questionnaire-based surveys in a selection of case cities; and

- # assessment of policy implications for urban transport pricing, through review and synthesis of the research findings.

Operationalisation has been covered by Deliverable 1 of Project AFFORD. Estimation of the efficiency and equity benefits is addressed in Deliverable 2a. The work on public, business and political acceptability and acceptance is reported in Deliverable 2c. This report (Deliverable 2b) focuses on legal and institutional issues. An overall summary of the project findings and their implications for urban transport pricing policy will be contained in Deliverable 3.

1.2 Goals of the study

A key characteristic of Project AFFORD has been the integration of a range of different approaches and disciplines with diverse perspectives on the urban transport pricing problem. Nowhere in the project has this challenge of integration been greater than when addressing legal and institutional issues.

Welfare economics provides the fundamental motivation for marginal cost pricing as efficient pricing, but includes only a general treatment of institutional issues critical to real-world policy-making. Applied empirical models of urban transport can produce useful representations of specific real-world policy scenarios, but tend to treat organisational structures as exogenous inputs. Psychology-based acceptability studies can explore levels of public, business and political support for policies requiring institutional changes, but the relationship between attitudes and prevailing legal and institutional structures may be difficult to discern, particularly amongst policy-makers. It is clear that, to date, research in this area has been insufficient, at both the conceptual/theoretical and applied/practical levels.

This study has carried out a detailed analysis of the implementation of marginal cost pricing from a legal and institutional perspective. The objectives have been:

- (A) to identify and analyse the key features and critical aspects of the legal and institutional issues in relation to marginal cost pricing and to define the range and scope of these issues;
- (B) to develop a sound theoretical approach and framework for analysing the legal and institutional issues;
- (C) to assess the prevailing legal and institutional barriers affecting marginal cost pricing in urban transport in the European Union and beyond; and
- (D) to investigate the needs and prospects for institutional reform to encourage the implementation of marginal cost pricing in urban transport.

To achieve these goals, this study has adopted a broad approach, combining economic principles with non-economic perspectives and combining theoretical analysis with empirical approaches. In particular, case studies related to Athens, Edinburgh, Helsinki, Lombardy and Madrid have been considered. (In addition, information has been provided regarding the situation in Randstad in The Netherlands.) In these cities and urban areas, a questionnaire addressing the prevailing barriers/constraints to marginal

cost pricing and the needs and prospects for institutional reforms (goals C and D) has been presented to transport policy professionals and politicians.

Considering the different types of barriers that may potentially affect the implementation of marginal cost pricing, an obvious rough classification is the following:

1. legal and institutional barriers
2. acceptability related barriers; and
3. technological barriers.

This study will focus on the legal and institutional barriers. However, as acceptability related barriers are closely related, they cannot be wholly ignored. These barriers refer to the impacts that alternative legal and institutional structures/systems may have on public, business and political perceptions, and vice versa. In particular, even though acceptability problems are not considered here as a primary reason or barrier (in a situation where the necessary laws and institutions already would exist), in the longer run the lack of acceptability can be an indirect reason for the necessary laws and/or institutions not existing, i.e. for marginal cost pricing not being legally and institutionally feasible.

Technological barriers mean the limitations that the current technologies impose on the possibility of charging marginal cost based prices in practice. Typical issues are the ability to differentiate between different types of transport infrastructure users and the ability to charge them time-varying charges. These issues are not considered in this study.

A straightforward approach to legal and institutional issues related to marginal cost pricing would be to assume that the relevant institutions/organisations already exist and to focus primarily on the policies that they apply (or object), i.e. in this case marginal cost pricing. However, this would not be sufficient. The impact of new policies and policy innovations on legal and institutional structures/systems, and the continuous interaction between these two, is an aspect that cannot be ignored. In particular, this interaction affects legal and institutional barriers, the main topic of this study.

1.3 Structure of the report

The conceptual or theoretical part of the study aiming at goals A and B (as defined in section 1.2 above) provides a good understanding of previous relevant work; identifies the key issues and definitions; and develops a transparent theoretical approach for analysis.

Section 2 selectively reviews previous work relevant to the study, and section 3 presents the theoretical approach and framework, focusing on the economic aspects of the problem but also integrating broader non-economic aspects. Section 4 in more detail outlines the key issues and definitions. Section 5 discusses settings – a central concept in the study.

The latter part of the document, while covering goals C and D (cf. section 2.1), will report the empirical work. The empirical work will focus on the case cities. Section 6 describes the nature of the empirical approach and background reports (a review, case city reports), and provides some preliminary considerations on the importance of legal and institutional barriers/constraints in relation to specific marginal cost-based pricing measures. Section 7 reviews prevailing legal and institutional structures/systems relevant to marginal cost pricing and identifies the most important barriers, in the case cities and beyond. Section 8 takes the analysis further, by considering barriers to specific marginal cost based policy packages. Section 9 draws conclusions concerning the important issue of institutional reform. Section 10 offers some concluding remarks.

Figure 1 illustrates the structure of the report.

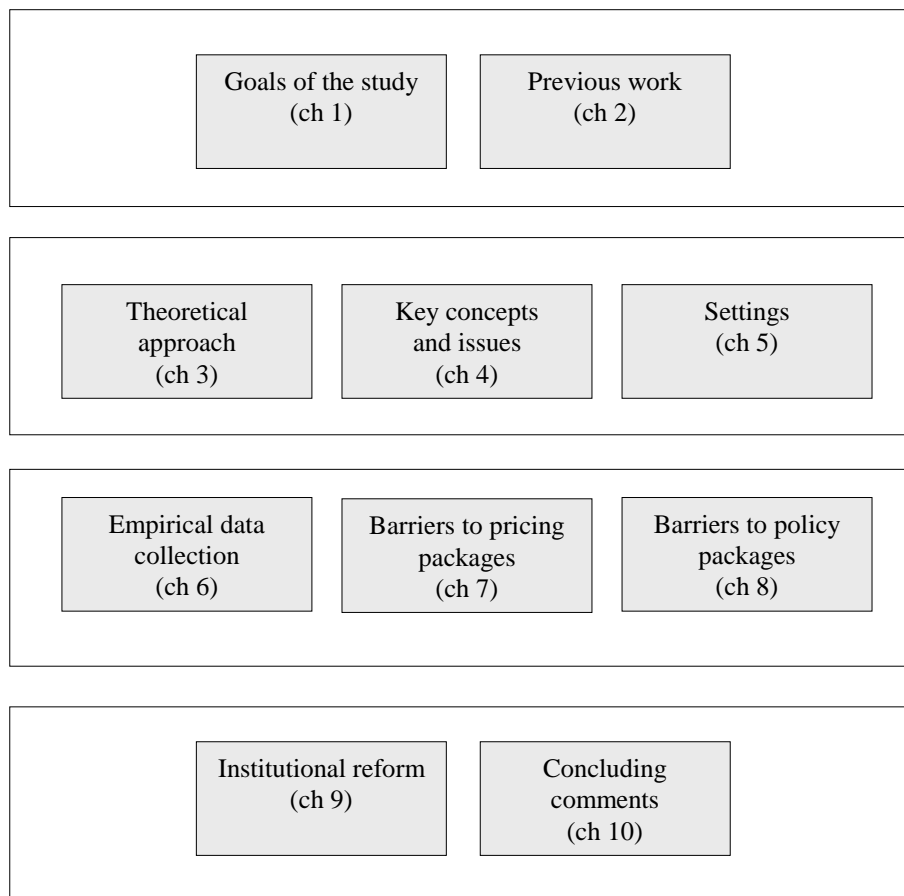


Figure 1. Structure of the report.

2 Previous work

4. Much previous work – including a number of EU research projects – have investigated legal and institutional issues in relation to a range of transport pricing measures. This work has addressed these issues at varying levels of detail, but has not explicitly addressed them in the context of marginal cost pricing. The literature mostly consists of largely pragmatic accounts of detailed legal and institutional issues related to specific policy measures, undertaken as part of real-world feasibility studies and demonstration projects.

5. The literature dealing with the interaction between the legal and institutional issues and marginal cost pricing (principles) is vague and scattered. No other studies (to our knowledge) have specifically devoted to these issues in a marginal cost pricing context either. Perhaps closest to this come a few studies on the experiences in The Netherlands related to the attempts to introduce marginal cost pricing in the Randstad area.

An important question is what the existing more general literature can contribute towards understanding the legal and institutional issues specifically related to marginal cost pricing. This section will address this question by reviewing the approaches and the main results of the existing studies.

Section 2.1 reviews EU projects, section 2.2 reviews other studies.

2.1 EU projects

A number of EU research projects have investigated legal and institutional issues, at varying levels of detail and in relation to a range of transport policy measures. Such projects include PRIMA, PATS, TENASSIS, ICARO, TRANSPRICE, OPTIMA and CAPRI.

Clearly the most interesting project from the point of view of our study is PRIMA. Project PRIMA (www.certu.fr/interang/aintern.htm) produces policy recommendations and guidance for the implementation of road pricing systems in Europe (Pricing Measures Acceptance). The project concentrates exclusively on road pricing schemes in urban areas, and has not considered other pricing instruments such as fuel taxes and parking charges. The emphasis is on practical concerns, and the analysis is conducted in terms of case studies of eight European cities.

The project aims to identify legal and institutional barriers to the implementation of road pricing schemes, and to develop guidelines for removing the barriers. The project involves an assessment of the acceptance of road pricing in urban areas, including the attitudes of relevant actors and the interaction between the decision making process and acceptability.

The project provides a descriptive account of various complications affecting the design of optimal road pricing schemes. Special attention is paid to acceptability problems and the implications of conflicting interests among the population regarding road pricing. Such conflicts arise, for example, due to the existence of groups of gainers and losers from road pricing, and relating to the alternative ways of using the revenues raised.

The project outlines transport-related decision-making processes in the case cities. The involvement of several authorities and general consultations (including the public) are found to be key elements in the decision-making process and transparency and stable political support are found to be vital for the successful implementation of road pricing. Accordingly, the role of information and the media, and the effective communication between the actors at all stages of the process, are strongly emphasised.

The project concludes that public attitudes towards road pricing are in general negative: no form of urban road pricing scheme finds even a 30 % acceptance. This is seen as a potential barrier to implementation. However, it is found that there is considerable support for road pricing if it is used as a way to finance transport investments.

The project notes that road pricing in the case cities is currently either not legally possible or possible only if used as a financing tool. It concludes that an indisputable legal base determining the objectives of road pricing is necessary. Also, while local authorities should have freedom regarding the actual design of the system, strong commitment and backing from upper levels of government is necessary. All levels of government should contribute to the process in areas of their own expertise, but the decision-making process should be kept as simple as possible. The aim of linking the urban and interurban toll systems, and ensuring interoperability at the urban-interurban interface is considered important.

Project PATS (<http://www.tis.pt/proj/pats/pats.html>) focuses on acceptability of transport pricing (Pricing Acceptability in the Transport Sector). The project also considers the links between acceptability and institutional issues (the allocation of responsibilities in implementing and administering transport pricing, the regulatory framework for transport pricing). The project covers urban transport, and all modes of interurban transport. It considers a wide variety of policy packages including a number of pricing instruments.

The project investigates means to increase acceptability and aims at designing acceptable policy packages for transport pricing, while allowing the criteria of efficiency and fairness. A further aim is to identify legal and political barriers to the implementation of pricing schemes. The project concludes that the acceptability of transport pricing may be more dependent on practical institutional issues than on its economic foundation.

Project TENASSESS (<http://www.cordis.lu/transport/src/tenasse.htm>) considers the methodology of policy assessment, with particular attention to the European Common Transport Policy (Policy Assessment of Trans-European Networks and Common

Transport Policy). The strategic study operates primarily at an abstract level, and has not addressed specific policy areas such as urban transport pricing.

The study develops a detailed barrier model, the structure of which includes a very useful set of dimensions for disaggregating the policy-making process into its constituent parts. The *stage dimension* addresses issues related to the temporal development of a policy, from conceptualisation and planning, through decision-making, to implementation and operation. The *arena dimension* addresses regulatory and political frameworks under the sub-headings of administration, legislation and regulation, official politics and informal politics. The *field dimension* covers performance issues, including financing, technical requirements, environmental assessment, regional responsibilities and socio-economic assessment.

Project ICARO (<http://www.boku.ac.at/verkehr/page1.htm>) investigates the potential benefits of increasing car occupancy through high occupancy vehicle (HOV) lanes and car sharing schemes, related to a number of urban pilot studies / case cities (Increase of Car Occupancy). The research includes a detailed analysis of legal, institutional and cultural issues, although there is no specific consideration of urban transport pricing.

The methodology adopted is based primarily on factual statements of prevailing legal and institutional frameworks and subjective assessment of the political and cultural elements from a pragmatic policy-making viewpoint. It includes a concise but detailed checklist, to be completed by policy-makers in the case cities, and a series of more open interviews with selected interest groups (decision-makers, elected officials, transport professionals, transport users and the media) to provide additional information on cultural aspects. The resulting analysis is primarily descriptive.

Project TRANSPRICE (<http://gridlock.york.ac.uk/transprice/>) investigates the potential of practical transport pricing measures for achieving more efficient mode choice decisions in urban areas (Trans Modal Integrated Urban Transport Pricing for Optimum Modal Split). The study is based around demonstration projects in eight case cities. Legal and institutional issues form only a very small component of the research – this means a very brief consideration of legal and institutional provisions for integrated urban transport pricing. The approach adopted is purely descriptive.

The study concludes that, almost all expenditure on urban transport comes from general national taxation and is distributed from national government to local government agencies through financial agreements. (Exceptions are the contributions made by public transport fares and parking charges.) Therefore, legal, institutional and political issues affecting the relationships between national and local governments are clearly likely to have significant influence on expenditure decisions. In addition, a number of important transport related taxes (e.g. fuel tax, vehicle licensing and vehicle purchase tax) are typically significant contributors to general national tax receipts and, therefore, their levels are normally set in the context of political objectives regarding the national budget rather than in relation to economic efficiency objectives for transport.

Regarding public transport, it is noted that nearly all EU member states were considering deregulation and privatisation in order to achieve perceived economic benefits from the introduction of more effective market mechanisms. This may have contradictory impact to be to any attempts to introduce government intervention in the market for urban transport in order to correct for externalities, as implied by marginal cost pricing theory. Regarding the legal and institutional provisions for integrated urban transport pricing, it is found that no legal foundation to promote integrated pricing approaches exists in most EU member states. This is likely to delay progress towards implementation and the study suggests that achieving public and political acceptance of integrated pricing policies might be the key to new legislation being put forward.

Project EUROTOLL (<http://www.cordis.lu/transport/src/eurotoll.htm>) undertakes an in-depth investigation into the effects of road pricing and tolling strategies on mobility and transport, with particular emphasis on improving the efficiency of transport demand management strategies (European Project for Toll Effects and Pricing Strategies).

The project is based on 10 urban and interurban case studies in Europe. The issues of institutional and legal barriers to implementation are not explicitly addressed. However, an approach related to toll fee acceptance is developed. In this context, emphasis is placed on integrating the effective publication of information regarding the objectives and the details of the measures into the pricing strategies.

Project OPTIMA (<http://www.its.leeds.ac.uk/projects/optima/index.html>) defines combinations of policy measures, including pricing, which achieve optimum economic benefit in urban transport systems (Optimisation of Policies for Transport Integration in Metropolitan Areas). Although primarily a modelling study, it also includes consultation with policy-makers in nine case cities. As part of this, a questionnaire was conducted to assess the feasibility and acceptability of the optimum strategies. The approach is extremely general and feasibility is analysed under three headings: financial, legislative and practical. In addition, a somewhat undefined question is included regarding barriers to implementation. In practice, it is found that feasibility, barriers to implementation and acceptability are closely inter-connected and that policy-makers tend to flag problems in more than one area related to a single issue.

The most frequent concerns are related to financial feasibility, indicating implicitly that the prevailing legal and institutional structures may hinder investment in urban transport, even when there are likely to be economic benefits as a result. Indeed, the introduction of new urban transport pricing regimes (including public transport fares, parking charges and road pricing) is often motivated by the need to raise revenue to finance other measures without violating local budget constraints. Under legislative feasibility, a need for new legislation to facilitate policy packages which include road pricing and/or charges for privately owned parking capacity is identified. Second, some existing legislative barriers to controlling fares and subsidies in public transport are identified. In particular, it is noted that deregulation of bus services in the UK prevents public control of fare levels, and that anti-inflation legislation in Italy imposes fare increases and corresponding reductions in subsidies. Regarding practical feasibility,

making major changes to public transport operating practices and costs is considered to be a serious problem.

Project CAPRI (<http://www.its.leeds.ac.uk/projects/capri/>) summarises (Deliverable 4) briefly the legal and institutional position of EU member states with regard to road pricing (Concerted Action on Transport Pricing Research Integration). The summary concludes that, with the exception of Norway (where urban road pricing systems already exist), only France, Greece, Italy and the United Kingdom have, to date, made moves towards legal frameworks which allow charges to be levied for using urban roads. It also raises the issue of conflicts of interest between national or regional levels of government, at which legal provisions to permit urban road pricing would need to be made, and local urban government authorities, which would need to take primary responsibility for implementation.

2.2 Other research

In addition to EU research, a number of real-world feasibility studies addressing innovative approaches to urban transport pricing have considered organisational implications, including any serious legal and institutional barriers. Here we shortly summarise the results of The London Congestion Charging Research Programme and the Dutch experience related to the plans to introduce marginal cost road pricing in the Randstad area.

The London Congestion Charging Research Programme

The London Congestion Charging Research Programme investigated the potential for introducing urban road pricing in a UK context, and provided a thorough examination of issues related to administration, enforcement and general feasibility of implementation (The MVA Consultancy, 1995). Although issues related to the basic legal provisions needed to enable road pricing and institutional arrangements for the management of the system were not explicitly included within the scope of the London Congestion Charging Research Programme study, it produced a number of interesting findings also in this respect.

Related to *administration and enforcement*, the study noted that, even for state-of-the-art electronic charging systems, current technology cannot be relied on to identify and deal with deliberate abuses effectively. As a result, it was concluded that a significant manual enforcement function would be required to facilitate the introduction of any urban road pricing system, with associated cost and organisational implications. As part of this, it was considered that differentiation of road pricing charges between users (e.g. based on vehicle type or time of travel) could be both extremely difficult and prohibitively costly to achieve in practice, except for the very simplest scenarios. In other words, the study raises the possibility that organisational issues may place constraints on the level of charge differentiation which is feasible beyond those which are apparent from a purely technological perspective.

The most appropriate enforcement mechanism was considered to be a financial penalty set to a level which provides an effective deterrent to non-compliance and which, preferably, covers the enforcement costs. It was concluded that the majority of abuses should be covered by civil law, along similar lines to prevailing procedures for dealing with unpaid charges and penalties for parking, and that only serious abuses, such as counterfeiting, fraud and attempts to disrupt the operation of the charging system, would be covered by criminal law. In London, it was estimated that there would be between 250,000 and 5 million potential 'transactions' of the system per day (depending on its geographical coverage and design). The proportion of these requiring administrative and enforcement activity, either due to deliberate abuse or as a result of any unintentional problem, was seen as critical to the organisational feasibility of the system, both on a regular day-to-day basis and when exceptional circumstances occur.

From a marginal cost pricing viewpoint, this suggests that some aspects of system design which are both theoretically desirable and technically feasible may, nevertheless, need to be ruled out if they have potential to result in significantly greater administrative and enforcement efforts than other simpler alternatives. Besides the efficiency implications of increased operating costs, there are serious legal, institutional and acceptance related concerns associated with the possibility that the level of administration and enforcement required to safeguard system credibility may be beyond the capabilities of the institutions involved.

Related to *general feasibility of implementation*, it was noted that both existing legislation and acceptability concerns could provide a barrier to certain payment mechanisms, which may not easily be able to combine accountability of the charging system with sufficient privacy and anonymity provisions. This is important for marginal cost-based pricing approaches, because such problems are most likely to occur with charging systems which relate financial transactions to particular journeys, rather than adopting less specific periodic payments.

On required legal and institutional provisions for urban road pricing, the report for London recommends that enabling legislation should explicitly provide for the establishment of a new dedicated institution (the *congestion charging authority*), with responsibility for detailed design, implementation and operation of the charging system, rather than relying on the existing institutional framework. It also suggests that the legislation should include decisions in principle on the uses of net revenues, to help ensure public support and safeguard the urban economy.

In particular, as a result of applied modelling work, the report concludes that the effectiveness of road pricing for reducing congestion and pollution would be greater if accompanied by supporting measures to improve public transport. Therefore, it implies that the legislation should be designed to facilitate the use of revenues to fund appropriate public transport schemes.

Finally, the report concludes that policy-makers would need to balance the desire to achieve overall area-wide efficiency benefits against avoiding significant local disbenefits, which may be perceived as unfair and, therefore, make the system socially

and politically unacceptable. Some of these issues may point towards respects in which the pragmatic objectives of policy-makers and the legal and institutional culture they work within is not entirely compatible with the principles of marginal cost pricing theory.

The Dutch experience

The Netherlands has an impressive record in the design, announcement and subsequent withdrawal of detailed plans that aim to implement marginal cost pricing in road transport. These plans are typically targeted primarily at road traffic congestion in the Randstad Area (Amsterdam, Rotterdam, Den Haag and Utrecht; the dense central-west part of the country), which is viewed by most policy-makers as the most significant transport externality requiring urgent attention.

In The Netherlands some experience on the legal and institutional issues of marginal cost pricing has been gained relating to the *Rekeningrijden* (In October 1994, the Dutch parliament agreed in principle to the introduction of *rekeningrijden*: a system of electronic toll-cordons around the four biggest cities in the Randstad area, involving more than 70 toll-points, designed such that entrance into these cities without paying a toll (but using roads) was virtually impossible. In the summer of 1998, the rekeningrijden measure was included in the Coalition Agreement of the current cabinet. In the course of 1999, severe opposition against the rekeningrijden scheme led to the responsible Minister revising (as in ‘scaling down’) the plan significantly. Currently, the Dutch parliament is discussing the Minister’s latest mobility plan, in which the number of toll points in the Randstad area has reduced from over 70 to just 11 and in which a number of additional pay-lanes are foreseen. For more details see Boot, Boot and Verhoef (1999), who list the and comment on plans that have been proposed and abandoned over the recent decade.

Another aspect about the Dutch experience on the failed introduction of Rekeningrijden, according to the original plan, that might have relevance outside The Netherlands pertains to the role of different government levels during the prior negotiations and discussions. Three levels of government played a role: the national government, the provinces affected, and the cities affected (in particular the four main cities). The national and city governments, however, were most actively involved in the discussions surrounding rekeningrijden. The national government is responsible for the major highways in The Netherlands, on which peak hour congestion is most visible.

The Dutch experience and related research has demonstrated convincingly the importance of various barriers to the introduction of marginal cost pricing in road transport. Verhoef *et al.* (1996) considered such barriers from the perspective of different types of ‘feasibility’ of policies. Table 2.2 is based on their classification. The table reflects the most important types of barriers as identified by, for instance, Jones (1998), Schlag and Teubel (1997), Verhoef *et al.* (1997) and Rienstra *et al.* (1999).

<i>Narrow social feasibility</i>	<i>Broad social feasibility (additional factors)</i>	<i>Other feasibility concepts</i>
<ul style="list-style-type: none"> · Numbers of winners and losers · Types of winners and losers (<i>e.g.</i> individuals <i>vs</i> firms) · Intensity of welfare changes 	<ul style="list-style-type: none"> · Communication of the concept · Allocation of tax revenues · Effect on income distribution and (perceived) equity · (Perceived) fairness · (Perceived) effectiveness · Agreement with policy goals: problem perception · Anonymity and privacy · Way of introduction · Adjustment possibilities for road users · User-friendliness · Reliability · Transparency · Familiarity · Economic feasibility · Technical feasibility · Institutional feasibility 	<p><i>Economic feasibility</i></p> <ul style="list-style-type: none"> · Broad economic efficiency or social benefit-cost ratio (<i>i.e.</i> taking into account the costs of regulation) <p><i>Technical feasibility</i></p> <ul style="list-style-type: none"> · Availability of technologies · Reliability <p><i>Institutional feasibility</i></p> <ul style="list-style-type: none"> · Level of organization (lobbies) of winners and losers · Relative strength of interest groups · Possibly conflicting interests of different public institutions (<i>e.g.</i> different spatial levels of government) · 'Unexpected' institutions voicing strong opinions: mass media, consumer organizations, employers' and employees' unions, etc. <p><i>Legislative feasibility</i></p> <ul style="list-style-type: none"> · Compatibility with legal framework <p><i>Political feasibility</i></p> <ul style="list-style-type: none"> · All other feasibility concepts · Personal perceptions of politicians · Party-political factors · International political constraints

Source: adapted from Verhoef *et al.* (1996)

Table 2.2. Different feasibility concepts relevant for road pricing

Verhoef *et al.* used the term *institutional feasibility* to refer to the ease with which a proposed pricing scheme can be implemented from a legal and institutional perspective. (Similarly, the term *technological feasibility* refers to whether the required technology exists, whether it can be used with a sufficient degree of reliability, etc.) As subconcepts to institutional feasibility, they used the terms *legislative feasibility* and *political feasibility*. In particular, the latter refers to the assessment/measurement of the importance of those factors that may affect responsible politicians in their voting behaviour.

In the first place, one would expect politicians to base their views on evidence available with respect to all other feasibility concepts. In addition, in a coalition democracy, party-political factors, expected duration to the next elections, voting-deals and swaps, personal perceptions and personal future plans of leading politicians, and possibly even attendance of the Members of Parliament during voting, may eventually tip the balance in favour of or against politically sensitive decisions such as the implementation of road pricing.

The *narrow social feasibility* focuses on standard economic concepts including consumers' surplus, such as the level of the fee, the value of total travel time, and the extent to which individuals benefit from revenue recycling schemes. Assuming perfectly rational individuals, optimal road prices, non-excessive costs of implementation, and sufficient flexibility in designing targeted recycling schemes, this narrow social feasibility could in principle be positive. Optimal taxes by definition lead to a net

welfare gain (otherwise they would not be optimal), and when recycling can be targeted well enough, any such potential Pareto improvement should in principle be transferable into a strict Pareto improvement in which everybody is better off due to road pricing. Judging by the extent of opposition, one or more of these assumptions is in practice not met, or – moving into the second column of Table 2.2 – the benefits of road pricing are not being communicated clearly enough to the public at large.

Indeed, the poor communication of the concept may be one of the important factors negatively affecting the *broad social feasibility* of road pricing, defined as the overall degree of social acceptability. Advocates of road pricing may not always be clear enough in explaining that external costs are ‘real economic’ costs, that the benefits for a certain group of ‘marginal’ users do not outweigh the total costs including those imposed on others and hence efficiency gains are to be reaped, and that tax revenues should not be counted as a social loss (contrary to the popular view of the car as a cash-cow), but *could* be used to (more than) compensate the initial losers instead. Other important issues affecting the broad social feasibility, frequently mentioned in the literature, include the perceived equity and fairness of the system, the perceived effectiveness (why pay if nothing will change?), and the agreement with the policy goal(s) by indeed perceiving the targeted social problem as a real and important problem. More practical considerations would for instance be the transparency, user-friendliness and reliability of the system, along with its implications for privacy (which is probably not so much of an issue once smart-card systems instead of monthly detailed bills are used).

The third column of Table 2.2 contains some other feasibility concepts, certainly not necessarily less important than the *social feasibility*. The first of these is the *economic feasibility*, basically depending on the question of whether the welfare benefits realised with a particular form of road pricing outweigh the administrative and technical costs of operation.

In reality, none of the feasibility concepts as distinguished in Table 2.2 can be considered in isolation. Of course, social feasibility will directly affect political feasibility in a democracy. Technical and economic feasibility will affect social and political feasibility. And so forth. Therefore, Table 2.2 is primarily meant to present some important angles and perspectives that can be taken when studying the feasibility of a certain policy. It is also impossible to identify one single major type of feasibility that has prevented the introduction of rekeningrijden in the form originally envisaged. However, one possible interpretation is that the political feasibility was undermined by a limited institutional feasibility and a declining broad social feasibility, which in turn itself was due, too, to a limited institutional feasibility.

3 Theoretical approach for analysing legal and institutional issues

Agreeing on the theoretical approach/framework is a precondition for carrying out a theoretically sound analysis of legal and institutional issues; otherwise the analysis would reduce to a mere listing and separate consideration of different location-specific practical cases with no generalisations. In particular, in relation to legal and institutional issues of marginal cost pricing in urban transport, much of the work aiming at theoretically sound and realistic policy conclusions must involve building a bridge between the different theoretical approaches and aspects.

6. Owing to the great multitude of issues covered, this study does not rely on any single theory. Rather, its approach is to draw together elements from several theories and disciplines, and in addition pay specific attention to practical location specific and often detailed issues which can be extremely important to the decision-makers. An important distinction is made between:

- (i) the approach to investigating the legal and institutional status quo; and
- (ii) the approach to investigating the institutional reform.

This section provides an overall view of the theoretical approach, covering both economic and non-economic aspects. Section 3.1 discusses the approach to investigating the legal and institutional status quo; section 3.2 discusses the analysis of institutional reform.

3.1 Analysing the legal and institutional status quo

7. The economic-theoretical foundation for the analysis of this study is provided by *neo-classical economics*. This is natural, as the theoretical basis of marginal cost pricing builds on neo-classical argumentation. Other important theoretical disciplines or traditions providing insights to the analysis are *institutional economics* (new and old) and *game theory*. However, all these theories are only affecting more or less implicitly behind the argumentation, as no formal models reflecting them will be presented. But this of course in no way undermines the importance of these abstract theoretical considerations to this study.

Typically, the neo-classical approach takes relevant actors (organisations, institutions, etc.) as given, and focuses on their behaviour in the market (in terms of demand and supply). It focuses on the equilibrium, and on the efficiency and distributional properties of market outcomes. Of course, when considering long-run steady state equilibria (in which only the strongest organisations have survived), the neo-classical theories assume variable number of organisations (firms). In particular, the standard textbook model of perfect competition assumes that the long-run equilibrium arises due to free entry and exit of (though admittedly identical) firms.

Typical implicit assumptions of the neo-classical analysis are the variable character of all costs in the long-run, the long-run perfectness of information, the long-run reversibility of investments, and free entry and exit (implying that market power will persist only when supported by cost structures). When these assumptions are met sufficiently closely, they justify the typical concern with unique and deterministic long-run equilibria. The neo-classical analysis typically ignores aspects as path-dependency and costs of transition.

Another important characteristic of a typical neo-classical analysis is that, related to market transactions, transaction costs are assumed away. This assumption reflects the fact that the approach focuses on market outcomes, and on the inter-relationships of various economic agents (consumers, firms) in the market. The neo-classical theory assumes that transaction costs are internalised by the firms and consumers in their own private accounts, or that they are insignificant.

While the neo-classical theories are not primarily concerned with evolution and transition dynamics and transaction costs, these issues are the main focus of institutional economics (new and old).

The game-theoretic nature of the interactions between organisations (government and non-government), and also between individual cities is obvious. These issues can be analysed in a model of institutional competition, cast in a game-theoretic framework.

8. While the approach of this study builds on fundamental economic principles, it also extends the viewpoint to cover all relevant non-economic perspectives and academic traditions such as political, acceptability, etc. Many legal and institutional issues of marginal cost pricing in real-world are likely to fall outside the scope of the economic theory. The scope of the standard economic analysis is too narrow to meet all the requirements of policy-makers.

A comprehensive analysis of the key features and aspects and critical requirements of marginal cost pricing in relation to legal and institutional issues must adopt a broad multidisciplinary approach. In particular, many issues connected to human attitudes and relationships – at the individual or corporate level – may conflict with the standard behavioural assumptions of economic analysis, and thus may be unforeseen. Therefore, they may be hard to analyse in terms of standard economic concepts only.

Policy-makers may easily agree that marginal cost-based pricing principles, especially when complemented by non-economic considerations, make sense in the two-dimensional world represented on a piece of paper, but will, typically, refer back to a considerable number of practical complications when asked to consider it in the context of their own city.

There may also be issues which are harder to categorise, related to case-specific detailed implications of adopting a marginal cost-based pricing policy and to the relationships – public and personal, formal and informal – within and between institutions, which are of considerable practical and political importance to policy-making, but which are not

addressed at all by the academic theories. Even the most basic theoretical principles, such as the desire to optimise economic efficiency, may be undermined by such unforeseen complications.

9. In addition, in practice, many legal and institutional issues may be extremely case-specific or microscopic, i.e. likely to greatly vary by site and thus to be suitable neither for abstract theoretical nor comparative empirical (economic and non-economic) analysis. This study will pay careful attention to such detailed practical barriers affecting the implementation of marginal cost pricing at the local level, which are endemic to real-world policy-making in an urban transport context.

3.2 Analysing institutional reform: economic welfare analysis

10. A major driving force behind any sensible plan to introduce marginal cost pricing must be the welfare benefits that might be available through it. Therefore, the analysis of legal and institutional barriers to marginal cost pricing and of a related institutional reform must ultimately include or be linked to quantitative *welfare analysis* (if not explicitly then implicitly at least). A highly relevant question from the viewpoint of reaching theoretically sound and realistic policy conclusions is the ability of the prevalent conceptual economic and applied real-world models – focusing on optimising marginal cost based pricing measures and policies and estimating their welfare effects – to properly allow for the legal and institutional issues.

11. An intuitively appealing and sound theoretical basis for the quantitative welfare analysis is provided by the economic second-best theory (much of which, in turn, is based on neo-classical economics). In the applications of this theory, typically, the second-best cases represent true real-world situations, whereas the role of the first-best cases primarily is to serve as a benchmark only. A critical insight of this study is to consider the legal and institutional barriers as second-best constraints which (on their part) prevent the transportation system from achieving a fully optimal first-best state. Considering the legal and institutional issues within the framework of the second-best theory also links this study to the other AFFORD deliverables.

12. An essential part (though sometimes implicit) of any welfare analysis is the comparison between the best practice second-best and the first-best benchmark. The second-best constraints and distortions – here due to a range of legal and institutional barriers – always have, by definition, a negative welfare impact as compared to the first-best. The definition of a *first-best benchmark* is almost trivial in a stylised textbook model. In particular, a standard textbook model assumption is that, in the first-best there are affecting no legal or institutional (or of any other kind either) barriers (constraints, distortions) at all. Rather, a first-best typically assumes a single homogeneous (perfectly co-ordinated, internally logical) government agency, with full legal power and institutional capability to secure the most efficient and fair solution. In practical policy applications, however, the definition of a first-best may not be quite that simple.

In practical applications, it may not be self-evident what the first-best should cover – e.g. what it should include as variables and what take as given as facts of life. It is realistic to assume that a typical first-best may include certain fundamental legal and institutional assumptions, and also that some of them may reflect clear barriers/constraints (i.e. may have a negative welfare impact as compared to other potential and more ambitious first-best states which however were considered as overly unrealistic or theoretical). However, obviously, all those legal and institutional barriers which are incorporated in the first-best benchmark should, from the perspective of transport pricing, be such that they cannot be affected by policy-makers responsible for the implementation of marginal cost pricing (but are taken as given).

Existing applied models of urban transport typically have no explicit facilities to allow consideration of the impacts of institutional reform (legal and institutional change), because this is normally an issue beyond the scope of local urban policy-making, for which such models are designed. This does not necessarily mean that such models cannot be used to test different legal and institutional scenarios, but it does imply that they are likely to be dependent on external inputs to represent the detailed transport implications of reform and that they may not always include the desired variables or flexibilities for setting them. The situation is specific to the analysis of legal and institutional issues, and is a reflection of the extent to which it has been peripheral to most previous academic work on urban transport pricing.

Another problem affecting the quantitative welfare analysis in relation to institutional reform are the gaps which still exist between different disciplines. Second-best economic theory, even though recognising the existence of legal and institutional barriers, typically addresses them only on a general and conceptual level. As part of this, the government is treated as an entity with straightforward and logical behavioural characteristics – typically derived from a clearly defined objective to optimise the economic efficiency of the transport sector. However, the activities of the government in real-world policy-making tend to be significantly more complex and rather less clear-cut.

Existing applied (empirical) model applications and work on acceptability often provide good representations of behavioural responses to practical policy innovations. However, while providing important information to policy-makers these approaches, when assessing specific foreseen reforms within the transport sector, typically make no systematic and theoretically sound distinction between the best practice second-best and the first-best benchmark cases. In particular, even though these approaches may incorporate existing legal and institutional conditions and structures into their analysis (explicitly or implicitly), they do not adopt a clear theoretical economic welfare foundation. Therefore, they are unlikely to consider a comparison between the second-best and first-best optimum cases reflecting legal and institutional barriers and constraints either.

An important reason for why applied models typically are not able to distinguish between the second-best and the first-best is that they tend to assume the current legal and institutional situation as fixed. An important reason for this, in turn, is that these

models are generally created and used at the local level where policy-makers work within a given legal and institutional framework and consider that they have little scope to change it. The appropriate elements may be implicit and fixed in the model structure and data rather than reflected by the variables to be tested.

Similarly, existing works on acceptability and acceptance also tend to focus on prevailing legal and institutional structures, because of their inherently reactive approach: they are asking questions in response to a limited number of given scenarios vs. focus groups which explore all the issues and then start to talk about policy, which might be referred to as proactive (i.e. respondents are expected to give answers based on the assumption that the current status quo will continue except for any specific aspects indicated to them). In some cases this may limit consideration of legal and institutional reform within these approaches, due to either a lack of appropriate variables or to certain critical issues being otherwise wholly external to the model structure.

More generally speaking, while economic analyses typically overlook important details and imperfections (they often do this on purpose), applied empirical model applications have often overlooked the importance of having a sound economic and welfare theoretical background. Therefore, they cannot provide a tried and tested link to the welfare economics and the optimisation idea that is central to marginal cost pricing. (Sure, the applied modelling and acceptability studies may often have a very sound theoretical foundation for representing and understanding other than economic aspects of actual human behaviour.)

The analysis of legal and institutional aspects of marginal cost pricing, aiming at realistic and plausible policy conclusions, has to balance between these two approaches and worlds. From the viewpoint of practical policy-making, integration of general principles and specific practical considerations, through better integration of these different traditions, is critical for addressing legal and institutional issues.

4 Key concepts and issues

Section 3 above described the theoretical approach to the analysis of the legal and institutional issues of marginal cost-based pricing. The discussion was on a general level. This section discusses the key concepts and issues in a more detailed level.

13. The discussion on the key issues and definitions covers:

- (I) marginal cost-based pricing policies and measures;
- (II) settings – different perspectives and scopes for policy-making;
- (III) relevant institutions and organisations; and
- (IV) legal and institutional barriers to marginal cost pricing.

These topics are addressed in sections 4.1-4.4 respectively.

4.1 Marginal cost-based pricing policies and measures

14. The theoretical and empirical economic literature dealing with marginal cost-based pricing policies and measures is vast and well-developed. The literature covers the whole range of issues from abstract underlying theoretical ideas and principles to the details of practical pricing measures and specific marginal cost-based policy packages. An important distinction is *first-best pricing vs. second-best pricing*, corresponding to the fundamental distinction the economic theory makes between first-best and second-best cases.

Both first-best and second-best pricing should be considered as marginal cost pricing: second-best pricing is marginal cost pricing under second-best constraints. The difference is that, in the second-best case, a part of the marginal cost price is made up of the shadow price (the Lagrangian multiplier, in mathematical terms) created by the imperfection of the instrument considered. However, a shadow price also reflects a real economic cost. Given this constraint, second-best pricing is a form of marginal cost pricing in which not all margins of behaviour can be affected in a fully optimal way.

An important classification of the relevant second-best pricing cases distinguishes between situations where:

1. a first-best price cannot be implemented but a second-best price can; and
2. a first-best price-rule could, in principle or naively, be implemented, but would not be optimal because in fact a second-best price rule would be needed.

The idea in the latter case is that the policy-maker in principle could apply a first-best price (or, more correctly, a first-best rule) on an individual route or mode even though there are distortions or constraints in the alternative routes/modes/sectors or in the way revenues can be used. But this would not be optimal – instead, it is optimal to apply a more complicated second-best rule (and the corresponding second-best price). Though this distinction is particularly important from the point of view of conceptual second-

best theory, it is less important from the point of view of institutional analysis and is not considered here further.

15. AFFORD Deliverable 1 (Milne, Niskanen and Verhoef, 2000) presented an overall view of these issues, and of conceptual economic and real-world models available for their analysis. The deliverable concluded that serious gaps still exist between the economic theory and real-world modelling on one hand, and the theory (and modelling) and practical policy-making on the other. These considerations provide the theoretical economic and modelling basis for this study.

The marginal cost pricing addressed in this study is *marginal social cost pricing*, which can be defined as a pricing policy that tries to affect behaviour as efficiently as possible, i.e. such that to promote socio-economic efficiency, given the constraints of the policy considered. It also allows for equity, to the extent that the polluter-pays principle is considered to be fair. The term marginal social cost pricing means *marginal externality cost pricing* as applied by the government. This must be distinguished from marginal cost pricing as applied by transport service and infrastructure operators (private or public), which under suitable conditions may end up with marginal cost pricing from the profit maximising (or cost-minimising) perspective.

16. Practical marginal cost-based pricing measures or instruments available for representing marginal cost pricing in practice currently, and addressed in AFFORD Deliverable 1, include:

1. road or congestion pricing,
2. parking pricing,
3. public transport fares and subsidies, and
4. taxes on car ownership and fuel or vehicle-kilometre based.

The deliverable emphasised that, in particular in second-best situations, it is appropriate to consider marginal cost based policy packages which use these individual pricing measures in combination, and in combination with other measures related to revenue use, investments, etc.

In the *marginal cost-based pricing policy packages*, various individual charging measures are typically combined with measures or schemes to distribute the revenues and welfare benefits. In addition, the policy packages may include also subsidy/investment schemes to create welfare benefits or increase acceptability.

17. Deliverable 1 presented illustrative examples of such marginal cost-based pricing policy packages. The so-called *weak or acceptable package* assumes relatively low charges and earmarked revenue use. The so-called *strong or best practice second-best package* assumes relatively high charges, while much of the revenues are used to lower labour taxes (with no earmarking).

18. The welfare effects and acceptability of these two – and other similar – packages have been further investigated in parallel AFFORD Deliverables 2a and 2c respectively (Fridstrom et al, 2000; Schade et al, 2000; and Schade and Schlag, 2000). This study (Deliverable 2b) will analyse these packages from the legal and institutional viewpoint.

4.2 Settings – different perspectives and scopes for policy-making

19. AFFORD Deliverable 1 distinguished between different *perspectives and scopes for marginal cost pricing related policy-making* in urban transport. The deliverable adopted the notion of *settings* to incorporate the whole range of such perspectives and scopes. More specifically, four settings were introduced, and they were (slightly modified here) the following:

- (1) focussing on marginal cost pricing within road transport;
- (2) considering marginal cost pricing for multi-modal transport;
- (3) focussing on marginal cost pricing in a spatial and geographical context; and
- (4) covering inter-sectoral aspects of marginal cost pricing.

These settings are thought to provide a comprehensive range of actual real-world marginal cost pricing related policy-making situations with varying scope and coverage.

Naturally, there is considerable overlap and interaction between these settings. However, the rationale for considering them separately of course is that in practice transport pricing schemes – and the corresponding revenue use schemes – may be designed and implemented at different levels of the policy-making process and may have different coverage and scope. There are at least two important reasons for this. First, this may be efficient and practical, given the wide range of possible pricing (and redistribution) measures involved. Second, in the real-world, governments are not always entities with logical behavioural characteristics and clearly defined consistent objectives. There may be within a country tension between different government levels (also between national governments and the EU), and government functions may not be sufficiently integrated to provide a hierarchy of consistent policy-making from national to local level. As a result, in practice, there is a division of responsibilities between different functions (roads, parking, urban public transport, general taxation etc.) and also spatially (national vs. local, neighbouring local areas etc.) – and the settings defined here just reflect this fact.

20. This study will consider these settings separately and will identify the whole range of key legal and institutional issues (that may affect the implementation of marginal cost pricing in urban transport) specific to each. As there evidently is much overlap and interaction between the settings, these will be paid particular attention too.

4.3 Relevant institutions and organisations

Regarding the relevant institutions and organisations, a sound analysis requires abstract definitions, to be illustrated (operationalised) by means of comprehensive list of practical examples. Abstract (yet operational) definitions of key concepts such as *organisation* and *institution* can provide benchmark characterisations which apply to the whole range of situations and circumstances covered. Of course, transparent definitions, which describe characteristics essential and common to all the relevant organisations

and institutions, are also necessary for common understanding between the different disciplines.

21. The theoretical and applied literature presents a number of abstract *definitions of organisation and/or institution*. However, such definitions have not previously (to our knowledge) been explicitly linked with marginal cost pricing issues in urban transport.

Such definitions include the following: An institution is any set of human beings and explicit or implicit contracts. Or: institutions are arrangements, which form similar recurring actions of individuals and relations between them and the society. And: An institution is a group of individuals, or even a single person, with influence or power in a particular sphere of society, based on explicit or implicit contracts which govern the actions and the form of the institution.

Another definition by Scott (1995) states: “Institutions consist of cognitive, normative and regulative structures and activities that provide stability and meaning to social behaviour. Institutions are transported by various carriers – cultures, structures, and routines – and they operate at the multiple levels of jurisdiction.” Obviously, all these definitions are alternative ways of expressing the same basic ideas, however, having slightly different focus and coverage.

A definition by Nobel laureate Oliver North (ref) describes an institution as *constraining the set of feasible actions*. According to this definition, for example, direct democracy is an institution that allows some actions to be taken only if a majority of voters approve the action. Interestingly, this definition sees institutions only as constraints, whereas definitions above see institutions equally well as enabling or facilitating actions, making them possible. But this may just reflect the fact that the definition is presented at a very general and abstract level.

The *actors with a stake in the urban transport* refer to all firms, agencies, and any organised groups of individuals potentially affecting or being affected by the introduction of marginal cost pricing. The notion of an actor assumes that the individuals involved have common preferences and interests, and also common goals. In principle, an actor can also mean one individual only. At the other extreme, the voting public in a democracy could be considered as a sort of collective (informal) actor.

22. The *range of relevant actors* potentially affecting or being affected by marginal cost pricing includes all organisations and institutions likely to play a significant role in the designing and implementation of a marginal social cost-based urban transport pricing system in practice. This, for example, means involvement at the different policy-making levels – local, national, EU – and during the different temporal stages of the policy process (in particular the policy formulation stage vs. the implementation stage). The relevant actors include public administrative bodies, and various organisations in the private and the third sector with varying levels of formality.

The relevant actors/organisations include those:

- (i) directly involved in decision making – different levels of government, political parties, etc.;
- (ii) responsible for putting the system into practice – local government agencies, etc.;
- (iii) facilitating the implementation – financiers, technology manufacturers, etc.;
- (iv) helping marginal cost pricing become reality, by providing information and resources – political parties, academics, consultants and banks, etc.;
- (v) with influence on opinion forming – automobile associations, employers' organisations, unions, newspapers, other media, etc.; and
- (vi) reacting to the system – political parties, automobile associations, other pressure groups and chambers of commerce, etc.

Naturally, some organisations may belong into more than one group. There are also interconnections: opinions influence decision-making etc. Individual persons may belong to more than one organisation; on the other hand, some persons alone may even be considered as a relevant actor/organisation (e.g. a particularly influential politician, journalist or academic).

Organisations of types (i), (ii), (iii) and partly (iv) and (v) can be called *expected* organisations; type (vi) and partly type (iv) and (v) organisations can be called *unexpected* organisations. This distinction e.g. proved out useful in analysing the – fragmented – implementation of transport pricing in the Netherlands (Verhoef et al, xx). In The Netherlands, there e.g. was a strong negotiation between central government and cities, where eventually the former bribed the latter into accepting some form of road pricing by offering sums of money for infrastructure expansion (both road and rail).

Different actors/organisations have different roles in getting from a policy that is justified in technical terms, through a formal planning process to a political decision. They will be relevant to the implementation of marginal cost pricing in a non-binary, gradual importance. Clearly we can ignore The Beatles, who are an institution in their own right but rather irrelevant for the questions studied – apart from those that claim the lyrics to the chorus of Drive My Car or Taxman as a political statement still relevant for contemporary transport pricing policies, driving public attitudes. However, in general some degree of arbitrariness in the ex ante selection of the organisations studied in an empirical study like the present one is unavoidable.

In particular, adopting electronic technology almost certainly means incorporating private electronics companies and financial institutions (with their commercial interests) into the team of institutions implementing the system. Organisations with control on technology have influence on policy. For example, a commercial technology manufacturer or financier may wish to safeguard their investment by pushing general policy towards raising revenue, in addition to negotiating a profitable deal for themselves. At the extreme, there is a possibility of 'uneven political influence', i.e. that involvement of a large multinational company – with influence over national government – for technology or finance, alongside local government, small local bus operators etc. may end up with them running the city rather than the elected body.

23. Besides actors, this study distinguishes between two other types of institutions: agreements/contracts external to an actor, and agreements/contracts internal to an actor. The *agreements or contracts external to an actor* govern its external relationships in relation to other actors (also beyond the transport sector). They define the legal and institutional structure or system within which the actors operate. These can be formal agreements/contracts like laws but can also mean informal interdependence between actors, through competition or co-operation in the market, through the political system, etc. They may also cover broader socio-economic systems and structures – the political system, markets, etc. The *agreements or contracts internal to an actor* govern internal functions and structure (actions, forms) of an actor and link individuals involved in (working for) it together. Again, the relevant agreements/contracts can be explicit or implicit, formal or informal, and can differ widely in character from public agreements/contracts like laws to cultural conventions.

24. This study adopts the following terminology: 1. the term *organisation* is used to specifically refer to actors – firms, agencies or any organised groups of individuals – especially when focusing on internal agreements/contracts, i.e. the internal structure; and 2. the term *institution* is used as a general concept which covers both actors/organisations when focusing on external agreements/contracts, i.e. the relationship vis-a-vis other actors – as well as all kinds of legal and institutional agreements/contracts (external and internal) between them.

4.4 Legal and institutional barriers to marginal cost pricing

25. From the viewpoint of marginal cost pricing, the legal and institutional agreements/contracts (external and internal) may affect as either enablers or barriers. That is, they can facilitate the implementation of marginal cost-based pricing policies, but also can create distortions to the efficient functioning of the (transport but also more generally) markets or can place limits or constraints on the available and feasible policies.

26. The *legal and institutional barriers to marginal cost pricing* may appear on the charging side and the revenue use side. From the viewpoint of marginal cost-based pricing policy, they can be either given facts of life or removable. Important examples of the former type of barriers are *policy related* barriers: potential conflicts between the marginal cost-based pricing principles and policies on one hand, and the prevailing national (and EU) level policies in the transport sector and beyond and aiming to different and often more general goals on the other. The *removable barriers* are dependent on transport pricing related agreements/contracts, laws, etc., and thus in principle can be influenced and corrected to better conform with the requirements of marginal cost pricing. Evidently which legal and institutional barriers should be taken as given in any particular case partly depends on the scope and perspective of decision-making, i.e. on the setting.

For example, even if it were legally and institutionally possible to introduce marginal cost-based road user charges, a desirable policy package may still fail because

appropriate measures to compensate road users and provide welfare benefits to the travelling community fall foul of legal and institutional barriers (e.g. due to ineffective co-operation between national and local government).

The affecting national or EU level policies – regulation, fiscal tax policy, etc. – aiming at more general goals, may be difficult to influence or change for the benefit of urban transport. Both examples can be regarded as representing external agreements/contracts. The national-local dimension may be critical regarding both the charging and the revenue use (expenditure) side. This point may be one (uncredited) reason why it was easier for Singapore, as a city-state, to introduce pricing – there were fewer national-local policy-making barriers to deal with. It may be true that it is easier to introduce a pricing system in a capital city (or reasonably independent regional centre), because there is scope for better co-operation between the different levels of policy-making is more of the relevant individual live and work there.

Naturally, also settings 1-4 such as defined in section 4.2 above reflect certain legal and institutional assumptions or structures/systems – and as such also potential barriers to marginal cost pricing. However, the assumption here is that these structures/systems and hence the related barriers will be taken by politicians responsible for the implementation of marginal cost pricing as given. They represent facts of life which equally hold for the first-best benchmark scenario and for the best-practice second-best scenario. (Obviously a separate operational definition, though of course with much overlap, of first-best within each of the four settings is needed.) However, in principle, and especially in the longer run, also the legal and institutional structures/systems behind the existence of the settings can be seen as potentially removable barriers. In this case, the coexistence of the settings and of the corresponding different policy-making levels, with their different scopes, can be seen as a constraint the prospects for the removal of which the politicians and analysts should consider.

27. The legal and institutional barriers may cause distortions which, corresponding to the four settings, can be classified as being: 1. intra-modal; 2. inter-modal; 3. spatial and geographical; or 4. inter-sectoral. The *intra-modal distortions* relate to the imperfect ability of pricing measures to differentiate between different types of users, and to differentiate between users in time and/or between routes. These issues will be addressed when focusing on marginal cost pricing within road transport (setting 1). The *inter-modal distortions* include issues related to an integrated pricing system and barriers to efficient (possibly earmarked) use of revenues within the transportation sector. These issues are most relevant when considering multi-modal transport (setting 2). The *spatial and geographical distortions* (including land use issues) are critical when focusing on marginal cost pricing in a spatial and geographical context (setting 3). Finally, the *inter-sectoral distortions* become relevant when covering inter-sectoral aspects of marginal cost pricing (setting 4) – such as the relation of marginal cost pricing in (urban) transport to general fiscal taxation, redistribution of revenues across sectors and the associated shadow price of public funds. Therefore, within each setting, potentially different set of legal and institutional barriers may be considered as a contributory cause for the second-best constraints/distortions, and a different range of best practice second-best cases vs. the first-best benchmark can be defined.

A further important dimension for considering different types of legal and institutional barriers is the temporal one. Disaggregating temporal stages of the policy process – the policy formulation stage and the implementation stage – may help to provide important insights into where barriers lie. For example, if marginal cost-based pricing is currently perceived by policy-makers to have unresolved problems within the conceptual and planning phases, it can be no surprise that there is unwillingness to move faster towards decision and implementation.

28. Another important distinction classifies legal and institutional barriers into:

- (i) structural barriers;
- (ii) opposition from interest groups; and
- (iii) low socio-political acceptability.

These types are discussed in sections 4.4.1-4.4.3 respectively.

4.4.1 Structural barriers

The *structural barriers* relate to government institutions or policies. They may be caused by the very existence (size, etc.) of the actors/organisations themselves (e.g. a result of perhaps erratic historical development), or by the existence (form, etc.) of the external and internal agreements/contracts governing their actions (e.g. policy related barriers). The existing inappropriate or nonoptimal organisational structure may e.g. depend on the number of policy-making levels and the corresponding need for (often) complicated agreements/contracts between the different levels. Also, it may e.g. mean an organisation which is formally in charge for the formulation and/or implementation of marginal cost pricing policy but is actually more interested – and quite legitimately – in other goals. The existing laws in contradiction with or directly preventing marginal cost pricing may be e.g. national laws related to privacy, deregulation and fiscal taxation.

29. The *structural barriers* may be caused by:

- (i) inappropriate or non-optimal organisational structures to facilitate marginal cost-based pricing and associated charging and redistribution mechanisms;
- (ii) insufficient legislation to support marginal cost-based pricing and associated charging and redistribution mechanisms, including some laws which may even appear to support contradictory objectives and/or to prevent certain measures explicitly; and
- (iii) prevailing economic and/or transport-related policies at national level which appear to be in contradiction with marginal cost pricing principles, at least in the context of the local urban transport pricing environment.

4.4.2 Opposition from interest groups

The *opposition from interest groups* to marginal cost pricing represent non-governmental actors or organisations with a stake in the urban transport. They are caused by deliberate (strategic) opposition from such organisations.

The strategic behaviour (behind interest groups) may reflect the role and/or power of an actor/organisation – in the market, public arena, etc. – vis-à-vis other actors, and it is determined by both by its physical size and the nature of its external and internal agreements/contracts. This can be either formal power of an elected or appointed body or informal power in terms of the rights of a direct action.

In reality, possible winners and losers of a certain policy may be united according to different degrees of organisation, varying from having no joint organisation at all to having a well-run, well-known or even a generally regarded as respectable organisation. In the latter case, these winners or losers will have a greater possibility in voicing their opinion and affecting public attitudes towards their own, and possibly also in affecting political decision-making.

Of course, the division line between the structural barriers and the influence of interest groups may not be always clear-cut. In particular, structural barriers of today may be a result of strategic behaviour of interest groups of yesterday.

Also, the different structure of government may lead to different policies (or types of policies) at different levels, and the attitudes of organisations (government and non-government) towards each other. Evidently, both questions are hard to classify in structured terms, and thus tend to be relevant on subjective assessment. For example, in the UK, institutions which are traditionally at loggerheads due to their general attitude to each other (e.g. national political parties, local branches of political parties, even city (local) and county (regional) government agencies, where they coexist and share responsibility for related issues) tend to oppose each other on policy issues, regardless of underlying ideology.

Verhoef et al (...) have developed a simple model to illustrate and draw together fundamental insights regarding legal and institutional barriers such as they may arise from opposition by organisations involved in (affecting or being affected by) the implementation of marginal cost pricing. The model has been applied to the development occurred in the Randstad case in The Netherlands (see section 2.2 and Annex xx).

While distinguishing between government and non-government organisations, the model assumes that the behaviour of each organisation can be characterised as pursuing the interests of two groups of individuals: those working for the organisation and those whose interests are represented by the organisation. The former are called the organisation's *representatives*, the latter the organisation's *population*.

The non-government organisations typically can freely define and attract the population they represent, and at the same time decide not to represent some other groups. Typical such organisations are unions, employer's organisations and automobile associations. The government organisations serve a population that is more exogenously given, and is normally defined by the geographical boundaries of the jurisdiction. Governments have an incentive to serve the population's interests as well as possible for electoral reasons;

the non-government organisations have a similar incentive through the necessity of maintaining long-run membership. Another (related) important difference is that the government organisations typically have a relatively more heterogeneous population than the non-government organisations – in the latter case the population selects itself through voluntary membership or, if membership is obligatory, at least shares important characteristics that define their eligibility for membership (such as enterprises in case of Chambers of Commerce).

Second, the model assumes that an organisation *pursues*, rather than *maximises*, the interests of its representatives and population. These interests may often diverge among relevant individuals, both within the population, and between population and representatives. In reality, a rule-of-thumb type behavioural function characterises an organisation's behaviour, where it satisfizes rather than maximises. Most satisfizing rules would include the objective *to prevent too great losses* for too great a share of the representatives or population, as soon as interests would diverge among relevant individuals. An underlying reason would be that the degree to which individuals would support or object to a certain arrangement may often increase more than proportionally to the size of the perceived welfare change due to this arrangement. Small welfare changes, below some threshold level, may make individuals simply not bother to get fully informed, and shape and voice a clear opinion. Disproportionate welfare gains or losses in contrast, make it worthwhile to get invest time and effort trying to influence the arrangement.

The representatives' short run objectives may not always coincide with the population's objectives, even when the population is homogeneous in the first place. In the longer run, however, such representatives are less likely to survive in their position. Therefore, although central representatives' personal opinions may have an important impact on the organisation's attitude, the *expected* organisation's attitude may more or less correctly reflect the population's interests. Though the distinction between an organisation's population and representatives may explain some 'noise' in the organisation's attitude, it should probably not be a driving force in predicting or explaining the organisation's behaviour.

A third assumption is that organisations typically have the equivalent of what in standard economics is known as *market power*. As a result of such 'market power', organisations may exhibit *strategic behaviour* in order to actively try and influence market or political outcomes, to better serve interests of their representatives and populations as much as possible. Typically, the organisations' longer-run viability would not even allow any other type of behaviour. A government not satisfizing the population's interests sufficiently would face electoral damage in a relatively short run. A non-government organisation would face increased competition (or the sheer creation) of competing organisations serving the same population. So, even if organisations do not *succeed* to fully affect market or political outcomes to the representatives' and population's interest, a failure of *attempting* to do so may affect its viability likewise, or perhaps even more strongly.

A fourth important assumption is that the implementation of a marginal cost-based pricing policy may lead to a redistribution of welfare. Marginal cost pricing, accompanied by a system of tax recycling, typically may lead to relatively pronounced welfare losses for a well-defined group of individuals, while creating relatively small benefits per individual for others (those that benefit from a reduction of other taxes, or from reduced environmental externalities – a substantial share of which may even only be enjoyed by as yet unborn individuals).

Evidently, this kind of model can be useful to generate plausible insights and explanations regarding the strategic barriers to the implementation of marginal cost pricing. In particular, the model suggests the following three hypotheses (for more details, see...):

1. The probability that the organisations representing the losers object, and the intensity of objection, are larger than for the winners.
2. The organisations have an incentive to exaggerate expected losses and/or neglect possible gains, in order to try and realise a share in the revenue allocation as large as possible, should implementation materialise. In other words, due to a strategic behaviour the resistance may seem even greater than it actually is. Support for the measure may bear the risk of signalling likely acceptance of a smaller share of the revenue allocation.
3. The failure to even *attempt* to influence the pricing scheme as much as possible in the institution's population as much as possible is unattractive when the organisation's representatives are judged by the extent to which they serve their population. So strong opinions voiced by organisations during the phase of negotiations on any scheme's details should be the rule rather than the exception. If this is true, legal and institutional barriers can be expected with certainty, and should not be treated as a 'surprising disappointment'.

30. Barriers related to *opposition from interest groups* relate to non-governmental actors and/or organisations with a perceived stake in the urban transport system, who deliberately oppose marginal cost-based policies and measures. Reasons for their opposition might include perceptions of:

- (i) insufficient communication regarding the objectives and potential benefits (and dangers) of marginal cost-based pricing policies;
- (ii) distributional issues regarding precisely who wins and who loses; and
- (iii) insufficient effort and resources to cater for and, perhaps, compensate those who might expect to be worse off as a result of marginal cost-based urban transport pricing policies.

4.4.3 Socio-political acceptability of marginal cost pricing

Socio-political acceptability is a critical precondition for the implementation of marginal cost pricing (cf. AFFORD Deliverable 2c). A common view is that the ultimate reason for new marginal cost-based pricing measures not appearing high on the political agenda is insufficient socio-political acceptability; if this problem could be solved, the relevant institutions would emerge and would co-operate and move rather quickly in implementation. Understanding the basic reasons for the low socio-political

acceptability may be a key to solving the implementation problem. Therefore, restricting the analysis to the legal and institutional barriers (as defined above, as structured barriers and interest groups against marginal cost pricing) only, without including the acceptability issues, would not be a very promising research strategy when the goal are practical policy conclusions.

31. A natural (implicit) assumption when considering the legal and institutional barriers to marginal cost pricing is that sufficient political support or socio-political acceptability exists (has been gained) already, and that the problem is to get it to lead to a real action – to the actual implementation. However, in many (most) cases in real life, this precondition is not satisfied: it is the *low socio-political acceptability* which is the real problem; moreover, this problem appears to be closely interlinked with the legal and institutional status quo.

32. Strong theoretical arguments suggest that non-governmental organisations acting to oppose marginal cost pricing policies are much more common than similar organisations acting for their support. This can be explained by the asymmetry between winners and losers due to marginal cost-based pricing policies: typically, the intensity of welfare changes for the losers is notably bigger than for the winners, suggesting that potential losers create organisations to oppose the policies more likely than potential gainers to support them.

Another important factor here is that, for local politicians in particular, considering wider institutional reforms is normally well beyond their work brief and rather tends to be something they oppose – also on the grounds that such changes typically are imposed from above by people who know little about the day-to-day demands of what they do. Also, they may tend to think that marginal cost pricing is impossible for them to consider because of insurmountable difficulties it would cause to the relationship between their organisation and others, and because the chaos caused by the change would outweigh the benefits.

A third important reason for low socio-political acceptability may be the fact that marginal cost pricing is not be universally accepted by all economists and by other relevant disciplines. Clearly, disagreement on the validity of the approach is likely to be a major barrier. Such a far-reaching concept would need almost unanimous support to be politically acceptable and widely implemented.

However, currently politicians, civil servants and other individuals representing the relevant organisations may not be familiar to or are not convinced by the principles of marginal social cost pricing. Many of them are specialists in areas other than economics and have an applied specialism in socio-political acceptance simply because they are involved in policy-making. Therefore, even though politicians and civil servants often are readier than the average citizen to accept or even endorse measures restricting the use of car, they may judge the suggestions (of academics) regarding marginal cost pricing against a completely different set of criteria than the theoretical efficiency objectives which it is based on.

However, a bigger reason for the policy-makers at the local level rather see road user charges either as a practical mechanism by which road travel demand may possibly be reduced or as a major source of revenue for investing in alternatives to the car is that these criteria (goals) are much more convincing at the local level politics than the general (abstract) goals of efficiency and fairness. (These goals are more relevant and convincing at the national and EU levels.) The primary objectives of local policy-makers are based on considerations of microscopic pragmatic goals – e.g. reduce traffic volumes and pollution levels on a small number of streets in the city centre – and of what is legally and politically feasible to achieve.

The agendas of politicians and transport professionals are typically set based on how they see their roles within the existing political and legal and institutional structures and systems. Their attitudes are likely to be extremely sensitive to perceptions of their own positions, and to the potential opportunities and threats they would be posed by change. In particular, the dependence of the socio-political acceptability on the legal and institutional status quo may partly be caused by individuals within the government organisations with a stake in preserving the existing organisational status quo. Politicians will typically respond to the interests of the people who vote for them; so, if they represent just part of the people affected by marginal cost pricing, they will consider the interests of those people more than of the population as a whole.

33. One important reason for low socio-political acceptability may be its potential dependence on the legal and institutional status quo. That is, while in many cases changing the legal and institutional structures/systems first might be the key to gaining the required socio-political acceptance, such a change does not appear likely without gaining the required acceptance first. This may partly explain why, in the minds of policy-makers, acceptability issues and institutional issues seem to get easily mixed. This study will pay specific attention to this issue, which the existing studies about socio-political acceptability of marginal cost pricing (or the studies focusing on the legal and institutional barriers) have not explicitly addressed.

34. In summary, the *low socio-political acceptability* is manifested in the behaviour of politicians and government organisations, and typically at the local level. It may reflect:

- (i) the fact that marginal cost pricing is not universally accepted by economists and other relevant academic disciplines;
- (ii) the fact that politicians and civil servants representing the relevant organisations are not familiar with or are not convinced by the principles of marginal cost pricing;
- (iii) tensions between the local and national levels of government;
- (iv) the need for local governments to justify their policies in terms of practical (pragmatic) and often detailed arguments rather than in terms of general arguments referring to efficiency and equity or fairness benefits which are the criteria emphasised in the context of marginal cost pricing;
- (v) the competition between different neighbouring local communities; and
- (vi) the interests of individuals working within government organisations with a stake in preserving the status quo.

5 Settings

Section 3 described the theoretical approach of the study on a general level, and section 4 provided a more detailed picture of the key issues and concepts/definitions. This section continues the illustration of the range of the key elements and themes of the study by considering separately each of the four settings – focusing on marginal cost pricing within road transport, considering marginal cost pricing for multi-modal transport, focusing on marginal cost pricing in a spatial and geographical context, and covering inter-sectoral aspects of marginal cost pricing. Within each setting, we consider: (i) the key marginal cost pricing issues; (ii) the organisations involved as prime actors; and (iii) the typical legal and institutional barriers.

The settings represent, as emphasised in section 4, different perspectives and levels and scopes of policy-making, which all are relevant to marginal cost pricing. Evidently, however, there is significant overlap and interaction between the different settings in relation to both the key issues, the organisations involved and the barriers. This raises the important question of the needs for and possibility of co-ordination.

Sections 5.1-5.4 discuss separately the four settings, and section 5.5 shortly discusses the co-ordination issues. The discussions are illustrative only. The aim of the empirical sections 6-8 later is to give a more comprehensive and realistic picture.

5.1 Focussing on marginal cost pricing within road transport

35. When *focussing on marginal cost pricing within road transport* (setting 1), the *key issues* are related to the practical ways of charging road users, and, in particular, with the aim to differentiate between different users according to their types or time of day. The *organisations involved as prime actors* are government agencies responsible for managing the urban road network. At one extreme, this could be a single homogeneous organisation; at the other, it could involve divisions of jurisdiction between local and national government, between neighbouring geographic localities and between different management functions, some of which may even be provided by the private sector.

Generally, the local government agencies involved will be directly accountable to elected politicians at the local level and will form part of an overall urban management framework. However, the situation in some cities may be more complex. In particular, for some medium-sized and smaller cities (e.g. Cambridge in the UK), the responsibility for managing urban transport may lie with a regional authority. In this case, there may be additional divisions of jurisdiction between the local and regional level, affecting issues of local political accountability and the co-ordination of transport with other related management functions (e.g. tourism).

In The Netherlands, there has been identified (Verhoef et al...) three governmental levels involved in the actual implementation of road pricing: the national, province and

city level. For a successful preparation and implementation of road pricing schemes, it is indispensable that such different government agencies co-operate and agree on both the goals of the policy and on politically important issues such as the question of which government body (and on which spatial level) will eventually receive the tax revenues, and decide on the allocation.

Other organisations which may be involved as significant actors in the introduction of marginal cost pricing for urban road transport are: the organisations responsible for policing urban road transport and for dealing with offenders (for enforcement purposes); and private financiers and technology hardware manufacturers (to facilitate the implementation of electronic charging technology). In addition, the range of interest groups, who would be affected by the conceptual implications of the policy and its practical implementation, might include: road haulage organisations; chambers of commerce; consumer groups representing the interests of road travellers (for all road-based modes); groups representing local residents; and representatives from industries with a direct financial stake in urban road travel (e.g. vehicle manufacturers, retailers and fuel providers).

In particular, unexpected institutions may become important for the overall feasibility of road pricing. One example is the indisputable importance of the press and mass media in the shaping of public attitudes. Personal opinions and perceptions of a few highly positioned individuals in the mass media industry, including leading journalists, may eventually 'make or break' the public acceptability of road pricing. The same holds for, for instance, consumers' organisations, employers' and employees' unions, etc. Even opinion leaders of different kinds may be decisive. A parallel can, for instance, be drawn with the case of a famous Dutch comedian, who alone is held responsible for the failure of an initially successful brand of alcohol-free beer in The Netherlands, after he made some denigrating remarks on this brand in general, and its consumers in particular, in a national television show.

36. The *relevant legal and institutional barriers* may affect the ability of marginal cost-based road pricing to differentiate between different types of users, and/or between users (similar or dissimilar) in time. Marginal cost-based road pricing, when implemented, must be compatible with the overall legal structure. One important reason why legal and institutional barriers may affect, or even prevent, the implementation of marginal cost road pricing, can be a potential conflict with national level laws and policies. Such laws, affecting the ability to charge marginal cost-based prices may e.g. be constitutional laws guaranteeing freedom of move (road tolls) or privacy (electronic road pricing). The relevant laws and policies may also be related to fiscal taxation.

For example, in The Netherlands, a practical legal problem is that the law somewhere states that the moment of paying a tax should not affect the level of the tax (which is to protect income tax payers from uncertainty concerning the total sum to be paid provided it is paid within the legal term). This is clearly at tension with the ideal of time-varying tolls in congestion pricing. Another illustration of the importance of legislative feasibility in The Netherlands concerns the car-pool lane between Amsterdam and Amersfoort, which, after a few months of operation in the early 90's, had to be made

available for everybody because Court decided that the concept of ‘car-pool lanes’ has no legal interpretation in The Netherlands (following a law-suit initiated by a previous Minister of Transport!).

5.2 Considering marginal cost pricing for multi-modal transport

37. When *considering marginal cost pricing for multi-modal transport* (setting 2), the *key issues* are related to (i) pricing within the urban public transport sector; and (ii) the integration of urban public transport pricing with approaches in the road transport sector. A critical issue which arises under both headings is the existence of, or potential for, public transport subsidy. Other important issues are setting consistent user charges across different modes including public transport (integrated multi-modal marginal cost-based pricing schemes), the internal organisation of public transport, and using the revenues optimally (cross-subsidies, earmarked revenue use) within the transport sector. In particular, related to the privatisation and deregulation, there is the theoretical issue of whether marginal cost pricing makes sense for public transport. For example, if it involves operating at a loss, there may be very big legal and institutional implications. Also, this is an area where potential conflicts between national and local policies may be an important issue. The *organisations involved as prime actors* are government agencies responsible for managing the urban multi-modal transport system.

Specifically, in an era of privatisation of public (collective) transport, marginal cost pricing in the associated modes may be hard to achieve as it may be *perceived* to run counter to the free-market arguments that motivated the move towards privatisation and deregulation in the first place. Such arguments would have little (if any) economic validity in the sense that there are no fundamental reasons to dispute the social benefits of marginal external cost taxes applied to privatised transit agencies as well. From a practical viewpoint, however, we observe that the use of such taxes may provide a further argument for the lump-sum subsidisation of losses insofar as resulting from economies of scale in transit.

In many cases the organisations involved may be the same as – or an extension of – the set of organisations responsible for managing urban road transport (within setting 1). There may be greater tendencies towards unity across urban regions within the multi-modal setting, due to natural city-wide requirements to co-ordinate effective public transport services for social welfare purposes.

Although it is certainly valid to draw a distinction between the ‘multi-modal setting’ and the ‘road setting’ from a policy perspective, as the range of relevant instruments and of policy packages is much narrower in the latter, it is, however, unlikely that they would differ greatly in practice regarding the organisations involved. In particular, a marginal cost pricing policy which covers only the road sector will, nevertheless, be expected to have major impacts at the multi-modal level. Therefore, it may well be that, where a division of management responsibility exists between government agencies for the road and multi-modal aspects of urban transport, the prime institution for addressing marginal cost pricing issues may tend to be the agency with the multi-modal role.

Other organisations which may be significant actors include: the government agencies responsible for managing urban public transport (to ensure that the city's wider economic and social travel needs are catered for); road-based emergency services; road-based public transport operators and taxi services; the organisations responsible for policing urban transport and for dealing with offenders, across all modes (for enforcement purposes); private financiers and technology hardware manufacturers (to facilitate the implementation of electronic charging technology); and local and national public transport operators whose services are used within the urban region. The additional set of interest groups affected by should be similar to that for setting 1, but possibly broadened to a multi-modal context.

A typical marginal cost-based pricing policy package, when covering multi-modal transport, is the *weak policy package* (as described in section 3.1 and originally defined in Deliverable 1).

38. The *relevant legal and institutional barriers* may restrict the ability to implement a comprehensive and integrated marginal cost-based pricing scheme. Is such a scheme, covering several modes, feasible – legally, institutionally and politically? Also, the relevant barriers may affect or prevent using earmarked revenues within the transportation sector. A third type of barrier is the influence of national level policies. For instance, if a national government follows a philosophy heavily influenced by the perceived benefits of privatisation and deregulation, it may put in place legal and institutional arrangements for some parts of the urban transport sector (e.g. public transport provision) which make it much more difficult for local government agencies to intervene in the market.

5.3 Focussing on marginal cost pricing in a spatial and geographical context

39. When *focussing on marginal cost pricing in a spatial and geographical context* (setting 3), the *key issues* are related to the differentiation between different users of the transport system spatially and geographically, to allowing for longer term land-use effects, and to competition and/or co-ordination between neighbouring localities within the relevant urban region on issues related to economic development and land use. The *organisations involved as prime actors* may comprise a partnership of government agencies responsible for multi-modal transport across the urban region and those responsible for the urban economy and land use planning and development policy. As these are, typically, completely separate functions within the local urban management framework, effective co-ordination for practical decision-making could be difficult to achieve, although it should be by no means impossible where all functions are ultimately accountable to the same elected political representatives.

Spatial and geographical aspects of marginal cost pricing refer to the ability to differentiate by means of pricing across space – by means of area licences, peak permits,

etc. Car parking pricing has an extremely strong spatial and geographic dimension. Furthermore, in the longer run, land use impacts or development and location subsidies/taxes as related pricing measures are issues with strong spatial or geographic dimension.

40. The *relevant legal and institutional barriers* that may limit the ability of marginal cost-based pricing to differentiate across space or geographically are related to ‘distortions in other routes’ and to the ability to differentiate between different types of roads. Especially important barriers may be related to co-operation between communities within a large conurbation, which is primarily an institutional issue (i.e. different geographic areas, road types etc. fall under different organisations).

5.4 Covering inter-sectoral aspects of marginal cost pricing

41. When *covering inter-sectoral aspects of marginal cost pricing* (setting 4), the *key issues* (i) impacts on the base of fiscal taxation; (ii) inter-sectoral revenue transfers without hypothecation (e.g. to lower labour taxes); and (iii) the question of whether similar marginal cost-based pricing principles are applied in other related sectors (with potential implications for the efficiency of resource allocation between sectors). A further technical issue is the determination of the shadow price of public funds. The *organisations involved as prime actors* include the ministry of finance. When distributing the revenues through inter-sectoral transfers, the prime actor role moves from local to national level, as only those government agencies with an overview of all sectors of the economy would appropriately take on the role.

Car ownership taxes and fuel taxes, in particular, are normally based on fiscal principles: the revenues go directly to state budget or general national governmental funds, and they are used for covering various types of national needs. Adjusting these taxes so as to reflect marginal cost pricing principle would necessarily affect fiscal taxation, and would have important legal and institutional implications.

A typical marginal cost-based pricing policy package, covering inter-sectoral distortions, is the *strong policy package* (as described in section 3.1 and originally introduced in Deliverable 1).

42. The *relevant legal and institutional barriers* are related to the ability to use revenues in an efficient (optimal) way. Are there legal and institutional barriers affecting the use of revenues? In particular, are there such barriers to using the revenues to lower distortionary labour taxes?

5.5 Co-ordination issues

The sections 5.1-5.4 above discussed the key issues, the major organisations, and the legal and institutional barriers relevant within the different settings. The aim was to

identify the essential elements affecting the implementation of marginal cost pricing at the different policy-making levels. The need for co-ordination of decisions at the different policy-making levels was brought up in many places.

Although there are laws to say which organisations control which part of the transport (pricing) system, they typically do not necessarily prevent them from working together (unless they are designed to result in competition). So the difficulties of organisations working together (co-operating) to a common goal may be the key here.

43. Important reasons for the need for co-ordination of decisions at the different policy-making levels – represented by settings 1-4 – include:

- (i) the marginal cost pricing measures, typically implemented at the local level, may be in contradiction with (more general) national level policies and laws;
- (ii) strategic behaviour of key organisations may cause confrontations – in the form of, for example, policy and tax competition between different government levels; and
- (iii) the marginal cost-based pricing policy packages typically cover both the charging and the revenue use side (e.g. the weak and the strong package above).

Unless it is possible to levy appropriate marginal cost-based charges through a pricing mechanism which can be implemented and administered fully by national institutions (such as fuel taxes), it would be necessary to achieve effective co-ordination between national and local government agencies. Given that these agencies are normally accountable to a completely different set of elected political representatives with, potentially, quite different priorities and ideologies, this may be difficult to achieve.

An important factor affecting the need for co-ordination is the nature of how people live, work and travel. People have become more diverse in their activities and they commute further. They are covered by a large spread of organisations: they may live in one local authority, commute through another to get to work in a third. They also may use a mixture of national and local maintained transport services. This affects the questions who do they pay the marginal cost of their trips to and how the money is redistributed.

The co-ordination problems are given particular attention when addressing practical situations in the case cities (sections 6-8 below). These problems are addressed further when discussing the needs and prospects for institutional reform (section 9).

6 Empirical analysis – preliminary considerations

The strategy of this study has been to achieve the greatest level of integration between the theoretical principles of analysing legal and institutional issues relevant to marginal cost pricing and the wide range of practical considerations – often very detailed – on which real-world policy decisions largely depend. Sections 2-5 above presented the theoretical framework and the basic concepts, definitions and issues.

This section lays down the basis of the empirical analysis. In particular, we describe the nature of the empirical approach and present some background information and preliminary considerations regarding the importance of legal and institutional barriers affecting different pricing measures.

44. In order to carry out a comprehensive and sufficiently detailed empirical analysis, this study has undertaken:

- (I) a review of the prevailing legal and institutional situation in the member states of the European Union and beyond;
- (II) case study reports of the prevailing legal and institutional frameworks and barriers affecting urban transport pricing for five case study locations (Athens, Edinburgh, Helsinki, Lombardy and Madrid); and
- (III) a questionnaire and related in-depth discussions involving transport professionals and politicians within the case studies.

In addition, the authors have gained access to first-hand information concerning the situation and experiences in The Netherlands (a full document is in annex xx).

Section 6.1 summarises the questions and conclusions of the general review. Section 6.2 does the same for the specific case studies consulted during the study. Section 6.3 outlines the design of the questionnaire, and section 6.4 provides preliminary considerations on the relative importance of barriers to different pricing measures.

6.1 Review of the prevailing legal and institutional situation

45. The overall goal of the review of the *prevailing legal and institutional situation* has been to identify frameworks (structures, systems) and barriers relevant to the implementation of marginal cost-based pricing and to provide an overall view of the complexities involved. More specifically, the review:

- (i) concludes on the degree and importance of inter-country differences of existing legal and institutional frameworks;
- (ii) distinguishes relevant (i.e. critical to marginal cost pricing) information on the prevailing legal and institutional frameworks from information which is ‘nice to know’ but less relevant; and
- (iii) presents tentative conclusions providing reference information for the case study analyses but also direct information to the overall findings of the study.

46. Regarding the *degree and importance of the inter-country differences of existing legal and institutional frameworks*, to the analysis and policy conclusions, different views seem to exist. It is sometimes stated that there are such large differences between different countries that the ability to use standard theories and formal models let alone quantitative analysis to draw general conclusions about their impacts on issues such as transport pricing policy is rather constrained. However, the views emphasising the importance of these differences seem to reflect a lack of sound theoretical approach or framework and a tendency to focus too heavily at a detailed level. Our view is that, at a more general level, the similarities between countries (and, in particular, EU member states) far outweigh the differences.

47. The *relevant information on the prevailing legal and institutional frameworks* can be distinguished from less relevant only based on good understanding of the nature of questions to be asked and the methods and models to be used. For example, while the foundational aspects of the constitutional framework can vary from country to country, from very central-oriented to federal, across EU member states, these divergences should not necessarily prevent the achievement of transferable results, either qualitative or quantitative. Rather, they can act as a driving force within a formal model for generating different results.

While some coverage of the general legal and institutional frameworks for administration of transport in urban areas (covering planning, finance, construction and maintenance) is unavoidable, the review has constrained its scope as far as possible to issues directly relevant to marginal cost pricing, to avoid the key ideas becoming lost in the midst of extraneous practical details. The summary contained in this section takes a broad stance, considering the general situation in member states of the European Union and beyond. The full text of the review is presented in Annex x [**add*]

For example, some countries, such as Portugal (or even France?), do not have any regional organisation, others are primarily of a federal nature (notably Germany), while others fall somewhere between (Spain, Italy).

48. Distilling *tentative conclusions* is affected by the problem that transport pricing policy issues have not previously been investigated systematically in a legal and institutional context. There is a very limited availability of other relevant work to provide reference information and facilitate the analysis at anything other than a very general level.

49. The review suggests two broad groups of administrative models across the EU:

- (1) a model of two administrative levels – local and national; and
- (2) a model of three or more administrative levels – local, national and intermediate (usually regional) levels.

The former model tends to be common in smaller countries with fewer than 15 million inhabitants, while the latter is most common in larger countries. This is a natural function of human and geographical scale: in some cases the population and/or spatial area of a region within a large country may be similar to that of a smaller nation. The significance of this issue to transport pricing policy is, quite simply, that the number of

administrative levels which need to be involved in formulating and implementing policy will affect the logistical complexity of achieving policy goals. It might be reasonable to expect that the greater the number of administrative levels the greater the legal and institutional complexity (and associated barriers) will prove to be.

It is, perhaps, no coincidence that the longest-standing example of a successful urban road pricing system is in Singapore, a single city state with, in effect, a single administrative level for deciding and implementing transport policy.

The UK might be considered as an exception to the typical European scenario outlined above, because it is a member state with a large population but a tendency to have only two administrative levels (local and national) covering most major towns and cities. This has come about as part of a piecemeal solution to local and regional government, after a quarter of a century of experimentation with different structures. The creation of regional municipalities covering the largest cities and urban conurbations during the 1970s was later reversed, because the political disbenefits of powerful bodies that often pursued policies very different to those advocated by national government was perceived (by national politicians) to outweigh the obvious practical benefits of regional integration and co-ordination.

In addition, many of the larger EU member states (including Spain and Italy) are currently showing a trend towards greater devolution, with the aim of providing regional administrations with increased responsibility (and, perhaps, power). Consistent with this is the creation of new intermediate parliaments for Scotland and Wales in the UK. A further devolutionary trend can be observed towards strengthening the local level by means of an aggregation of local institutions. This has been the case in Germany, where a new administrative level (Kreis) has been created between the Land and the Municipality. In most countries which fit into group 2, as defined above, the regions have some degree of power covering local institutions. Sometimes this reflects the legal framework at Constitutional level, but it is not infrequent to find cases where this occurs primarily due to a pragmatic consensus.

In transportation, a general feature is that responsibilities and powers tend to be shared between different administrative levels and are not always treated in a comparable manner in different parts of the transport sector. For example, responsibility and power in the railway sector is, usually, primarily at the national level, while that for roads tends to be divided between levels based on road type.

One particular issue related to situations where institutional structures are evolving – especially in a direction of greater decentralisation – is that this can affect the clarity of definition of responsibilities and powers towards particular functions, such as transport. Where a particular level of administration is being strengthened primarily to provide more coherent and integrated policy guidance for an area, this may be expected to assist clarity; but, where other, more idealistic political objectives are the driving force for change, it may take time for the disruption caused by changes of role to be resolved.

6.2 Case study reports

50. The *case study reports* provide a detailed description of prevailing legal and institutional structures/systems for the five case study environments (Athens, Edinburgh, Helsinki, Lombardy and Madrid). These reports describe the existing transportation systems and transport pricing approaches for the urban areas concerned (focussing on legal and institutional aspects) and consider the potential barriers that legal and institutional frameworks (structures/systems) might present for marginal cost-based urban transport pricing.

The goal of the case study reports has been to gather general background information. The purpose has not been to go into too great detail about the prevailing legal and institutional situations. What has driven this part of the work is not a description of what is there but, rather, an identification of a set of critical issues which need to be considered from marginal cost pricing viewpoint.

This section summarises the main observations from the case study reports. (The full reports are presented in Annexes xx-xx [**to add*].) Sections 7 and 8 below will develop these ideas further, with particular reference to the completion and findings of the case study questionnaires.

With respect to transport pricing, the case study reports addressed the following issues:

- (i) the existence of any *road or congestion tolls* (manned or automatic) or of any *area access permits* within the case study area and the legal and institutional basis for them: the potential for implementing such measures as part of marginal cost-based transport pricing;
- (ii) approaches to *parking pricing*, identifying the different types of parking available (e.g. on-street or off-street, privately-owned or municipal lease), the spatial and temporal criteria used to define both areas within which parking is controlled and the fees levied, the legal and institutional arrangements for dealing with parking issues (control policies, enforcement etc) and the uses of revenue;
- (iii) approaches to *public transport fares and subsidies*, describing the source and level of any subsidies, the structure of public transport fares, the criteria for redistributing revenues and the related legal and institutional aspects;
- (iv) identification of any relevant pricing issues related to general *car ownership and use*, considering the legal and institutional arrangements for defining, implementing and enforcing car ownership related taxes and issues of how revenue is used: in particular, the potential to differentiate such taxes by vehicle type, engine capacity and vehicle usage (e.g. in terms of distance travelled) was noted; and
- (v) approaches to *fuel taxation*, considering the percentage of the total fuel price which is due to taxation, the mechanism by which this is determined, the institutional arrangements for implementation and enforcement and the issue of how revenues are used.

With respect to more general legal and institutional aspects, the case study reports addressed:

- (i) the structures and roles of organisations or institutions involved in the *road transport* sector, considering responsibilities for planning, finance and construction, traffic management and maintenance, as well as possible formal agreements between them and supra-institutional authorities acting as ‘referees’;
- (ii) the structures and roles of organisations/institutions with responsibility for *parking* provision, control and management, in particular the existence of powers to place limitations on the use and construction of private parking;
- (iii) the structures and roles of organisations/institutions related to *public transport*, considering responsibilities for planning, finance, construction, management, operation and maintenance, taking account of contractual agreements between the public and private sector, financing frameworks, powers to implement special tariff agreements (e.g. ticketing arrangements to encourage public transport use, promote integration and meet social mobility objectives); and
- (iv) identification of any relevant legal and institutional issues related to general *fiscal policy* which may affect the adoption of marginal cost-based pricing for urban transport, considering in particular the structures and roles of organisations/institutions responsible for defining taxation policy (at the local, regional and national levels), the possibilities for modifying the policy and issues of how revenues may be re-distributed between levels of government.

51. The reports show that the urban areas chosen by the AFFORD study represent a broad sample of situations in the European context. In particular, the following important dimensions emerge:

- (i) the number of administrative levels (two for Athens, Edinburgh and Helsinki, three for Lombardy and Madrid);
- (ii) the balance of responsibility between the public and private sectors (e.g. the market-oriented approach to public transport provision in Edinburgh, compared to much more interventionist policies in Helsinki and Madrid); and
- (iii) the level of stability of the prevailing legal and institutional frameworks or structures/systems (e.g. the long-standing and stable arrangements in Athens and Helsinki, compared to the evolving legal approaches to transport pricing and the recent and related creation of a new national institution in Edinburgh).

6.3 Questionnaire

52. In addition to the case study reports, data collection within the five case studies was carried out by means of a *questionnaire* posed to local politicians and planners, focussing on the legal and institutional issues related to urban transport pricing. This, supported by in-depth discussions, has helped to clarify the perceived implications of issues raised by the background reports and has enabled a greater focus on the potential for change to urban transport pricing policy.

The questionnaire is presented in full in Annex x [**to add*].

53. The questionnaire was sub-divided into two parts, the first part focussing on a range of individual measures that may be appropriate for a marginal cost pricing approach and the second part on certain pre-determined specific pricing policy packages. In particular, building on the results of AFFORD Deliverable 1, the questionnaire included two marginal cost-based policy packages: a *weak or acceptable package* and a *strong or best practice second-best package*.

Following from Deliverable 1, the individual marginal cost-based pricing measures included in the questionnaire and commented on by the interviewees during the discussions were:

- electronic road pricing per km;
- parking fees;
- toll booths;
- electronic road pricing cordons;
- peak permits;
- area licences;
- fuel taxes;
- vehicle taxes;
- subsidised public transport / public transport fares;
- subsidised tele-working;
- location taxes and subsidies.

The weak package assumes relatively low charges and earmarked revenue use. In particular, it states that:

- *parking charges are increased by 0.25 euro/hour, with a fixed tariff of 1 euro plus taxes on fuel increased by 0.1 euro/litre, while the revenues allocated as follows: 1/3 to increase road capacity and/or increase parking space, 1/3 to reduce car taxes, and 1/3 to reduce public transport tariffs and/or provide more facilities to cyclists and pedestrians.*

The strong package assumes relatively high charges and that much of the revenues are used to lower labour taxes (i.e. without earmarking). In particular, it states that:

- *parking charges are increased by 0.5 euro/hour, taxes on fuel are increased by 0.5 euro/litre and a cordon toll of 2 euro in peak hour (7:00 to 9:00 a.m.) and 0.5 euro/hour out of this period, whereas the revenues are allocated as follows: 1/3 to increase road capacity and 2/3 to reduce labour taxes.*

When considering the key legal and institutional issues and barriers related to the implementation of these packages, a particularly important question concerns barriers to co-ordination between the organisations which would need to be involved.

54. The questionnaire was pre-tested in Madrid. The pre-test confirmed the validity of the approach but also showed that, in the interviewees' minds, legal and institutional issues are entangled to those of acceptability. In fact, it was clear that the politicians, planners and managers interviewed tend to think of core issues and barriers in terms of socio-political acceptability rather than in terms of legal and institutional feasibility.

This cannot be considered too surprising, because most legal and institutional barriers could potentially be removed at national level if sufficient socio-political acceptability exists.

Following this observation, it was considered inappropriate (and, potentially, even counterproductive) to focus on very general and rather abstract and theoretical issues in the questionnaire, under such headings as “general barriers to the concepts of marginal cost pricing”.

55. The pre-test also showed that politicians and planners find it difficult to conceive comprehensive marginal cost-based packages for urban transport pricing, as a result of the prevailing legal and institutional structures/systems and the problems that attempting to change them seem to imply. Therefore, it was, in general, not possible to attempt to define packages of this nature, customised to the requirements of each case study location. As a result, the focus of the questionnaire tended towards greater emphasis on the uni-modal road transport setting and on the individual marginal cost-based pricing measures than was originally expected.

6.4 Relative importance of barriers to different measures

56. In order to get further information on the interviewees’ perceptions of the key problems, the questionnaire introduced a system for scoring individual measures. Each interviewee was given a total of 100 points, which he/she was asked to allocate to a set of pre-defined measures, in the order of relative importance of the barriers associated with the different measures (insignificant was equal to 0). This survey was devised only as a general guide and was not intended to be analysed statistically, because the size of the sample was extremely small and could not be guaranteed to represent all relevant views.

57. This approach was not as successful as wished, due to the lack of participation of interviewees for some of the case studies. Evidently the scoring approach did not fit easily with the perceptions of barriers in some locations and was considered too abstract to be useful. The experience suggests that it may not be an easy task to find a simple comparison mechanism for such a range of different issues, with very different legal and institutional aspects.

- In Athens, Lombardy and Madrid, the interviewees followed the proposed scoring scheme (in Lombardy, based on a sample size of one, in Athens and Madrid, based on the average of several answers) to produce the results depicted in Figure 6.4.1.
- In Edinburgh, the local perspective was that the scoring scheme did not easily reflect the barriers perceived. Barriers to changing fuel and vehicle taxation levels for urban transport pricing purposes were considered absolute from the viewpoint of local decision-makers, as was any redistribution measure which assumes the use of charging revenue outside the local transport sector, at least during the first ten or twenty years of the scheme. The various measures for charging road users (and parking fees for private office spaces) are likely to be completely possible (i.e. scoring 0) in legal terms, assuming proposed national legislation on this issue is implemented successfully. Until this has been put in place, it is difficult to make a judgement as to the precise institutional and organisational issues.

- In Helsinki, the relative importance of the barriers was impossible to assess – even from a strategic point of view. The current political climate does not seem to admit the benefits of marginal cost pricing even in principle, and is also hostile to any new forms of road tolling. The general view expressed was that, if a system were politically acceptable, all (institutional and legal) problems would be solved within a five year period. (An example of this was the proposed -- and politically rejected -- toll system in 1993, with a planned five year period of technical implementation.)

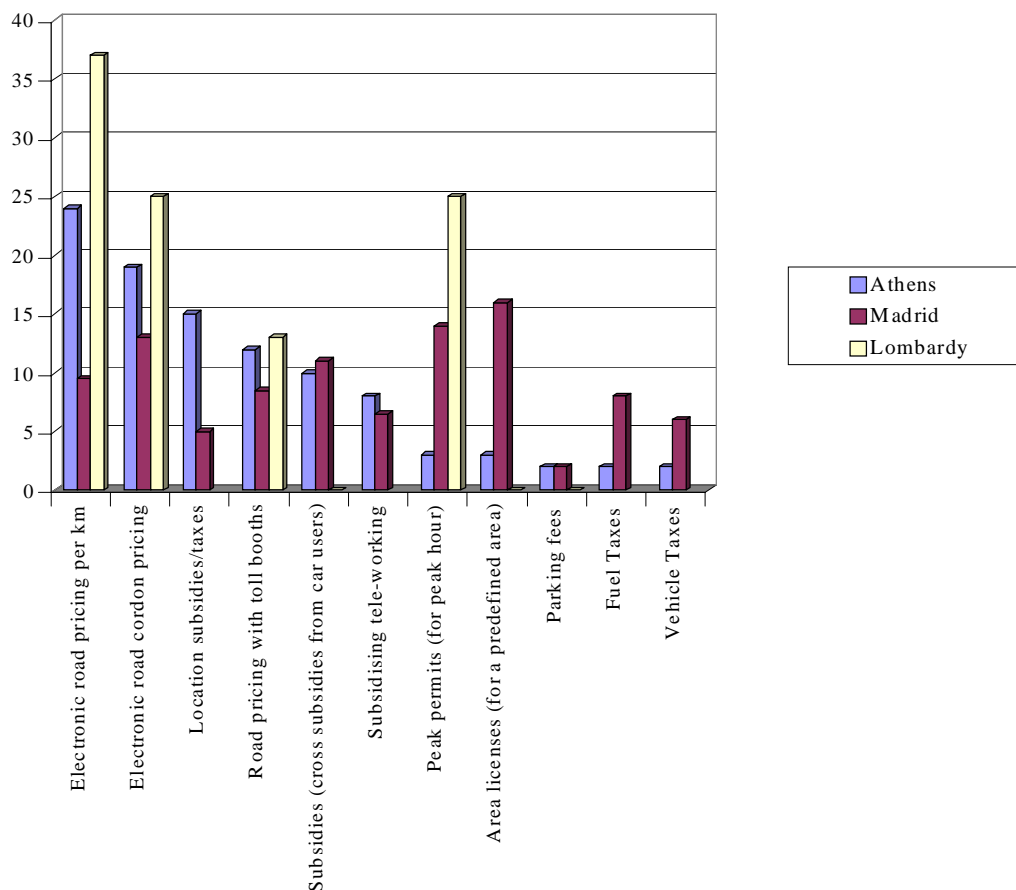


Figure 6.4.1: PERCEIVED DIFFICULTIES WITH INDIVIDUAL MEASURES IN MADRID, LOMBARDY AND ATHENS. (UNWEIGHTED AVERAGE; MAXIMUM TOTAL = 100).

The values produced in Athens, Lombardy and Madrid show that the marginal cost-based pricing measures may, perhaps, be categorised as follows:

1. measures with low barriers
 - parking fees
 - vehicle taxes
 - subsidised tele-working
2. measures with intermediate barriers
 - subsidised public transport / public transport fares
 - toll booths
 - location taxes and subsidies
3. measures with high barriers
 - electronic road pricing cordons

- electronic road pricing per km
4. measures with variable barriers
- fuel taxes
 - area licenses
 - peak permits

In general, those measures with lower barriers tend to be related either to charging approaches which already exist – albeit at levels not designed to reflect marginal costs – or to policies with a purely positive outcome for travellers (i.e. focussing on the ‘carrot’ rather than the ‘stick’). On the other hand, the highest barriers tend to be found related to policies for which there is no existing precedent and which might be expected to have the greatest impacts on travellers.

Of particular interest are those policies where the barriers are perceived to be variable. Area licenses and peak permits are found to have particularly low barriers in Athens, a fact which may be due to the fact that there is already a precedent for restricting access on traffic and environmental grounds. The barriers to these measures are much higher in Madrid and Lombardy, where no such precedent exists.

In contrast, the perceived barriers to electronic road pricing per kilometre (which generally has the highest barriers of all the measures) are significantly lower in Madrid. The reasons for this are not immediately apparent.

The tendency towards lower barriers for vehicle and fuel taxes is also interesting, because, while these are measures for which a clear precedent exists, they are normally controlled at national level and may, therefore, be difficult to use as part of a local or regional marginal cost pricing scheme for urban transport. One significant point here is that the two cities (xx) which provided data for these measures both have capital status and the decision-makers (and policy-makers) may, as a result, perceive greater influence over national policy. Certainly, decision-makers in Edinburgh indicated informally that they perceive very high barriers to the use of national taxation measures for urban transport pricing purposes.

A final observation is that, for those measures where data exists, the perception of barriers by decision-makers in Lombardy was higher than for both the other case studies reported in the pilot. This may tell us something genuinely interesting related to the comparative perceptions. On the other hand, it should make us aware of the limitations of the small and rather arbitrary samples consulted. From this point of view, the analysis carried out in Madrid may be most valuable, as it was used as a pre-test location for the questionnaire as well as a case study. Figure 6.4.2 provides greater detail for the Madrid case, showing both the final average scores and the range of values from individual respondents.

It is immediately apparent that, although variability tends to be symmetrical about the mean, the range of individual scores is dispersed quite widely. Therefore, it may be too simplistic to rely entirely on mean values. It may be that the most important issues are

the differences that exist between individuals and organisations/institutions involved in the same case study.

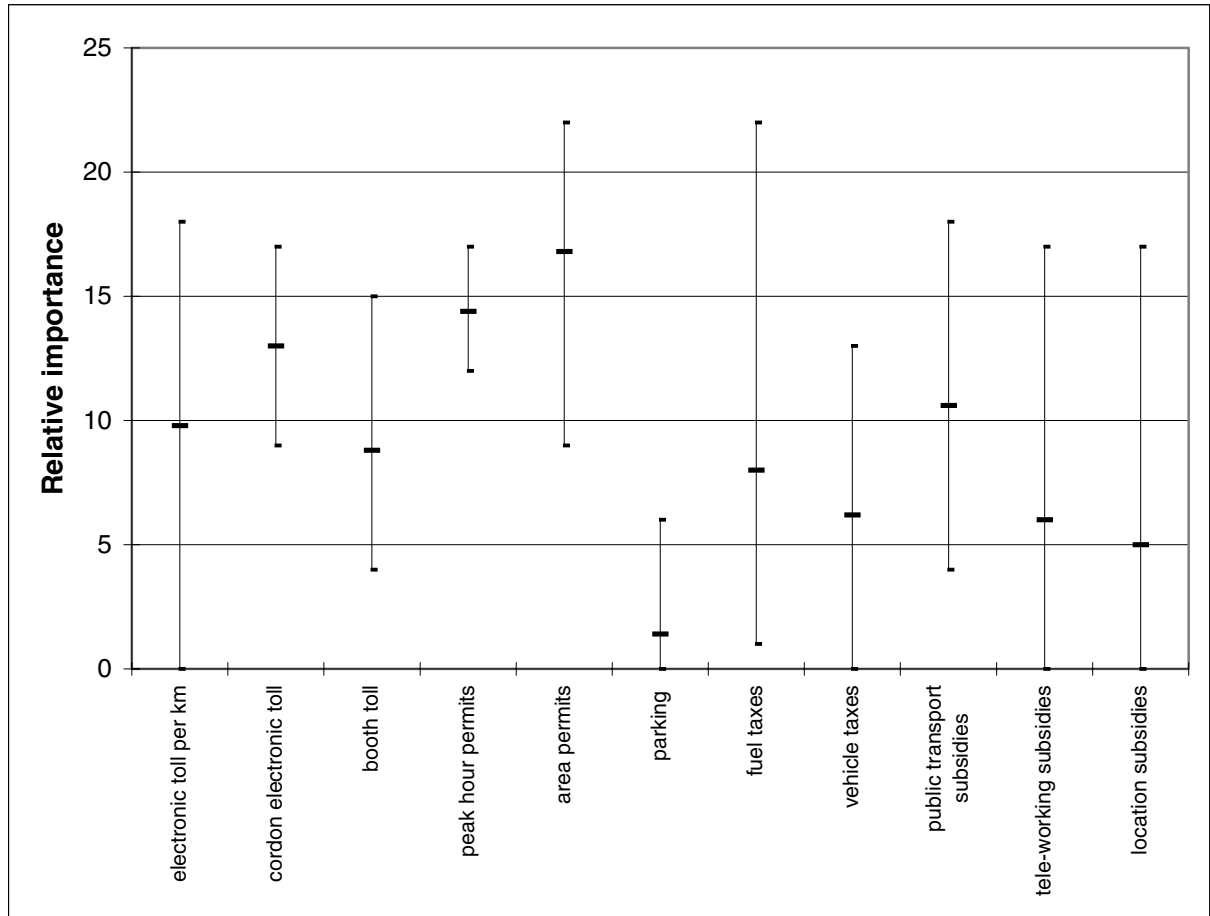


Figure 6.4.2: PERCEIVED DIFFICULTIES TO INDIVIDUAL MEASURES (UNWEIGHTED AVERAGE; MAXIMUM TOTAL = 100).

7 Legal and institutional barriers to marginal cost pricing – review of prevailing structures

Section 5 considered critical aspects of marginal cost pricing in relation to legal and institutional issues. The theoretical analysis reflected the framework described in section 4, in particular, the issues were considered separately within the four settings used throughout the AFFORD study, representing different decision-making situations in practice: (i) focussing on marginal cost pricing within road transport, (ii) considering marginal cost pricing for multi-modal transport, (iii) focussing on marginal cost pricing in a spatial and geographical context and (iv) covering inter-sectoral aspects of marginal cost pricing. The aim was to provide a comprehensive picture and, at the same time, to use practical examples to highlight a small number of key ideas. Section 6 subsequently described data collection undertaken during the AFFORD study and presented general background information and also some tentative conclusions.

58. This section analyses the legal and institutional frameworks, structures and barriers in more depth, identifying and assessing them further, in the light of the empirical data. Following the conceptual format adopted, these issues are again considered separately within the four settings adopted above.

Sections 7.1-7.4 discuss the legal and institutional issues relevant to the implementation of marginal cost-based pricing measures within these four settings, respectively. Each section follows the same format, beginning with an *overall review* before focusing on specific issues raised in the *case studies* and finally providing a synthesis through *summary and conclusions*. Section 7.5 provides an overall synthesis of the information from the case studies.

7.1 Focussing on marginal cost pricing within road transport

Overall review

Road pricing in urban areas is very rare, both in Europe and worldwide. The urban toll ring systems in three Norwegian cities (Oslo, Bergen and Trondheim) are the only long-standing European examples which have been reported extensively. However, these cannot be considered as examples of marginal cost-based pricing for urban transport, as their explicit primary purpose to date has always been to collect revenue to fund specific transport projects. Only the system in (the somewhat unique political and geographical setting of) Singapore can claim to have been used primarily to affect road travel patterns.

On the other hand, road pricing is much more common for inter-urban roads. Examples exist for quite a wide range of locations and pricing approaches. For example, in Europe, there are well established toll motorways in certain parts of Spain, Greece, France and Italy. In the case of Italy, toll motorways form the backbone of the interurban road network. Also, in the UK and elsewhere, there is a long-standing precedent of

levying charges for using major tunnels and bridges (e.g. The Dartford tunnel, which forms part of the M25 orbital motorway around London). However, yet again, the primary purpose is always to collect revenue towards maintenance and construction costs, rather than to manage traffic levels and/or reflect marginal costs. Furthermore, in most countries, the examples of inter-urban road pricing that exist tend to cover only a small proportion of the total inter-urban road network available to drivers, albeit focusing on the most heavily trafficked roads.

59. In general, the legal and institutional frameworks and structures required to implement marginal cost-based pricing for road transport in Europe (and beyond) have, so far, not been put in place. Even less has their potential for promoting efficiency been tested. This is particularly the case for urban road travel. Even those countries which have long-standing and accepted legal and institutional provisions for road pricing systems related to inter-urban motorway use may face a new and different set of problems when considering road pricing in the urban context.

One important contributory factor are the divisions of responsibility for providing transport services and managing their use between different organisations/institutions (in particular, different hierarchical levels of government). So, important barriers exist in the short-run related to the timescales and political uncertainties which would be associated with putting the necessary legal and institutional provisions in place and with changing the existing institutional culture regarding road transport pricing.

The existing legal and institutional structures may make it unreasonable to expect local and/or regional government authorities to take the lead in pursuing transport policies which may: (i) place them at a perceived competitive disadvantage (if only initially) to rivals who continue with existing policies; and (ii) require them to be motivated by goals beyond the immediate local / regional context (e.g. global warming).

60. The primary policy-making responsibility for most urban roads lies at the local or regional level, depending on the relative levels of power and the division of responsibilities between local and regional government. Looking after the transport system is a practical function which operates in parallel (but, often, subordinate) to managing the local and/or regional economy and providing for the general economic, social, environmental, health and educational needs of the resident population. Therefore, the emphasis of transport policy is very much on providing a service which facilitates other important lifestyle activities and all policy has an inevitable competitive angle with respect to neighbouring localities/regions. 60. This has, traditionally, tended to encourage policies promoting maximum mobility in pursuit of short-term economic growth and perceived social welfare. Only quite recently have concerns about the potentially damaging economic and environmental impacts of road traffic growth begun to challenge the predominance of other objectives in the local/regional policy-making context, usually as the result of quite severe problems affecting the more general local/regional policy goals which are perceived to be unacceptable.

In contrast, the policy-making responsibility for most inter-urban roads lies at the national level. Although similar issues arise of transport being considered subordinate to

other goals, the emphasis tends to be more on longer-run strategic management, providing rather more scope for ideological policy-making taking on board global perspectives. However, the impacts of any policy on immediate national economic prosperity is still the key objective against which national governments tend to be judged by their electorate and media, making competition with neighbouring countries an inevitable constraint on the policies pursued. Therefore, it may be the case that even national governments are rather better at representing the desires of their people for short-term economic prosperity than for long-term sustainability.

At the EU level, transport policy-making is addressed under the area of "Safety and Environment" and is, in general, free to be guided primarily by ideology and to take account of long-run issues and global perspectives. As a result... [*The green paper, The high level groups, White paper, "Three stage approach" recommendation by the Commission...] On the other hand, policy-making at the Europe-wide level may provide a greater opportunity for effective and powerful opposition from pressure groups (e.g. the road lobby, including international road hauliers) than exists at lower levels of government where the issues are more dispersed and pragmatic.

Although national transport ministers have approved the principle that pricing for urban transport should reflect the external costs generated at the EU level, they have, to date, been unwilling to pursue this in practice nationally and did not respond to the White Paper until the end of 1999. A major issue may be the uncertainties that currently exist between member states regarding general economic competition and harmonisation. ["The pilot projects in Finland and Sweden have been launched (and elsewhere?), High interest in the Parliament and its call on "integrated approach", High interest of the Transport Commissioner in pricing."]

In recent years, the EU has passed a number of directives designed to set guidelines for transport pricing. Examples include the specification of maximum rates for road haulage charges or the specification of toll fees [*what sort of toll fees? We need to be specific to avoid ambiguity. Also, doesn't the EU set limits on levels of fuel duty? If so, shouldn't this be mentioned too]. In particular, the Euro-Vignette directive, approved by the Council of Ministers in 1993, included explicit references to permitting local authorities to introduce road user charges, specifically designed to tackle traffic congestion. Although not motivated by marginal cost pricing principles, this action was intended to complement the internal market for road transport. It included specifying both minimum and maximum charges to be levied for motorways (or the equivalent highest category of roads), bridges, tunnels and mountain passes. It also stated that charges must be related to the costs of constructing, operating and developing the infrastructure networks and, although variation in charges based on time of day was included, there was no reference to sensitive routes or external costs. This directive was initially annulled by the European Court of Justice. A revised version issued subsequently included variations in charges based on the environmental characteristics of different vehicle types and was formally adopted in June 1999. However, the practical application of this directive ultimately depends on the actions of national governments and, in its present form, only applies to the small subset of road types specified where some form of road user charging already exists. Its main significance

from the viewpoint of studying legal and institutional issues related to marginal cost pricing for urban transport is the fact that, during the adoption process, the European Parliament was tempted to move in the direction of charging based on the perceived environmental damage caused by road transport. [*This last sentence seems to conflict with my understanding of what goes before a bit. Does it mean that the variations by environmental characteristics of vehicles were considered but not part of the final solution? ‘The problems with the Alpine transport among others made the process too difficult to amend the Directive as the Parliament wanted to have it in force sooner rather than later.’]

At national level, only the current UK and Italian governments are actively committed to creating legal and institutional frameworks that encourage road pricing for demand management purposes in urban areas [correct?]. However, even here, there are many issues that remain unresolved and large-scale field trials to test, among other things, the legal and institutional feasibility are still considered to be a number of years away.

Case studies

The following text reports the findings of the case study reports and questionnaires, by case study location, under four headings: (i) prevailing legal and institutional frameworks in urban road transport, (ii) prevailing framework for urban road transport pricing, (iii) relationships between the key organisations/institutions and (iv) barriers to marginal cost-based pricing.

[*one thing that concerns in general in this report is the mixture of terminology. In the UK they talk of ‘national, regional & local authorities’, but elsewhere there seems an implicit assumption that ‘Ministry’ or ‘Minister’ implies national authority & ‘municipalities’ are the local urban authorities. Include a short section early on which discusses this terminology & what it implies!]

Athens:

(i) *prevailing legal and institutional frameworks in urban road transport.* The national Ministry of the Environment, Planning and Public Works (YPEXODE) is responsible for the planning, finance, construction and maintenance of all roads. The municipalities and the Prefecture usually recommend and press YPEXODE for realisation of road construction and maintenance projects. The municipalities and the Prefecture also have the right to plan, finance, and manage small road projects. YPEXODE is responsible for traffic control and management in the Athens Metro Area. However, the municipalities and the Prefecture provide substantial feedback information for the evaluation and improvement of the traffic control and management system.

(ii) *prevailing framework for urban road transport pricing.* [*no info in main report]

(iii) *relationships between the key organisations/institutions.* The area within the existing Athens outer ring falls under the jurisdiction of a number of local municipalities, rather than a single, cohesive government unit. [*need to add more on other institutions]

(iv) *barriers to marginal cost-based pricing.* The introduction of direct charges for the use of pre-existing roads is not feasible under current legislation and, therefore, significant changes would be required at national level, including changes to the detailed Traffic Code. However, a precedent has been set for legislation to facilitate the construction of new roads as toll roads, co-funded by private sector capital under a BOT (Build, Operate and Transfer) agreement, related to a proposed major expressway around Greater Athens. According to the concession agreement approved by the Parliament, the concessionaire company (Attiki Odos) is responsible for the implementation of an automatic tolling system alongside standard manual toll collection.

Therefore, many of the legal and institutional issues relating to road pricing technology are being addressed. The power to set up such agreements is at national level and, if future toll roads were to be introduced, the current model suggests that each scheme would require separate, dedicated legislation. A major problem with extending the toll road concept to the general, pre-existing road network would be the inevitable increase that would be implied in the number of institutions that would need to be involved. New major roads built under BOT agreements may be considered as largely self-contained units a little separate to the general road network, the operators of which are directly accountable to the national government body that appointed them, rather than requiring close co-operation with all the local municipalities through whose areas the road passes.

Edinburgh:

- (i) *prevailing legal and institutional frameworks in urban road transport.* In the UK, road networks are operated, controlled and maintained by local government agents, based on geographical boundaries, with the exception of motorways and a subset of other designated major roads (known as *trunk routes*), which are the responsibility of national government agents. The same division of power exists for the planning of new road infrastructure and associated improvements, with the exception that all major capital investments above a designated value that are proposed at the local level need to be referred to national level as part of competition for financial support from national funds.
- (ii) *prevailing framework for urban road transport pricing.* The vast majority of UK roads are free at the point of use. The only exception involves a limited number of major tunnels and bridges, where dedicated institutions have been set up to manage and maintain the facilities and passage tolls are charged towards the costs involved. The keepers of all motorised road vehicles are required to pay an annual licence fee to national government, to permit access to the road network, and all drivers pay significant levels of duty to national government related to the purchase of fuel. However, there are no clear links between the levels of these charge and costs associated with road transport. Parking charges are common, both on and off-street, in most urban centres. Where these are put in place by private operators, they simply contribute to operating profits; where they are levied by local government agents, they are normally used both to control the demand for parking within the capacity available and to raise revenue. Long-standing legislation decrees that all income from publicly owned parking space must be spent in the transport sector.
- (iii) *relationships between the key organisations/institutions.* Tensions between local government agents and national government agents on financial issues are relatively common. Local government budgets are derived from a combination of grants from national government (funded by general taxation) and local property-based taxes. However, there is a history of national government attempting to exert control over local expenditure by attempting to restrict the potential to raise local taxes. Within the local government environment, transport is, typically, managed alongside other local service sectors, such as health, education, social housing and public leisure facilities. Therefore, transport is often a fairly low priority for spending and there are clear incentives for local decision-makers to consider that any money collected locally (e.g. from road transport) should be spent locally, either within the transport sector or on other (more) politically emotive activities. Tensions can also exist between local and national government specific to road transport, as any policy that is likely to transfer transport related problems between roads which fall under different responsibility will obviously have consequences for the institution which inherits the problem. In addition, within local government, it is common for there to be competitive tensions between neighbouring geographical areas that have different interests. In Edinburgh, the urban region consists of nine such local government areas. Also, although Edinburgh is a stand-alone city (i.e. not part of a larger conurbation), the relative proximity of Glasgow means that their spheres of influence in road transport terms interact significantly, resulting in the potential for competitive tensions on a larger scale.
- (iv) *barriers to marginal cost-based pricing.* At present, there is no legislation to allow road pricing, either in urban or interurban situations. However, the national government is in the process of providing legislation to permit local government agencies to introduce road pricing (and workplace parking levies) as part of the current parliamentary session, including the possibility of electronic charging technologies. Decision-makers in Edinburgh are actively considering this as a policy option and the primary local barrier to implementation may be the ability to secure

agreement between the nine authorities that make up the urban region. From a traditional marginal cost pricing perspective, the key barrier may be the fact that the UK national government has guaranteed that all revenues generated will be retained locally and hypothecated for use within the transport sector for at least the first ten years of operation. Although the explicit objective of national government policy includes reducing congestion and containing growth in road travel demand, the generation of a revenue stream to provide alternatives to private car use is perceived to be every bit as important as using pricing as a mechanism to modify road travel behaviour.

Helsinki:

- (i) *prevailing legal and institutional frameworks in urban road transport.* Helsinki Metropolitan Area (PKS) as a single functional urban agglomeration consists of four neighbouring individual cities (legally municipalities): Helsinki, Espoo, Kauniainen and Vantaa. The geographical influence extend also to the surrounding municipalities. The institutional framework is rather complex. There is an administrative division of the road networks into the public (inter-urban) roads and (urban) streets. The Finnish National Road Authority (FINNRA) under the Ministry of Transport and Communication is currently responsible for the public roads when they are considered to have national interest. It is likely to be divided into a state agency responsible for administration and a government owned road production enterprise in 2001. FINNRA Production is currently divided into nine districts, one of them responsible for the roads in the Helsinki Metropolitan Area (PKS) which is a one functional urban agglomeration. The four cities can in principle independently decide upon their streets but they also co-operate through the Metropolitan Area Council (YTV) which has been set up through a special law.
- (ii) *prevailing framework for urban road transport pricing.* There are no existing forms of road tolls in Finland or locally managed forms of pricing other than parking which is governed by the cities. Finland has a special problem of sparsely populated country elsewhere than in the very south with no congestion problems and big interests in the industrial and regional policy and therefore serious issues outside this framework would arise. A common doubt therefore has been whether Finland, as a whole, needs policy tools like social marginal cost pricing for transport.
- (iii) *relationships between the key organisations/institutions.* The activities of FINNRA are mainly financed from the state budget. The state budget managed by the Ministry of Finance is financed through fiscal taxation and transport is one of the most important sources. The cities are responsible for street planning and use their municipal tax for it. Planning is also influenced by the Uusimaa Regional Council which is responsible for the general planning of transport and land use. Maintenance and administration normally belongs to cities in case of streets and to FINNRA in case of roads but some agreements exists between the cities and FINNRA concerning maintenance or traffic control for example in Espoo where large portion of the main street network actually consists of public roads. Investments on streets are financed by the cities and supported by state subsidies if the government considers a project nationally significant. Road investments are financed mainly by the state. As the development and financing of road construction involves in practise so many offices, specific agreements are negotiated between FINNRA, Councils and the cities usually in tandem with the public transport and land use issues.
- (iv) *barriers to marginal cost-based pricing.* As a new policy approach, road pricing would need new legislation concerning powers of introduction, institutional arrangements for operation, use of revenue and enforcement. During the last decade, road pricing (and associated legislation) has been suggested by a working group. However, the plan was withdrawn by the minister in charge after large public and institutional resistance. A strong social opposition still seems to exist to any toll. Therefore, until lately, officials have not considered the practicalities of such policies. The practical agreements would be relatively simple (e.g. compared with the technical problems), as efficient legal and institutional structures in addition to forms of co-operation are in place, but the negotiations would still encompass several administrative levels and would require a clear definition of the schemes for revenue allocation. Pricing schemes extending across city boundaries would result in many institutional players and in many agreements. This kind of process would not easily begin before there is enough political will for it. Nevertheless, after pricing has become an important issue in European policy, the Ministry of Transport has included pricing as a form of demand management in its objectives to be researched further.

Lombardy:

- (i) *prevailing legal and institutional frameworks in urban road transport.* Responsibilities for planning, finance, construction and maintenance of the road sector are allocated between the national government (international and inter-city roads), the regional government (regional road network) and the local governments (street and local road network). Traffic management is the competence of both the national government and the local governments. There are several agreements between institutions in many aspects. However, access control measures are usually decided without any agreements, as pricing is only carried out in restricted areas in the city centres.
- (ii) *prevailing framework for urban road transport pricing.* The “Nuovo Codice della Strada“ (New Street Law Code) allows municipalities to charge for the entry and circulation in restricted areas. This law makes it possible for the municipalities to implement urban road pricing schemes at local level, albeit only in the existing Controlled Access Areas or in areas of notorious sensitivity (“Zone di rilevanza urbanística“). However, no city has implemented such a scheme yet. A further new specific governmental regulation will allow the collection of the personal data from drivers entering both Controlled Access Areas and pricing areas.
- (iii) *relationships between the key organisations/institutions.* [*no text in the main report]
- (iv) *barriers to marginal cost-based pricing.* The main legal barriers are related to privacy and to the restriction of pricing to small urban areas within a single municipality. The national government plans to implement a thorough revision of the present law, with the aim to allow the municipalities to introduce pricing measures in the most congested urban areas. Such a revision will overcome the restrictions to the collection of personal data. However, no revision of the Street Law Code – needed to extend the pricing measures outside the Access Control Areas – is foreseen in the near future.

Madrid:

- (i) *prevailing legal and institutional frameworks in urban road transport.* Responsibilities for planning, finance, construction and maintenance are allocated between the national government (international and inter-city roads), the regional government (regional road network) and the local governments (street and local road network). Traffic management is the competence of both the national government and the local government.
- (ii) *prevailing framework for urban road transport pricing.* There are several agreements between the regional government and the national government regarding the development of the road network in the Region of Madrid. New radial accesses will be toll motorways, but they do not penetrate the city centre and have plenty of toll free alternatives. (The motorways are mainly devised for long distance traffic.) Besides, there is an innovate scheme based on “shadow tolls“ for an outer orbital motorway, but its end is to diminish the burden on the state budget.
- (iii) *relationships between the key organisations/institutions.* [*no text in the main report]
- (iv) *barriers to marginal cost-based pricing.* Road tolls are possible in principle, although some legal modifications would be needed if road pricing were to cover all trips entering a certain area. Agreements between institutions could be very complicated in case the area affected or the number of links included would be an important fraction of the total (except in the case where it was limited to a small urban area within a single municipality). In general, the praxis and the spirit of the laws are to set tolls as an exception and it is assumed that road use should normally be free.

Summary & conclusions

Following the logic of the format adopted above, the summary discussion is sub-divided under three headings: (i) legal and institutional frameworks for pricing urban road transport, (ii) institutional relationships affecting pricing policy in urban road transport and (iii) barriers to marginal cost-based pricing for urban road transport.

(i) legal and institutional frameworks for pricing urban road transport

61. The case studies undertaken demonstrate that, in general, the *legal and institutional frameworks and structures* required for the implementation of marginal cost-based road pricing are not yet in place in European urban areas. Marginal cost pricing principles have, to date, played little part in determining the prevailing pricing structures for road transport, particularly for urban areas. As a result, the prevailing legal and institutional frameworks have been established and have evolved, primarily, to cater for other political and economic concerns.

62. One clear example of this is the strong precedent that the primary form of explicit road transport pricing in EU member states is currently an annual licence fee, paid to national government, to permit unlimited access to the road network. This approach is wholly inappropriate if the objective is considered to be promoting efficient use of the road transport system, as it fails to relate the amount paid to usage or to differentiate in time and space to discourage congestion. However, it may be quite an effective approach for meeting the objective of collecting revenue for the national treasury.

(ii) institutional relationships affecting pricing policy in urban road transport

63. The key issue regarding *institutional relationships* in urban road transport pricing may be the national-regional-local dimension. At present, the major user payments made in respect to road transport (annual vehicle licensing and fuel duty) are paid to national government agencies. Only fees for local services, such as parking, are generally paid to local agents. Any pricing system which attempts to address the efficiency of urban road transport will, inevitably, need to involve local government agencies and to allow for differentiation between individual urban areas and regions. This will require quite significant modification of existing financial relationships, both between different levels of government and between different geographical units within the same government level, probably leading to rather greater complexity. In particular, the geographical boundaries used to divide nations into regions and/or the urban landscape into adjacent local municipalities would have the potential to become rather greater sources of conflict in the urban road transport sector than they are at present.

(iii) barriers to marginal cost-based pricing for urban road transport

64. The introduction of marginal cost-based pricing for urban road transport will require not only the creation of supporting laws and institutions, but also a significant change to the existing governmental culture with regard to road transport. The potential implications that national government may be required to cede both revenue and power to local and regional agents and that the different government levels will need to establish more complex relationships based around common goals may present extremely difficult practical barriers, at least in the short run.

Therefore, while some progress is apparently being made towards facilitating the introduction of road pricing in urban areas, the link to marginal cost pricing principles is, in general, not convincing, even where one of the primary stated objectives is to reduce congestion in the vicinity of the area that would be charged.

At the more detailed level, there are many potential barriers affecting the possibility of differentiating between urban road users in time and space, including issues related to adopting the automatic charging technology that such systems would probably require. These issues seem likely to vary considerably between countries, related to, for example, cultural variations in the perception of civil liberties (e.g. safeguards of individual privacy and the permissible uses of electronic information). The main catalyst for changes in issues of this nature may be growth over time in the use of new technology in other sectors (e.g. Internet retailing, remote work & study, mobile communications etc).

Therefore, in conclusion, it may be necessary to consider, separately, the legal and institutional constraints on urban road transport pricing in the short and longer run.

7.2 Considering marginal cost pricing for multi-modal transport

Overall review

The multi-modal setting has two key components:

- (i) pricing within the urban public transport sector; and
- (ii) the integration of urban public transport pricing with approaches in the road transport sector.

A critical issue which arises under both headings is the existence of, or potential for, public transport subsidy. These two perspectives are addressed in turn below.

(i) pricing within the urban public transport sector

In contrast to the road transport sector, direct charges for using public transport services are the norm in most urban environments, in Europe and beyond, via the almost universal existence of public transport fares. However, in common with the road transport sector, it is the case that marginal cost pricing principles play little (or, indeed, no) role in prevailing urban public transport pricing systems.

In general, urban public transport is provided by public and/or private institutions, at the local or regional level, and the primary role of fares is to contribute towards the costs of provision. In most urban environments, the revenue from public transport fares does not cover total infrastructure and operating costs, so that significant subsidies from public funds are common. The rationale for this approach is normally perceived to be the combined logic that: (a) mobility will bring social and economic benefits to the urban environment; and (b) cheap public transport will help to restrain the pressures for growth in private car use. Prevailing levels of subsidy vary considerably between countries and urban areas, but in some cases (e.g. Italy) they may make up as much as 80% of total operating costs.

The one major exception to the subsidy precedent is the U.K., where, following privatisation and deregulation of the provision of bus services in 1986, there have been much reduced subsidies towards urban public transport operating costs, limited to special ticketing arrangements for the young, disabled and elderly and particular

services which are considered to meet important social needs. It seems probable that the rising bus fares which have occurred subsequently have contributed towards the overall profile of falling urban public transport patronage which has been observed in most urban areas.

The mechanisms by which public subsidies are provided for urban public transport vary, dependent on the arrangements for provision. Factors of particular significance related to this may be the balance between national and local/regional responsibility in providing urban transport services and the mixture of public and private involvement in the public transport sector. In general, it has been observed that countries with stronger local and regional institutions tend to be those where the majority of subsidy comes from local funds (e.g. Germany, Austria, Spain and, in particular, Switzerland). Another dimension which may be relevant here is the apparent trend towards different arrangements in capital and provincial cities. In capitals, it is sometimes the case that public transport provision is the responsibility of organisations/institutions which are directly accountable to national government, rather than the lower level local and regional bodies. Therefore, implicitly, issues of financing and user pricing tend to be considered of national importance.

At a more detailed level, a breakdown of trends in public transport fares in European urban areas reveals that, although basic fare structures typically come from the concept of differentiated payments for each trip, this is not necessarily what happens in many practical situations. In particular, advance payment options for frequent users are the norm, generally providing travel at reduced rates and sometimes giving unlimited access for a period (e.g. a day, a week, a month or longer). Also, many prevailing ticketing systems rely on simple uniform payments for all journeys within broad areas and/or time periods, regardless of precise location and duration, to allow a degree of automation without introducing enforcement problems. It is sometimes stated that the fare structures for buses in the U.K. differentiate between journeys to a greater extent than in most other European urban public transport situations. However, the corollary to this observation is that it relies on a tradition that each passenger engages in a manual transaction with the vehicle driver, leading to considerably greater boarding times than are found elsewhere and, thus, reducing the attractiveness of public transport compared to the private car. Therefore, a general issue which may require careful consideration in the public transport sector is the trade-off between the desire to differentiate user fares from an economic efficiency viewpoint and the potential benefits of simplicity in practice for public transport operators and their customers.

Of course, all these issues presuppose that marginal cost pricing principles can be reconciled with more general issues regarding the economics of public transport operations. In particular, as discussed in AFFORD Deliverable 1, there are potential problems related to: (a) the fact that individual user fares based on marginal costs may be difficult to implement in practice, due to the nature of the relationship between cost and provision of capacity for multiple occupancy vehicles; and (b) the possibility that fare revenues based on marginal costs may fall short of the full costs of operation.

(ii) the integration of urban public transport pricing with approaches in the road transport sector

As rising levels of private car use are often perceived to be the key efficiency problem in practice in European cities, it could be argued that the relationship between the user pricing approaches within the public transport and private road transport sectors represents the most critical issue in the multi-modal setting. In simple terms, unless a *level playing field* exists for pricing between the alternative modes available to urban travellers, an inefficient balance of trips between modes will result.

At present, there are generally perceived to be several respects in which such parity does not exist in most urban environments. In particular:

- the largely indirect nature of pricing within road transport (e.g. annual vehicle licences and periodic payments of fuel duty when filling up the tank) may not be easily comparable with the greater tendency towards trip-related pricing for public transport and may, as a result, not encourage optimal travel behaviour;
- any pricing approach which provides unlimited access (e.g. most existing vehicle licences and some frequent user tickets for public transport) will, once paid, tend to bias the traveller in favour of the mode in question;
- the sum of user prices paid by urban motorists might reasonably be expected to be significantly below the total marginal social costs imposed;
- the sum of user fares paid on public transport is not normally related closely to the total marginal social costs imposed: where passengers pay fares approximating the full costs of operating the service (e.g. the U.K. bus sector), it might reasonably be expected that the sum of fares paid will exceed marginal social costs, but where significant operational subsidies are available, the opposite may be true; and
- the lack of integration (and, thus, comparable differentiation) affecting the prices charged in the road transport and public transport sectors might be expected to make pricing parity for any specific individual trips almost non-existent in many cases.

Overall, it is commonly suggested that the relationship between prevailing pricing approaches in urban road and public transport may tend to tip the scales in favour of encouraging private car use.

Case studies

As in section 7.1, the following text reports the findings of the case study reports and questionnaires, by case study location, under four headings: (i) prevailing legal and institutional frameworks in urban road transport, (ii) prevailing framework for urban multi-modal transport pricing, (iii) relationships between the key institutions and (iv) barriers to marginal cost-based pricing.

Athens

(i) prevailing legal and institutional frameworks in urban multi-modal transport. At national level, multi-modal transport issues are considered by the Ministry of Transport and Communications.

At local level, the Athens Area Urban Transport Organisation (OASA) is responsible. There are no complications related to contractual agreements with operators, as all public transport modes are publicly owned. However, several institutions are involved on the operational side, notably: ISAP (underground railway and “green buses”); ETHEL (buses) and ILPAP (trolley vehicles).

- (ii) *prevailing framework for urban multi-modal transport pricing.* Urban public transport is subsidised by the national government. User pricing policy for the Athens Public Transport System is decided by the Ministry of Economy, in co-operation with the Ministry of Transport and Communications and OASA. In April 1998, OASA published a Green Paper on Urban Transport including specific proposals for public transport funding from charges on the use of private cars. Recent legislation (December 1998) includes a provision for the allocation of a proportion of revenues from bus lane violation fines to public transport.
- (iii) *relationships between the key organisations/institutions.* [*no text in the main report]
- (iv) *barriers to marginal cost-based pricing.* Although the precedent for cross-subsidy between different urban transport modes clearly exists, current intentions appear to be to use it for investment in public transport service improvements, rather than to promote pricing parity between modes. However, the potential to introduce multi-modal marginal cost-based pricing may be helped by the precedent of significant subsidies for public transport services (which means that full coverage of operating costs is not expected) and the fact that the institutions currently involved in formulating pricing policy are all government agencies, including both national and local levels. [*this is largely my interpretation of (i) & (ii), as nothing explicit was said of obvious relevance]

Edinburgh

- (i) *prevailing legal and institutional frameworks in urban multi-modal transport.* Multi-modal transport issues are the responsibility of the South East Scotland Transport Partnership (SESTRAN), made up of representatives from the nine geographically distinct local government agencies covering the urban region. All public transport operators are privately owned and free to choose the services they wish to operate in response to demand. Contractual agreements between the private operators and responsible public institution are primarily limited to safety and service quality issues. The public agency can only control a limited number of services which are deemed to be of social importance.
- (ii) *prevailing framework for urban multi-modal transport pricing.* Private public transport operators are largely free to decide their own user pricing policy on commercial grounds, although the responsible public agency can negotiate some special ticketing arrangements. This facility is used primarily to provide subsidised travel for social purposes (e.g. the elderly) and to promote integration between different public transport modes through common ticketing initiatives. However, the private operators are not obliged to take part in such schemes. Subsidies are only available for a minority of public transport services which are considered of social importance and are provided as part of a tendering process with private operators. Such subsidies guarantee the continued existence of services, but do not contribute to lower fares.
- (iii) *relationships between the key organisations/institutions.* Although SESTRAN exists to provide coherent multi-modal transport policy for the urban region, tensions based on the different interests of the individual constituent local government areas are not uncommon. Most of the effective powers within the road transport sector lie with the individual local government agencies and it is generally considered that most of the effective powers in the public transport sector lie with the private operators. The recent setting up of the Scottish Parliament, based in Edinburgh, may, over time, result in more influence from higher level government agencies affecting multi-modal transport issues in the city.
- (iv) *barriers to marginal cost-based pricing.* The key barrier to marginal cost pricing in the multi-modal setting is the very limited influence which government agencies can currently exert over public transport fare policies. This could only be reversed by significant modifications to national legislation, resulting in increases in public transport regulation. Such changes are not currently being considered. In addition, the lack of a powerful institution to take responsibility for multi-modal transport across the urban region, largely independent of the geographically smaller local government agencies may hinder the potential for reaching agreement on politically contentious policy initiatives.

Helsinki

- (i) *prevailing legal and institutional frameworks in urban multi-modal transport.* The highest multi-modal transport authority is the Ministry of Transport and Communication but the cities are legally individual entities. As part of its capital status, Helsinki has a special interest for the government and it is often an involved party in the transport and infrastructure issues in addition to the institutional setting described in chapter 7.1 incremented with one major player (National Rail Administration) for rail which constitutes a large part of the public transport services. Public transport services are arranged through contractual agreements with a mixture of private and publicly owned operators.
- (ii) *prevailing framework for urban multi-modal transport pricing.* Public Transport fares are regulated by the Metropolitan Area Council, in the case of regional trips, and by local city councils in the case of trips within the individual cities. In the Helsinki Metropolitan Area, the national government does not contribute to the operation costs of the regional public transport and the deficit is borne by the city councils. The current approximately 50 % deficit in public transport operation costs results from the policy to keep up the supply of public transport in order to retain its high mode share and to reduce the adverse effect of the road transport.
- (iii) *relationships between the key organisations/institutions.* Integrated multi-modal issues, such as the comparison between public transport and the road transport sector, do not pose any major problems related to co-operation between the individual modal institutions, as there is a long-standing precedent for these issues being considered.
- (iv) *barriers to marginal cost-based pricing.* The road transport sector currently has no local pricing systems and the concepts of cross-subsidisation between private road and public transport and the ear-marking of revenues from charging would require complex agreements between institutions, as the current transport pricing system is based on charges reflecting direct modal costs and/or the needs for fiscal taxation. This would require new legislation, which could prove difficult to agree among politicians and the various interest groups. The local tax-based subsidisation of public transport is generally considered a long-standing successful working solution, as it does not require any intervention by the national government. Therefore, attempts to modify approaches in this area might be expected to meet considerable opposition. However, it is primarily the philosophy of marginal cost pricing (and how it differs from the prevailing pricing culture) which appear to be major barriers, as the structures which would be required to implement marginal cost-based multi-modal transport pricing from a technological and organisational viewpoint are either largely in place already or under construction.

Lombardy

- (i) *prevailing legal and institutional frameworks in urban multi-modal transport.* A dedicated multi-modal transport authority does not currently exist, but the creation of such an institution is foreseen in the near future, to take responsibility for the enforcement of European, national and regional regulations, as well as for the control of public transport operators. The municipality of Milan is also planning to establish a “Mobility Agency“, which will (on behalf of the city government) take charge of public transport planning, the regulation of transport-related companies and traffic management. At present, public transport services are provided on the basis of contractual agreements between the operators and the appropriate general government agency. For buses and local railways within the urban region, policy-making takes place at regional level, while intercity rail services fall under the responsibility of national government.
- (ii) *prevailing framework for urban multi-modal transport pricing.* The operation of different public transport modes is subsidised by the public bodies responsible, primarily as compensation to operators for wide-spread unified ticketing and user tariff arrangements. The revenues from monthly travel cards are distributed to the various organisations involved, according to the percentage of cards holders using each mode. Some facilities already exist to support cross subsidies from the private car sector to public transport.
- (iii) *relationships between the key organisations/institutions.* [*no relevant text in main report]
- (iv) *barriers to marginal cost-based pricing.* A key barrier to the introduction of marginal cost-based multi-modal transport pricing would appear to be the precedent for heavily subsidised periodic public transport tickets which allow unlimited access to services. The current lack of an institution dedicated to overseeing multi-modal transport issues across the urban region may also be an important barrier. Although such an institution is planned, it may not be in a position to consider a change in multi-modal transport pricing culture until it is well established.

Madrid

- (i) *prevailing legal and institutional frameworks in urban multi-modal transport.* The Regional Transport Consortium has all responsibility for overseeing public transport at the regional government level and for any local municipality which has delegated its powers. Public transport services are provided on the basis of contractual agreements with operators.
- (ii) *prevailing framework for urban multi-modal transport pricing.* Public transport fare policy is the responsibility of the Regional Transport Consortium. The operation of the different public transport modes are heavily subsidised by the public bodies in charge, primarily as compensation for the unified ticketing and user tariff arrangements covering all operators. Revenues from monthly travel cards are distributed to the various organisations involved according to the percentage of cards holders using each mode. [*why is the text I inherited for this identical to that for Lombardy?]
- (iii) *relationships between the key organisations/institutions.* [*no text in main report]
- (iv) *barriers to marginal cost-based pricing.* Cross-subsidies between transport modes are unlikely to be possible, because existing legislation does not allow taxes to be hypothecated towards specific expenditures in any way. Fundamental changes in national financial legislation would be required to change this and there are no plans to do so.

Summary & conclusions

Following the format adopted in section 7.1, the summary discussion is sub-divided under three headings: (i) legal and institutional frameworks for pricing multi-modal transport, (ii) institutional relationships affecting pricing policy in multi-modal transport and (iii) barriers to marginal cost-based pricing for multi-modal transport.

(i) legal and institutional frameworks for pricing multi-modal transport

65. A clear deficiency in many European urban situations is the lack of strong, well-established dedicated institutions with the powers to oversee and control multi-modal transport pricing across urban regions. The tendency towards much of the decision-making power resting with geographically limited local government agents in some cities results in a much more complex legal and institutional structures than are desirable or efficient when attempting to achieve coherent multi-modal transport policy across the full urban area and its sphere of influence.

Two particular, related issues which exacerbate this problem are:

- the general precedent that the private road and public transport sectors tend to be dealt with by different organisations/institutions, sometimes at different levels of government; and
- the involvement of private sector organisations/institutions in urban transport, such as in operating public transport services.

The potential benefits of treating urban transport at the multi-modal level are generally being realised, as a result of the previous failure of mode specific policy-making to address urban transport problems and the subsequent popularity of more innovative integrated policy approaches. However, there may be a need for urban transport planning and pricing systems to evolve quite significantly over time towards a more integrated, regional culture before full multi-modal urban transport pricing systems can be achieved.

The issue of private sector involvement (where it is relevant) also results in difficulties that may take some time to resolve. One key issue is the need to ensure the existence of legislation and regulation that gives government agents the power to influence multi-modal transport pricing. However, a more fundamental point may be the potential political difficulty that exists related to contractual agreements between public and private organisations/institutions. In particular, politicians and their electorate may quite reasonably be expected to question the acceptability of transfers of money between public and private organisations/institutions, related to the somewhat contradictory (public service and private profit) objective that motivate them. It is possible to conceive of many detailed situations where these issues could constrain the financial and pricing arrangements that are adopted. One obvious example might be public subsidies paid to a profit motivated private public transport operator in a situation where fares are based on marginal costs, rather than heavily subsidised for the clear direct benefit of users. In practice, it may be that, in the long-run, policy-makers will be forced to consider a trade-off between perceived efficiency benefits from privatisation within a subset of the urban transport market (e.g. the urban bus service sector) and the efficiency of urban transport overall.

(ii) institutional relationships affecting pricing policy in multi-modal transport

66. In addition to the issue of the need for relationships between institutions at different levels (as raised above, for urban road transport), the key issue in the multi-modal context may be the sheer volume of institutions which would need to be involved, including all government agents responsible for any aspect of transport provision and pricing within the urban region, plus the full range of public transport operators. In the case where private public transport operators exist, there may even be several competing operators within any given mode. Therefore, in some situations, a prerequisite for introducing a comprehensive multi-modal transport pricing system across an urban region may be a degree of legislative and institutional modification to simplify the arrangement in the existing situation.

(iii) barriers to marginal cost-based pricing for multi-modal transport

67. The discussions above imply a number of barriers which may hinder progress towards any multi-modal urban transport pricing policy. However, as for road transport, the key barrier when focussing on marginal cost-based pricing may be the need to change existing transport pricing culture.

In particular, the user prices paid in respect of public transport services are traditionally based on two criteria (either separately or in combination):

- the full financial cost of providing the service; and
- the perceived potential social and economic benefits of the availability of cheap travel.

Abandoning either (or both) of these principles is likely to be extremely contentious and require considerable effort to be expended on reform. In the case of the second, a

detailed consideration of inter-sectoral issues (to be discussed in section 7.4) and a more sophisticated understanding of the determinants of travel behaviour and how it relates to participation in critical lifestyle activities may be required if the risk of significant problems related to social exclusion are to be avoided.

Although economic theory suggests that the most efficient use of revenue from transport pricing would be to lower (for example) general labour taxes, rather than to hypothecate it for use within the transport sector, national legislative regimes which forbid any hypothecation of tax revenues may restrict the range of practical second-best pricing solutions which are available in the multi-modal context. In particular, some degree of implied hypothecation at local level may be critical to securing public and political acceptance of locally imposed pricing schemes. On the other hand, legislative and/or institutional structures which require hypothecation and, potentially, prevent any transfer of revenue to lower taxes in other economic sectors may hinder the ability to achieve efficiency objectives.

A critical issue of political acceptability, raised by policy-makers in all the case studies, is the perception that feasible alternatives must be available for travellers likely to be adversely affected to a significant extent, in advance of the introduction of any new transport pricing system. This issue is most clearly perceived related to proposals to introduce road pricing. The implication is that a change of pricing approach may result in unacceptable levels of disruption and hardship in the short-run, because travellers will have little option but to continue their existing lifestyle and activity patterns until longer run adjustments (e.g. in residence and employment) have occurred. In the multi-modal context, this means that it may be necessary to invest significant sums of money in new and improved transport services (particularly in public transport) before the introduction of marginal-cost based pricing, which might have important legal and institutional consequences. For example, raising the capital necessary to achieve this might require either a major investment of national public funds (possibly more difficult to obtain outside capital cities) or the involvement of private financial institutions in the transport pricing consortium. The latter could lead to financiers wishing to influence the nature and objectives of an urban transport pricing system in ways that may not be consistent with social efficiency objectives.

It is possible that the need to invest significant sums in transportation to address short-run problems could be limited by adopting a phased approach to the introduction of marginal cost-based pricing. Such an approach might involve a commitment from all levels of government to take gradual steps towards a multi-modal marginal cost-based solution using existing pricing approaches, to encourage the evolution of location and activity patterns towards a more efficient solution before major new transport pricing approaches are introduced. The key difficulty with this suggestion is the fact that existing pricing mechanisms for road transport may be insufficiently flexible to promote efficient behaviour without some form of road pricing innovation.

7.3 Focussing on marginal cost pricing in a spatial and geographical context

Overall review

68. Any analysis of marginal cost-based pricing which focuses solely on the transport sector (in the single- or multi-modal context) will, implicitly, tend to focus on short-run pricing issues related to prevailing travel patterns. However, transport is essentially a 'derived demand', which depends upon the spatial and temporal arrangement of lifestyle activities. If pricing within the transport sector is inefficient (as we expect it to be in urban areas at present), then the arrangement of the associated activities may also be inefficient as a direct consequence. For example, if private car users currently pay significantly less than the marginal social costs of their journeys, we might expect that the spatial diversity of their activity profiles would be greater than under efficient pricing (leading to more travelling), while the temporal diversity would be less (as a result of a greater tendency to travel during peak periods).

69. Although economic theory suggests that the application of short-run marginal costs within the transport sector will encourage greater spatial and temporal efficiency, this will tend to require both travellers and activity providers to modify long-run decisions, such as location of residence, location of employment and activity provision / involvement, temporal constraints on employment and activity provision / involvement etc. Therefore, moving to a setting which includes spatial issues will necessitate a broader and more complex approach. In practice, it seems self-evident that resolving long-run issues related to the spatial and temporal arrangement of activities provides the key for achieving more efficient and sustainable urban environments. However, from an urban transport policy-making perspective, it is also likely to make the problem appear much more demanding.

In particular, when considering practical second-best issues, the question arises of whether it is feasible to expect significant progress towards more transport-efficient urban land use patterns purely on the basis of urban transport pricing innovations. Typically, transport costs currently make up only a very small proportion of both total private household budgets and total business production costs. Therefore:

- (i) small proportional distortions in other larger economic markets which affect spatial and temporal activity patterns (e.g. the land market) may outweigh the impacts of any feasible changes in urban transport pricing; and /or
- (ii) the scale of increase to urban transport costs which would be required to produce significant long-run changes in land-use patterns may prove politically unacceptable in the short-run because, in order to be effective, it would need to cause significant hardships to private travellers and to result in significant reductions in turnover for many businesses.

The implications of this may be that there is a need to consider practical second-best pricing (and non-pricing) measures which provide behavioural signals that relate as much (if not more) to the long-run spatial and temporal arrangement of urban activities than to short-run travel choices. Such measures might include:

- modified vehicle licensing or additional permits for road transport which include clear spatial and temporal dimensions (e.g. permits which are required to access particular areas of the urban network at particular times);
- more sophisticated and extensive application of charges for parking, at home and at activity locations;
- subsidies (or regulations) to encourage alternative more travel-efficient activity involvements (e.g. flexible working hours and the use of information technology to reduce the need for travel, such as tele-working and, where appropriate, internet-based retail services);
- government intervention in the land market, to impose taxes and subsidies (and / or regulations) affecting the locations chosen for new residential and activity related land use developments; and
- the introduction of some form of continuous activity impact pricing for existing developments, as a part of local property taxes and business rates.

In certain respects, these measures may be rather easier to implement than those aimed purely at the transport sector, as they may not require the degree of differentiation that would be needed to encourage more efficient short-run travel patterns and may, as a result, be rather less reliant on the introduction of electronic technology. On the other hand, measures which have more direct consequences for business and the perceived short-run health of the urban economy may prove more difficult for local policy-makers to implement unilaterally and may, therefore, require significant actions to facilitate implementation at national and European level.

Case studies

As in previous sections, the following text reports the findings of the case study reports and questionnaires, by case study location, under four headings: (i) prevailing legal and institutional frameworks in the spatial context, (ii) prevailing framework for pricing in the spatial context, (iii) relationships between the key organisations/institutions and (iv) barriers to marginal cost-based pricing.

Athens [*no info on land-use planning in main report]

- (i) *prevailing legal and institutional frameworks in the spatial context.* Area licenses and peak permits are already permitted for road transport by existing legislation. They operate in the central and historic areas of the city for environmental purposes, on the basis of odd and even vehicle number plates, although some categories of employment are exempt and given special entry permission at all times. Local government agencies define and collect parking fees within their area of responsibility.
- (ii) *prevailing framework for pricing in the spatial context* The existing number plate-based area licence system currently has no formal pricing element. Parking fees provide a source of revenue towards covering general local needs and can be increased by a certain amount, without any legal constraints. However, the approval of the national government is required to ascertain that increases will not affect the targeted inflation rate index. Parking charge policy currently varies significantly between local municipalities.
- (iii) *relationships between the key organisations/institutions* The existing number plate-based area licence system involves co-operation between local municipalities, the national Ministry of Public Works and Environment and the police authorities.
- (iv) *barriers to marginal cost-based pricing.* Only relatively minor changes to regulations would be required to allow existing permit arrangements to be converted to a pricing approach. However,

the practical and political implications of applying such a policy more widely across the urban area to impact on land uses may be rather more complex than those for the prevailing system, which is limited to the downtown areas.

Edinburgh

- (i) *prevailing legal and institutional frameworks in the spatial context.* In the U.K., the interaction of practical transport and land use planning decision-making has, traditionally, tended to be rather limited. In government, transport has been treated as a service (alongside issues such as health and education), the key aim of which is to accommodate demand, while spatial planning has tended to be thought of as subordinate to the trade and industry sectors, contributing towards the general objective of maximising economic growth. Although the growth of urban road use and the problems it has caused has led to a significant reconsideration of the role of transport policy-making, towards measures which attempt to manage demand rather than cater for continuous increases, the link with land use and activities has yet to be incorporated. The majority of land use development decisions are made at local government level, by a dedicated planning committee involving local politicians, in response to proposals from private owners and developers. Land use proposals are assessed on the grounds of their perceived general economic and social impacts for the community and competition for private investment between areas will often result in economic growth being treated as the primary criterion. Although it is not uncommon for private development proposals to be rejected or modified on transport grounds, this is most frequently on the basis of tangible short-run impacts, rather than related to more general principles of encouraging car use and dependency. Even where individual local government areas have set a precedent of rejecting proposals for new developments on grounds related to transport efficiency (e.g. in respect of out-of-town retailing), the economic pressure from developers over time has tended to make such policies difficult to sustain.
- (ii) *prevailing framework for pricing in the spatial context.* At present, road transport pricing based on spatial and/or temporal permits is not possible, but such systems are included in the national government's current proposals to permit road pricing. Both public and privately imposed parking charges are common in city centres, but there is little precedent for them across the wider urban area. As an alternative to road pricing, the proposed national legislation includes provisions for a *Workplace Parking Levy (WPL)*, to allow businesses to be charged a periodic fee for parking capacity which is currently provided free to their employees (up to 50% of total parking capacity in many urban centres). However, considering large, out-of-town retail parks, there are currently no proposals to extend the WPL to cover customer parking. Longstanding legislation decrees that all revenue from parking charges must be hypothecated within the transport sector. To date, there has been little practical progress towards measures aimed directly at encouraging more transport-efficient land uses, although there is a precedent for local government agencies to require major developments to contribute significantly towards local transport policy objectives, such as the provision of improved public transport infrastructure.
- (iii) *relationships between the key organisations/institutions.* As responsibility for both urban transport and land use planning lies with local government, the opportunity for greater integration of the two functions is clearly present, even if it is not achieved fully at present. The key relationships which may cause difficulties are those between different local government areas, that may perceive a considerable degree of mutual competition for attracting investment, and between local government agencies and developers. In particular, there may be an imbalance of formal and effective powers between a local government agency responsible for planning decisions within quite a small area of limited economic status and a large national or multi-national company. From this viewpoint, a predominantly wealthy local government agency, representing a capital city centre (such as the City Council in Edinburgh) may fare rather better than less well-off provincial towns or more peripheral local government areas within the urban region.
- (iv) *barriers to marginal cost-based pricing.* As for the previous settings, the key barrier is likely to be the fact that adopting a marginal cost pricing-based approach would imply a significant change of pricing culture. In particular, measures which focus charges on land use (such as the WPL) have, so far, proved to be much less acceptable to business representatives than road pricing. Encouraging uptake of measures to promote alternatives to existing travel patterns and to charge activity providers for the transport related impacts they generate would require significant policy initiatives at national level, which have not, so far, formed part of current government strategy.

Helsinki [*no info on land-use planning in main report]

- (i) *prevailing legal and institutional frameworks in the spatial context.* Area licenses and peak permits are considered by the institutions impractical, difficult and expensive to enforce as the practical experiences with a system of zonal parking permits have shown. Parking charges in urban centres are already a tested and well-established system which may be considered to reflect the marginal cost principles to some extent. However, a demand management problem exists with free parking arranged by companies to their employees and customers.
- (ii) *prevailing framework for pricing in the spatial context.* The levels of parking charges are decided by local government and are adjusted at 5-10 year intervals according to demand. Levels vary with the distance from the city centre. With emerging new technology, new ways to vary the charges (e.g. according to time period) will be possible.
- (iii) *relationships between the key organisations/institutions.* [*no text in the main report]
- (iv) *barriers to marginal cost-based pricing.* With the spatially differentiated systems of charging, in general, there are concerns about the spatial and equity impacts among the administrative and planning institutions. Administrative or zonal borders and local effects, for example near the road toll rings, may pose too serious problems for certain population groups and travel purposes which may be difficult to control.

Lombardy

- (i) *prevailing legal and institutional frameworks in the spatial context.* Area licenses and peak permits are applied in several cities in two ways. First, the access to the historical centres of the cities is reserved to the residents. The power to establish Controlled Access Areas is given to the municipalities by the Street Law Code. The size of the restricted areas depends on the political choice of the local governments, related to the protection of the environment, but it is always limited to the city centres. Second, a recent regulation by the Ministry of Environment forces the municipalities to restrict access to urban areas (sometimes affecting many municipalities), during the peak hours or for all day, when the pollution exceeds the standard set by the law. The regional government monitors the pollution rate, and, if needed, gives orders to restrict access to the polluted areas. The local municipalities have the power to decide on the number of parking places and to set fees.
- (ii) *prevailing framework for pricing in the spatial context.* Long-stay parking on publicly owned parking lots is discouraged by a rising rate per hour. Residents usually enjoy special permits to enter the Controlled Access Areas, where they have free parking. The local municipalities are increasing the number of on-street places subject to payment and the extension of the payment to the residents is under consideration.
- (iii) *relationships between the key organisations/institutions.* [*no text in the main report]
- (iv) *barriers to marginal cost-based pricing.* [*no text in the main report]

Madrid

- (i) *prevailing legal and institutional frameworks in the spatial context.* Peak permits are in force for small areas, and lorry restrictions are common. However, for larger areas, some specific modifications to existing laws would be necessary.
- (ii) *prevailing framework for pricing in the spatial context.* Local municipalities cannot adjust the prices of public parking as they desire, for policy purposes. Existing legislation decrees that parking capacity on public land must reflect the cost of providing the service. Private car park operators are completely free to set tariffs on commercial grounds.
- (iii) *relationships between the key organisations/institutions.* [*no text in the main report]
- (iv) *barriers to marginal cost-based pricing.* If an area to be defined as a spatial and/or temporal permit zone included several local municipalities or different institutions responsible for road transport, the feasibility of the measure would depend on complex negotiations. Amending legislation to allow parking charges to be adjusted locally to reflect external costs of road travel would require fundamental changes at national level. Any attempt to exert public control over the tariffs charged by private car park operators would probably require new national legislation and would potentially require complex negotiations between local municipalities and the private operators concerned.

Summary & conclusions

Following the format adopted in previous sections, the summary discussion is subdivided under three headings: (i) legal and institutional frameworks for pricing transport in the spatial and geographical context, (ii) institutional relationships affecting transport pricing policy in the spatial and geographical context and (iii) barriers to marginal cost-based pricing for transport in the spatial and geographical context.

(i) legal and institutional frameworks for pricing transport in the spatial and geographical context

70. A precedent already exists in some European urban areas for spatial and temporal access permits, but these are primarily restricted to downtown areas and, currently, tend to be based on regulation rather than pricing. However, plans to permit permits based on pricing appear to exist in a number of states. Parking charges are organised in a similar fashion in most European urban areas, but only the WPL proposals in the U.K. currently appear to have the potential to extend parking fees to the broader spatial context. Other measures which are aimed more directly at land uses are much less common and tend to be considered largely outside the scope of transport policy-making. However, as land use planning is quite commonly the responsibility of local government agencies, the potential for greater integration of land use policy-making with local transport pricing initiatives clearly exists.

(ii) institutional relationships affecting transport pricing policy in the spatial and geographical context

71. The key *institutional relationships* in the spatial and geographical context may reasonably be expected to include relationships between those government agencies responsible for transport and land use policy-making. In some cases, this may actually involve relationships within the same formal government institution and relate primarily to the lack of integration in the treatment of transport efficiency and economic prosperity goals. Other important relationships will involve policy-making at different government levels (i.e. greater integration of land use and transport policy-making may need to be considered at national and European level if it is to be implemented locally) and the relationships between government agencies and private developers and land use operators.

(iii) barriers to marginal cost-based pricing for transport in the spatial and geographical context

72. A major difficulty for considering marginal cost-based pricing in the spatial and geographical context is the need to implement charges over a wide geographical area, rather than limited to a compact city centre. In particular, the need to involve geographically distinct local government agencies within a single charging system would, inevitably, lead to practical and political complexity. As for the multi-modal setting, the lack of a single, independent transport authority responsible for pricing issues across the urban region is a drawback in most urban situations. However, even

where such an authority might exist, a restriction of its powers to the transport sector may still hinder the ability to address spatial issues.

73. While many urban policy-makers are starting to show general interest in promoting measures such as tele-working, such initiatives are often not considered to be a direct element of transport policy and the existence of some ambiguity regarding precisely which policy area they form part of can tend to retard progress in implementation. A major issue is the fact that securing funds may involve transfer of revenues both between policy areas (e.g. from road transport) and across geographical boundaries (i.e. between neighbouring local government areas).

7.4 Covering inter-sectoral aspects of marginal cost pricing

Overall review

Inter-sectoral aspects of marginal cost pricing include:

- (i) impacts on the base of fiscal taxation;
- (ii) inter-sectoral revenue transfers without hypothecation (e.g. to lower labour taxes); and
- (iii) the question of whether similar marginal cost-based pricing principles are applied in other related sectors (with potential implications for the efficiency of resource allocation between sectors).

Car ownership taxes and fuel taxes are normally based on fiscal principles. Therefore, the revenues go directly into the state budget or general national governmental funds, to be used for covering various types of (unspecified) national needs. Adjusting these taxes to reflect marginal cost pricing principles would necessarily affect fiscal taxation. This has important legal and institutional implications and may be perceived as politically unacceptable by representatives of national governments. On the other hand, general public attitudes regarding perceptions of value-for-money obtained from national taxation may make the introduction of new non-hypothecated taxes related to transport politically unacceptable from their perspective too.

Therefore, inter-sectoral issues may play a critical role in determining the practical feasibility of theoretically efficient pricing for urban transport.

Case studies

As in previous sections, the following text reports the findings of the case study reports and questionnaires, by case study location, under four headings: (i) prevailing legal and institutional frameworks in the inter-sectoral context, (ii) prevailing framework for pricing in the inter-sectoral context, (iii) relationships between the key organisations/institutions and (iv) barriers to marginal cost-based pricing.

Athens

- (i) *prevailing legal and institutional frameworks in the inter-sectoral context.* Both road vehicle licensing and fuel taxes are implemented and enforced nationally, by the Ministry of Finance. National government is able to adjust levels of fuel taxation without any changes in the existing legislation, taking account of the impact on the national inflation index.
- (ii) *prevailing framework for pricing in the inter-sectoral context.* Revenues from road vehicle licensing are used to cover general national needs, including possible improvements of the transport system. Revenues from fuel taxation generally go directly to the state budget. However, a portion of the revenues is dedicated for funding road projects in the Athens Metro Area.
- (iii) *relationships between the key organisations/institutions*
- (iv) *barriers to marginal cost-based pricing.* No change in the existing legislation would be needed to introduce differentiated car taxes, although approval would need to be sought regarding potential impacts on national inflation. The national Ministry of Finance is responsible for the enforcement and implementation of road transport taxation (fuel, vehicle licensing) as well as for revenue redistribution, so the use of revenues to lower labour taxes should be possible if it is deemed politically acceptable.

Edinburgh

- (i) *prevailing legal and institutional frameworks in the inter-sectoral context.* Road vehicle licensing and fuel taxation are the responsibility of national government, which can raise or lower charge levels at will.
- (ii) *prevailing framework for pricing in the inter-sectoral context.* Following international consultation on the global environment, the national government followed a policy of automatic annual increases in fuel taxation above inflation for environmental reasons for several years. However, in response to growing pressure from the public and transport industries, this policy has been abandoned. The government has, instead, given a commitment that future increases in fuel tax will only occur if it is considered important to raise public funds for investment in the transport sector and that any additional revenue generated as a result will be hypothecated for this purpose. With regard to vehicle licensing, the national government has recently set a precedent of introducing differentiated annual road vehicle licences for private cars, related to engine size.
- (iii) *relationships between the key organisations/institutions.* An important factor in Edinburgh is the recent creation of a devolved Scottish Parliament which has powers to take decisions on some taxation and expenditure issues and which can, in principle, raise additional tax revenue. Therefore, it is possible that national taxation issues, which are totally inflexible elsewhere in the U.K., may be varied in the Scottish regional context.
- (iv) *barriers to marginal cost-based pricing.* In respect of the three aspects of the inter-sectoral setting identified in the overall review, significant barriers exist in all three areas. Certainly, it seems unlikely that it would be safe to assume that other economic sectors apply marginal cost pricing principles and are free from distortions. For example, major concerns have been expressed regarding the social welfare implications of road pricing for lower socio-economic groups in the U.K.. Cheap transport is sometimes viewed as essential to make up for failings within the employment and social welfare sectors. In addition, it seems unlikely that the national government would be prepared to give an undertaking that the levels of national road transport taxes should be based on marginal costs. There appears to be an emerging consensus that transport taxes can no longer be seen as primarily for national revenue raising purposes, due to the fact that road use is now perceived as a necessity to full participation in society, rather than a luxury. However, the prevailing government attitude, in the wake of recent fuel tax protests, appears to be that, within national revenue constraints, the political sensitivities of private and business drivers are the most important determinants of road taxation policy. Regarding the potential for inter-sectoral revenue transfers, the national government has given a firm undertaking that any local government agency which introduces road pricing or WPL under their proposed legislation will keep ALL revenue, hypothecated towards the local transport sector, for at least the first ten years of operation. Thus, there appears to be absolutely no prospect of inter-sectoral revenue transfers from urban transport pricing in the short-run.

Helsinki

- (i) *prevailing legal and institutional frameworks in the inter-sectoral context.* Fiscal policy is a combination of state and municipal taxes. Although municipal taxes are decided by each Municipal Council, all taxes, local and national, are collected by the Central Tax Office. The Parliament and the local governments must be consulted before modifying the fiscal policy. Usually, the interest groups are consulted only informally. (The legislative power is vested at the Parliament, according to the Constitution.) Draft bills emanate from the Ministry with the responsibility for the matter in question. The bills are debated at respective Parliamentary Committees.
- (ii) *prevailing framework for pricing in the inter-sectoral context.* The revenues from fuel taxes go to general national governmental funds, and are used for covering any type of national need. Certain lobbies have raised concerns of the impacts of increasing fuel taxes on the accessibility and to the full cost coverage of road transport sector. So far this has not changed the policy behind the fuel tax. Zone-based fuel taxation is considered cumbersome and easy to avoid by users and, therefore, probably causing more trouble than worth. Car taxes are quite high compared to most European countries. (Also, car taxes are viewed as having an impact on safety, by increasing the price of cars and thus discouraging drivers from acquiring technologically safer cars.) All of the taxes from transport sector are politically justified in practise by the fiscal needs and not by cost coverage of environmental reasons.
- (iii) *relationships between the key institutions.* The policy principles for finance, charging and taxation are nowadays largely fixed by the Government programme for the duration of its period in power. As the taxation is based on the fiscal policy the Ministry of Finance being in charge of budgeting is in a strong institutional position in case a reform is needed in transport charging. The Ministry of Transport has traditionally been in charge of the regulation.
- (iv) *barriers to marginal cost-based pricing.* The way that the Ministry of Finance has controlled the fiscal policy and budgeting in the past and the trend of increasing taxation has created some suspicion in the transport sector about the financial measures as the revenues are governed outside the sector. Therefore the institutional barriers for pricing may remain high in the transport sector although the actual reasons of demand management or efficiency may be supported. For Ministry of Finance, the practicalities and (cost) efficiency of pricing and taxation is crucial. Their experience is that many practical problems emerge with ear-marking.

Lombardy

- (i) *prevailing legal and institutional frameworks in the inter-sectoral context.* The regional administration manages a share of the revenues from fuel taxes collected within the Region since 1997. There are different decision making levels depending on the type of tax. The national government contracts with the regional and local governments the part of the national taxes to be transferred, which may be increased by extra regional or local rates. Besides, some taxes (e.g. property taxes) are wholly managed by the local or regional governments. The legislative power is vested at the Parliament, according to the Constitution. Draft bills emanate from the Ministry with the responsibility for the matter in question. The bills are debated at the relevant Parliamentary Committees.
- (ii) *prevailing framework for pricing in the inter-sectoral context.* The regional government can increase or decrease fuel tax within a 3% range. It is possible to differentiate car taxes, but only at the level of province.
- (iii) *relationships between the key organisations/institutions* The Parliament and the local governments must be consulted before modifying the fiscal policy. Usually, the interest groups are consulted only informally.
- (iv) *barriers to marginal cost-based pricing.* Fuel taxation would require more fiscal decentralisation if it were to be possible for the local governments to decide on the tax level.

Madrid

- (i) *prevailing legal and institutional frameworks in the inter-sectoral context.* Most taxation powers rest with national government. The regional government is not so powerful in terms of taxing, but is increasing its competences within the framework of power devolution to the regions. The municipalities have restricted taxing powers. The legislative power is vested at the Parliament, according to the Constitution. Draft bills emanate from the Ministry with the responsibility for the matter in question. The bills are debated at the respective Parliamentary Committees.

- (ii) *prevailing framework for pricing in the inter-sectoral context.* The revenues from fuel taxes go to general national governmental funds, and are used for covering general national needs. Hypothecation of taxes is not possible.
- (iii) *relationships between the key organisations/institutions.* The Parliament and the local governments must be consulted before modifying the fiscal policy. Usually, the interest groups are consulted only informally.
- (iv) *barriers to marginal cost-based pricing.* Increasing fuel taxation is perceived to be politically unrealistic. However, a few minor measures, such as creating duties on fuel stations, could be devised to increase (indirectly) the taxes taken on fuel. There are no legislative barriers to differentiating road vehicle taxes by area, although this is not being considered at present.

Summary & conclusions

Following the format adopted in previous sections, the summary discussion is subdivided under three headings: (i) legal and institutional frameworks for pricing transport in the inter-sectoral context, (ii) institutional relationships affecting transport pricing policy in the inter-sectoral context and (iii) barriers to marginal cost-based pricing for transport in the spatial context.

(i) legal and institutional frameworks for pricing transport in the inter-sectoral context

74. General taxation policy is generally found to be predominantly the responsibility of national government and national transport taxation (e.g. fuel taxes and road vehicle licenses) has traditionally been based on general fiscal principles, raising money for the national treasury. However, local (and, in some cases, regional) institutions do have some limited taxation powers (e.g. levying local property-based taxes and parking charges, sometimes varying the levels of national taxes to a limited extent).

(ii) institutional relationships affecting transport pricing policy in the inter-sectoral context

75. The key *institutional relationships* are those between different levels of government. National governments naturally wish to retain control over taxation policies and ensure that they receive the majority of total revenues, while local government agencies wish to ensure that the benefits resulting from taxes paid locally are perceived within the area. As a result, inter-sectoral revenue transfers are always likely to prove politically contentious. This needs to be addressed as part of second-best analysis.

(iii) barriers to marginal cost-based pricing

76. Existing taxation regimes which traditionally raise revenue for national government are unlikely to be altered in the short-run. However, as transport problems have moved up the political agenda, there seems to be a greater willingness in government to alter the basis on which transport related taxes are decided, provided that:

- existing revenue streams are not significantly adversely affected; and
- the new taxation approach is not perceived to be politically unacceptable.

77. Distortions in other economic sectors are inevitable and influencing them is likely to be beyond the scope of even the broadest consideration of transport pricing policy at present. Therefore, any attempt at significant changes in urban transport pricing will need to consider carefully the nature and scale of these distortions as part of the second-best situation. In particular, it may be most important to focus on distortions which may be expected to impact on the welfare of lower socio-economic groups and result in social exclusion.

7.5 Synthesis

78. Overall, it is probably true to suggest that the progression through the four settings, towards a broader analysis, results in greater potential for complexity and barriers that seem difficult to overcome. The one respect in which this may not hold is the shift in focus from short-run to long-run issues, which takes place in parallel. In this case, a focus on the long-run may actually imply rather simpler levels of differentiation (albeit in broader application) and, therefore, rather less reliance on introducing electronic charging technologies.

79. While it is apparent that urban transport policy innovations are being considered in a number of European states towards the ability to levy more direct charges for road use, much less is being done towards new pricing regimes in the multi-modal, spatial and geographical, and inter-sectoral settings. However, even where policy innovations are being considered and transport demand management goals represent a significant motivation, it is clear that the practical solutions envisaged are some way removed from marginal cost pricing principles.

80. An extremely important issue which helps to explain this is that, in general, real-world policy-makers remain unconvinced that marginal cost-based pricing approaches are both feasible and desirable in practice. In particular, policy-makers come from a wide range of core discipline backgrounds, many of which advocate significantly different perspectives to those put forward by welfare economics. Thus, as the traditional practical pricing and decision-making culture in transport (and many other sectors) is not immediately consistent with marginal cost pricing approaches, there is an undeniable tendency for policy-makers to dismiss arguments of theoretical efficiency as an academic irrelevance.

8 Legal and institutional barriers to specific marginal cost-based policy packages

Section 7 reviewed the prevailing legal and institutional frameworks affecting urban transport pricing and assessed the potential for implementing marginal cost-based pricing policies across the EU, with particular reference to a series of case studies (Athens, Edinburgh, Helsinki, Lombardy and Madrid). The main goal was to identify and analyse existing barriers to such pricing policies. This section extends the analysis of further, focussing on marginal cost-based policy packages.

81. Besides individual pricing measures, the case studies analysed legal and institutional issues (frameworks, barriers) from the viewpoint of marginal cost-based policy packages. More specifically, two policy packages, the so-called weak and strong package, originally defined in AFFORD Deliverable 1 were assessed. The former package assumes relatively low charges and earmarked revenue use. The latter was labelled in Deliverable 1 as the best practice second-best package. It assumes relatively high charges and that much of the revenues are not earmarked but are used to lower labour taxes. The weak package is, thus, especially relevant in a spatial and geographical context (setting 3); the strong package when covering inter-sectoral aspects (setting 4).

Section 8.1 considers the weak package, and section 8.2 the strong package. Section 8.3 summarises.

8.1 Weak or acceptable package – low charges with earmarked revenue use

82. The *weak or acceptable package* assumes relatively low charges and earmarked revenue use. The package assumes that:

- *parking charges are increased by 0.25 euro/hour, with a fixed tariff of 1 euro plus taxes on fuel increased by 0.1 euro/litre, while the revenues are allocated as follows: 1/3 to increase road capacity and/or increase parking space, 1/3 to reduce car taxes, and 1/3 to reduce public transport tariffs and/or provide more facilities to cyclists and pedestrians.*

The results of the questionnaire and related discussions with representatives of the case study locations are summarised below, by city, split by the *charging* and *redistribution* elements of the policy where appropriate.

Athens

- *Charging & Redistribution:* There are no legal or institutional barriers to the implementation of the package. However, a legal framework specifying all the details for the introduction of the package would be necessary. Agreements between relevant institutions about responsibilities would need to be determined. It was stated that increases in parking charges and fuel taxes would need to be approved by the national government relating to likely impacts on national inflation.

Edinburgh

- *Charging:* It would be possible to increase parking charges for publicly owned facilities within the city centre. However, this represents only a minority of total capacity. Parking charge levels for commercial parking facilities cannot be controlled and there are currently no powers to charge for privately owned residential and business spaces. The proposed *Workplace Parking Levy* (WPL) will allow businesses to be charged for parking space that they currently provide free for use by employees, but it seems unlikely that this cost will be passed on directly to drivers. Also, the WPL will not cover free customer parking. Extending charges for on-street parking beyond the immediate city centre is difficult to enforce and can prove unpopular with residents and business, so the geographical scope of the policy tends to rather limited at the city wide level. New legislation to allow local government agencies greater formal control over private car park operators would be well received by local policy-makers and it is perceived that it would help the effectiveness of city centre parking policies. Such legislation is not believed to be likely in the near future. Modifications to fuel tax levels can only be made by national government and this element of the package was, therefore, considered to be beyond the scope of the policy-makers who are responsible for urban transport pricing. However, the future possibility that the new Scottish Parliament might seek to vary national road transport tax levels to some extent cannot be completely discounted.
- *Redistribution:* All revenues from existing local parking charges must be used for local transport purposes and the proposed legislation to introduce the WPL includes a stipulation that all revenues will be retained locally and hypothecated to transport issues for at least the first ten years of operation. Therefore, use of charge revenues to increase local road and parking capacity and to improve facilities for cyclists and pedestrians would both be possible. However, it was considered more likely that revenue redistributed to the road transport sector would be used to improve the quality and management of existing capacity rather than to expand it, except, perhaps, for a small number of specific projects. Revenues redistributed to public transport would probably need to be used for investment in infrastructure to improve quality and information for existing services or to invest in completely new public transport innovations, because the current arrangements for services to be operated competitively by private operators does not permit widespread subsidisation of fares. It would not be possible to use revenues to reduce existing national road taxes, because this falls beyond the scope of the institutions responsible for urban transport pricing policy. Local policy-makers would vigorously oppose any transfer of revenues outside the local area for redistribution by national government, but would, in the long-run, be prepared to redistribute revenues through reduced local property taxes or increased investment in non-transport services (e.g. health and education) if the national restriction that all revenue must be spent within the transport sector was to be relaxed.

Helsinki

- *Charging:* Municipal parking charges (as opposed to private ones) could be changed by the city councils and the petrol taxation by the government but this would imply a national policy implications.
- *Redistribution:* The structure and justification of tax systems and financing does not currently support an earmarked tax by the current institutions. There are no imminent plans to remove any barriers between institutions, although even major changes in institutions were not considered a serious problem assuming a political will would exist.

Lombardy

- *Charging & Redistribution:* The package is potentially feasible, but it would be necessary to strengthen tax decentralisation in a way that makes it possible for local government to decide on the level of fuel taxation, depending on levels of congestion and pollution, and to invest the money raised in capacity expansion of roads and parking and in subsidies to public transport. Otherwise, extremely complex negotiations would be needed between the local municipalities and the Region (to reduce public transport fares) and between the Provinces and the national government (to lower road transport taxes).

Madrid

- *Charging:* Raising fuel tax would be feasible for the national government. However, it is not possible for local government to increase charges for publicly owned and operated parking, because legislation states that these parking fees prices must be based on costs of operation and that total

revenues cannot exceed costs. Also, even if increases in public parking fees was allowed, there would still be no control over fees charged in privately owned parking lots, which have price freedom defended by the Constitution. Therefore, public parking lots would not be competitive with privately owned ones. The only possibility for raising the actual prices charged for all parking would be through specific duties charged on parking operations and/or prices. However, any such measures would be open to legal challenge in the courts and would have no guarantee of success.

- *Redistribution:* In Spain, it is not possible to allocate fiscal revenues to any predefined expenditures. However, it may be possible to by-pass this fundamental problem by using the annual budget of all institutions involved to allocate the desired amount to particular functions. In theory, this could be done for the amount as the expected revenues from the package, but it would need to be approved on an annual basis, requiring a new political agreement each time, and, therefore, could not be guaranteed in the long-run. Redistribution of revenues to reduce road taxes would help to overcome opposition that would be expected to any increase in the costs of road use from the car lobby. Therefore, it is possible that acceptability would not be a critical barrier.

8.2 Strong or best practice second-best package – high charges with revenues used to lower labour taxes

83. The *strong or best practice second-best package* assumes relatively high charges and that much of the revenues are used to lower labour taxes (i.e. without hypothecation to specific uses). The package assumes that:

- *parking charges are increased by 0.5 euro/hour, taxes on fuel are increased by 0.5 euro/litre and a cordon toll of 2 euro in peak hour (7:00 to 9:00 a.m.) and 0,5 euro/hour out of this period, whereas the revenues are allocated as follows: 1/3 to increase road capacity and 2/3 to reduce labour taxes.*

As in section 8.1, the results of the questionnaire and related discussions with representatives of the case study locations are summarised below, by city, split by the *charging* and *redistribution* elements of the policy where appropriate.

Athens

- *Charging & Redistribution:* It would be necessary to introduce of a legal & institutional framework that would clearly state all issues regarding road pricing. It was noted that this strategy calls for higher co-ordination effort than the weak package. In particular, toll cordon charges in conjunction with parking charges would necessitate extra collaboration between the municipalities and the institutions that would run the whole scheme. Also, in this case, the approval of the national government with respect to the introduction of increases in parking fees and fuel taxes would need to be attained, related to potential inflationary effects, as for the weak package.

Edinburgh

- *Charging:* Although not permitted at present, a road pricing toll cordon is likely to be perfectly possible under the proposed legislation. Such a measure has been considered by local policy-makers for a number of years and is considered quite likely to be implemented. The same issues affect modifications to parking charges and fuel taxation as stated for the weak package. Some concern was expressed regarding a package which attempts to raise charges for parking and fuel in addition to introducing road pricing. It was considered that this would be unacceptable to the public and that it was more likely that other road transport pricing measures (e.g. parking charges within the toll cordon) would need to be reduced to win support for road pricing.
- *Redistribution:* Using revenues for capacity expansion in the urban transport sector is certainly possible, but the fact that the package focuses solely on road capacity would certainly meet opposition from both national and local government policy-makers. Using locally collected transport revenues to reduce nationally levied labour taxes is not an option at all. As for the weak package,

local policy-makers would vigorously oppose any transfer of revenues out of local control. In addition, national government has already agreed the principle that road pricing revenues should be hypothecated to uses within the local transport sector for a minimum of ten years. It was considered that the principle of hypothecation was recognised as essential by both local and national government to ensure public acceptance of new taxation policies. Therefore, even though it was considered that, in the long-run, a proportion of revenues from road pricing would be redistributed outside the transport sector and, potentially, transferred to national government, it was thought extremely unlikely that it would ever be allowed to be free from all hypothecation and, thus, be available to reduce labour taxes.

Helsinki

- *Charging & Redistribution:* Policy-makers did not feel able to comment upon the strong package in detail, because its effects were considered to be somewhat unknown. The Finnish institutions are generally very pragmatic and not keen to consider hypothetical cases (such as a cordon toll, which is not permitted under current legislation), because there is a long tradition of policy-making through negotiations to reach a consensus among all relevant institutions. Furthermore, institutions do not generally consider details of legislative and organisational requirements before there is an explicit need to do so, as a result of political decisions. In this case, the institutional status was considered 'before strategic level' and addressing issues related to legal and institutional barriers was thought to be premature. In particular, it was suggested that ongoing technological advancements in telematics and satellite navigation systems would be likely to affect implementation issues and resolve many things that may currently appear as barriers within a realistic timeframe. The drawback of this approach is that situations of *institutional gridlock* could occur, implying that key institutions may not provide enough information for political policy-makers to consider strategic decisions for the institutions themselves to start acting upon!

Lombardy

- *Charging & Redistribution:* The charging elements of the package will become feasible once the ongoing introduction of a legal framework to enable road pricing has been completed. However, the complexity of negotiations that would be required between local municipalities and the national government to allow revenues to be used to lower labour taxes would be a major problem and could fail.

Madrid

- *Charging & Redistribution:* The redistribution elements of the package were considered completely infeasible, due to the important implications it would have for the general national taxation system. The efficiency of urban transport pricing was considered a far too narrow objective to justify such far reaching consequences for national taxation.

8.3 Summary & conclusions

84. It was, in general, expected that the barriers to the strong package would be perceived to be rather greater than to the weak one. This proved to be so in the case studies. In particular, the redistribution element of the strong package met with both legislative barriers and considerable hostility from the representatives of key institutions, as a result of the suggestion that urban transport pricing revenues should be used to lower national labour taxes.

85. The overall implication of this may be that a combination of (public and political) acceptability and institutional barriers will, in most situations, dictate that a significant majority of revenues levied at the local or regional level may also need to be redistributed at that level, for the perceived benefit of the population which pays, regardless of whether or not the funds are used for transport.

86. In addition, it is clear that the principle of hypothecation is quite politically sensitive. In some environments, it is viewed as an important mechanism to improve the acceptability of taxation, while elsewhere it is explicitly forbidden. Such strong attitudes are unlikely to be reversed (or, indeed, unified across Europe) for urban transport pricing objectives alone.

The road pricing element of the strong package appeared to receive a more positive reaction from policy-makers than might initially have been expected. This testifies to the degree of effort that has recently been expended within this area. However, the view of the Finnish policy-makers points very effectively to the fact that not all nations perceive the same problems related to urban transport and, thus, urban transport pricing solutions.

The use of a range of pricing measures in combination for charging road transport, most apparent in the strong package, raises some important acceptability issues. Just as drivers might expect road pricing to be introduced alongside reductions to national vehicle taxation, so they might also expect similar compensation to exist, at least in principle, for parking charges and fuel taxation. Indeed, the public and business protests regarding prevailing levels of fuel tax, that have taken place across Europe since the case study interviews were completed, may suggest that any attempt to introduce road pricing in the foreseeable future may need to be presented as a more sophisticated (and, thus, differentiated) alternative to high fuel taxes. Therefore, it may actually be necessary to cut fuel tax, at least as an initial gesture.

87. Viewed broadly, the key issue from an acceptability viewpoint may be the difference between a package of pricing-based policy-measures which present drivers with a cost trade-off between different travel options (e.g. between paying a particular unit of fuel tax wherever they go, or paying a higher road pricing charge only when they enter the most congested areas of the city) and a package which appears to make all aspects of road use more expensive at the same time. Of course, such issues are most critical at the point of implementation and it may be possible to achieve the full range of proposed measures over time, as part of a phased approach.

88. In conclusion, the two packages considered in this study have served their purpose in pointing to a number of important issues that were not apparent from considering individual marginal cost-based pricing measures separately. However, taken at face value, neither has been shown to be widely successful from a legal and institutional viewpoint.

9 Needs and prospects for institutional reform

Sections 6 to 8 have considered legal and institutional barriers to the implementation of marginal cost-based pricing in practice, focusing on five case studies (Athens, Edinburgh, Helsinki, Lombardy and Madrid) and the Randstad area of The Netherlands, but attempting to draw general conclusions wherever possible.

This section assesses the needs and prospects for institutional reform against the (types of) barriers identified and provides some thoughts regarding potential legal and institutional scenarios for implementing marginal cost pricing (institutional implementation models). The discussion draws on the major conclusions of the empirical sections (6-8) and evaluates them against the various theoretical dimensions, presented earlier (in sections 3-5). However, no in-depth analysis of such institutional reform issues is possible here, so the conclusions and suggestions made should be considered extremely tentative only.

Section 9.1 considers the most obvious and important needs for institutional reform in the marginal cost pricing context. Section 9.2 considers the potential mechanisms of and the prospects for institutional reform with respect to different types of barriers, drawing on section 4.4, above, which identified three categories of barrier (structural barriers, interest groups against marginal cost pricing, and low socio-political acceptability). Finally, section 9.3 discusses briefly potential institutional implementation models.

9.1 The needs for institutional reform

89. The conceptual and empirical analyses of this study have been driven by the goal of identifying the most important legal and institutional barriers to marginal cost-based pricing in urban transport. An important question following this concerns the requirements for institutional reform with respect to these barriers.

This section will synthesise the previous discussions, to summarise the most obvious and important needs for such reform. The discussion will focus on the work undertaken within the AFFORD case studies and the additional example of the Randstad area, but will attempt to draw general conclusions covering all member states of the EU and beyond, wherever possible.

Structural barriers

Structural barriers are defined as those issues which relate to the laws and structures of government institutions and their policies. As stated in section 4.3, such barriers may be caused by:

- (i) inappropriate or non-optimal organisational structures to facilitate marginal cost-based pricing and associated charging and redistribution mechanisms;

- (ii) insufficient legislation to support marginal cost-based pricing and associated charging and redistribution mechanisms, including some laws which may even appear to support contradictory objectives and/or to prevent certain measures explicitly; and
- (iii) prevailing economic and/or transport-related policies at national level which appear to be in contradiction with marginal cost pricing principles, at least in the context of the local urban transport pricing environment.

From the AFFORD case studies it is clear that there are barriers in all three areas.

90. Regarding *organisational structures*, it is clear that the existing arrangements for urban transport may be far more complex and disaggregate than would be desirable for implementing a comprehensive multi-modal transport pricing system across an urban region, in many European situations. In particular, it is common for urban transport to fall within the responsibility brief of local government agencies, implying that any coherent transport policy for the full urban region will require a consensus to be agreed among representatives of a number of geographically separate units who are accountable to different electorates.

91. Also, there is a strong precedent towards arrangements under which the traditional approaches for managing different travel modes have largely been separate. So, typically, the institutions responsible for providing and operating public transport services play little, or no, role in private road transport (and vice versa) and their pricing policy objectives may be unrelated. Therefore, the process of putting together a consortium of institutions that would need to co-operate for a successful, comprehensive multi-modal urban transport pricing system to be introduced might result in such a large group with such disparate interests that the prospect of effective implementation would be greatly reduced. At present, the impact of this is best gauged by proposals to introduce road pricing schemes, which have, in general, attempted to side-step institutional complexity by constraining the areas affected to very compact city centres. The corollary is that the resulting road pricing systems may be expected to have only a very small impact on city-wide travelling.

92. A separate dimension, related to organisational structures, is that of different levels of government. Here, the precedent is quite clearly for detailed urban transport issues and implementations to be dealt with at the local and/or regional level, while inter-urban transport and general strategic transport policy-making is normally the responsibility of national government. It is also important to acknowledge the difference between capital and provincial cities, because the former tend to receive more involvement at the detailed urban level from national government.

93. From a transport pricing viewpoint, the key barriers relate to:

- (a) the politics of the general financial relationships between different government levels (which may involve complex arguments and power struggles overriding issues of ideology); and

(b) the prevailing precedent for pricing road transport (which typically involves annual licensing of vehicles and duty on the purchase of fuel, both of which provide significant unhypothecated revenues to general national funds).

Any major change in existing revenue streams and money flows between government levels would, almost inevitably, result in conflicts based on the perceived changes in the balance of power they implied. In addition, national governments might be expected to oppose vigorously any significant reductions in revenues from existing transport taxation, or any attempts to constrain how it might be spent and/or redistributed, on both political and budgetary grounds.

94. With regard to prevailing *legislation*, there may be two key strands:

- (a) laws governing the structures of institutions and the relationships between them (relating to the organisational issues discussed above); and
- (b) laws required to support specific marginal cost-based pricing measures which are not currently operational (in an appropriate form to encourage efficiency).

For example, laws which provide for the competitive operation of privately owned urban public transport services will have an important impact for both the potential number (and nature) of institutions that would need to be included within a multi-modal transport pricing system and for the degree of control that government agencies can exert over user fares. Also, marginal cost-based pricing for road use might, ideally, require levels of differentiation between users that could only feasibly be applied by advanced electronic charging technology, which would, in turn, need supporting legislation to regulate use and safeguard both the rights of users and the credibility of the system. Indeed, in some instances prevailing legislation relating to civil liberties may hinder the enforcement of electronic systems, by restricting the power to collect and use electronic data.

95. At a more general level, it is, perhaps, worth making the point that, although there is no shortage of examples of current national legislation to state that user prices for certain elements of urban transport should be based on competitive commercial principles (e.g. U.K. bus fares) or on a non-profit cost coverage approach (e.g. publicly operated parking in Madrid), the authors are aware of no current examples of national legislation to state that any element of urban transport pricing should be based explicitly on marginal cost approaches!

96. In the light of these observations, it can come as no surprise that prevailing *national policies* – economic and/or transport-related – in the EU are, typically, contradictory to marginal cost pricing principles for urban transport. In most cases, the main policies towards public transport pricing appear to be motivated by the desires to cover service costs and encourage usage, while those towards pricing road transport appear to be motivated, separately, by the desire to raise revenues. In the case of urban public transport, the focus tends to be on providing an efficient service to support the economic health of the city and on addressing equity concerns for the poorer and less mobile members of society. In the case of private road transport, there is, typically, a balance between competing objectives of reducing the perceived congestion and environmental impacts of traffic growth, while accommodating existing mobility levels (to avoid negative impacts for the urban economy).

97. However, in recent years, policies which attempt to develop integrated approaches to urban transport have become more popular and tend to view increasing the cost of road use as a mechanism both for restraining growth in road use and acquiring resources for improving the public transport alternatives (i.e. a carrot and stick approach). While not wholly inconsistent with efficiency principles, there are, nevertheless, respects in which these policy-making approaches are, in practice, contradictory to marginal cost-based pricing. In particular: (a) any resulting user pricing would probably be decided more on the basis of politically acceptable unit charges which would provide revenue streams sufficient to fund particular projects, not on calculations of external costs; and (b) revenues generated within the urban transport sector are most likely to be redistributed there, providing alternatives to road travel but attempting to support (and, perhaps, even increase) current mobility levels.

98. Thus, in those situations where innovative approaches for pricing road use, such as road pricing, are being considered, policy-makers tend to favour very simple charging systems with very limited differentiation and hypothecation of revenues to significant urban transport investment packages, including new road infrastructure, new public transport modes, improved infrastructure for existing public transport services etc.

Opposition from interest groups

Barriers related to opposition from interest groups relate to non-governmental actors and/or organisations with a perceived stake in the urban transport system, who deliberately oppose marginal cost-based policies and measures. Reasons for their opposition might include perceptions of:

- (i) insufficient communication regarding the objectives and potential benefits (and dangers) of marginal cost-based pricing policies;
- (ii) distributional issues regarding precisely who wins and who loses; and
- (iii) insufficient effort and resources to cater for and, perhaps, compensate those who might expect to be worse off as a result of marginal cost-based urban transport pricing policies.

99. Regarding issues of *communication*, the key problem may be that the theoretical basis for marginal cost pricing involves some rather complex economic concepts that are neither common within public understanding of urban transport issues nor, necessarily, shared and valued by all other relevant academic disciplines. Therefore, perceptions of marginal cost pricing are affected by a lack of knowledge and/or consensus within the majority of (government and interest group-based) institutions at all levels, throughout the EU.

100. In the academic and conceptual policy-making community, the basic principles of welfare economics are generally embraced (either explicitly or implicitly), but there is rather less agreement on the specific issues relating to the role of marginal cost pricing approaches in practical policy-making. In particular, while most people appear to accept the validity of first-best pricing as a useful theoretical benchmark for textbook illustrations of transport efficiency, there are still widely varying opinions of how this

very simple theory is affected by the collapse of many of its supporting assumptions in the (second-best) real world.

101. From the AFFORD case studies, it is absolutely clear that the majority of policy-makers involved in urban transport pricing at all levels are not, primarily, motivated by a commitment to marginal cost-based approaches and are, in many cases, sceptical of the applicability of the detailed economic theory to the real world urban environments. In some cases, this scepticism may be attributed directly to issues raised within the academic community, in others it may be based more on the lack of clear compatibility between theoretical academic concepts and pragmatic policy-making concerns (e.g. addressing issues of social equity and acceptability).

The public perception may be more difficult to characterise in general terms, as there are, potentially, many different viewpoints. However, the key point to acknowledge may be that public views are likely to be at the most pragmatic and disaggregate level, based on what people believe the impacts of a marginal cost pricing-based policy might mean for their own lives and others like them. The experience that exists in this area to date (e.g. the Randstad case), suggests that people may be suspicious of what they perceive to be clever arguments which are not obviously compatible with their own personal pragmatic perspectives, especially where the outcome would apparently be to levy greater levels of taxation. In general, it may be fair to say that the public in many European countries currently have limited trust in government, particularly related to financial issues and, therefore, they are likely to be sceptical of arguments which suggest that increasing taxation could (or would) be used to improve the welfare of society as a whole. An important aspect of this view may be a perception in which equity issues (i.e. who wins and who loses as the result of a policy) takes the primary role, ahead of total welfare. A guaranteed, transparent hypothecation of revenues collected may be the only way to overcome this, because it would help to specify the winners and losers in detail and facilitate negotiations to alleviate specific concerns. In addition, there is evidence that the public view may be very conservative in policy terms (as characterised by the phrase 'better the devil you know than the one you don't!'). So, they may need to see proof that marginal cost pricing will work as its academic advocates have suggested before being prepared to give 'consent' for it to be used in their own urban areas. Existing levels of congestion and environmental impacts resulting from traffic growth are, undoubtedly, unpopular, but a policy which would increase travel costs (and, thus, perhaps, reduce the freedom of mobility) and affect the overall urban economy in ways that are yet to be fully understood is still likely to meet considerable resistance.

Considering these three major interest group areas leads to the possibility of a further communication problem for politicians (and the practical policy-makers who support them), who are put in the position of needing to make strategic policy decisions which take account of both the academic and public perspectives. There is a danger that the key individuals, institutions and interest groups who are responsible for real-world policy-making will receive very different and largely incompatible messages from the academic community and from public interest groups, neither of which sufficiently acknowledges the concerns of the other. In such a situation, it cannot be surprising if

progress towards implementation of the policy (even on merely an experimental basis) is extremely slow and difficult.

Regarding *distributional* issues, it may be a weakness of existing economic (and other academic) analyses that insufficient effort has been expended in this area. While very basic distributional issues relating to the fact that different users may be expected to have different values of time and money have been considered, the full complexity of real world environments, including continuous variations in financial wealth, quality of life and spatial context have largely been omitted. Addressing this at the most disaggregate levels, to identify variations between individuals and point towards best and worst cases which may need to be considered for special treatment, is probably the only way forward towards mitigating opposition on distributional grounds.

This relates closely to issues of *compensation* (financial or otherwise). Once key losers have been identified at a disaggregate level, it seems likely that policy actions to assist them (particularly during the short-run transitional phase after implementation) would need to be addressed at the same levels of detail. This might be expected to involve significant implications for the (short-run) redistribution of revenue generated by new urban transport pricing schemes, another area which has, to date, received too little attention (leading to insufficient consensus) within the academic community.

Considering interest groups at a more detailed level, many different viewpoints (and associated actors / institutions) could be included. A brief summary of the key players may look something like:

- the academic and conceptual policy-making community, represented by prominent individual actors and professional transport policy-making bodies; the main advocates in favour of marginal cost pricing, but, as stated above, their support is not unanimous; primarily influential on strategic policy-makers;
- the business community, typically represented by local Chambers of Commerce; in favour of finding solutions to traffic congestion, as a result of the additional costs it imposes on them, but not guaranteed to agree that marginal cost pricing is the best (or only) appropriate way to do it (in the U.K., some business organisations have been supportive of city centre road pricing proposals, but in the Netherlands they saw the best solution as additional road space, funded from the general national budget); may be concerned primarily with short-run impacts; one of the most important influences on local policy-making;
- employees organisations, such as traditional workers' unions; likely to be concerned mainly with the equity issues affecting their members; may be concerned primarily with short-run impacts, particularly where some people appear to be made significantly worse off; potentially an important influence on national policy-making, but their effective power varies between states;
- motoring organisations, comprising institutions with a financial stake in the road transport sector (e.g. organisations which represent the road haulage industry), car clubs (e.g. traditional automobile associations, such as the A.A. in the UK and the A.N.W.B. in The Netherlands) and associated political pressure groups; likely to oppose any increase in the costs of road use, unless they perceive benefits related to the recycling of all funds within the road sector; likely to be

concerned primarily with the short-run perspective; potentially an important influence on national policy-making;

- public transport organisations, such as institutions which represent operators and consumer groups which represent the interests of passengers; opposing views always potentially likely from groups representing operators and those representing passengers, particularly in situations where the operators are privately owned and profit motivated; may be united in support for any policy which redistributes funds generated in the road transport sector towards public transport; both may oppose government control of public transport fares to represent marginal costs (assuming that would, typically, result in rising fares), but the reasons may be very different; again, short-run issues may be dominant, although not in the case of all consumer groups; equity always likely to be the key focus of consumer groups; potentially important influence on national policy-making, particularly related to public transport policies;
- the media, including all publicly available newspapers, magazines, radio and television; have a vested interest in exposing instances where government policies and actions may conflict with public opinions, both from the viewpoint of public information ideology and (where appropriate) commercial success from attracting the maximum audience; not necessarily allied to any particular ideology regarding transport policy (and may even change sides over time), but likely to be interested primarily in the short-run equity perspective, because of its emotive human quality; exists at different geographical levels (e.g. national, regional and local) and potentially likely to be a major influence on policy-making at the appropriate level.

This very general analysis suggests that the majority of interest groups would currently oppose marginal cost pricing policies for urban transport, with the issues of concern regarding short-run impacts and equity playing a major role. Although some groups are always likely to be in opposition, regardless of the actions of researchers and policy-makers, it is possible that the overall balance of opinion among interest groups could be changed through a focus of effort and resources on these key areas.

Low socio-political acceptability

The low socio-political acceptability of marginal cost-based transport pricing is manifested in the behaviour of politicians and government organisations, through their general failure to move towards (at least) experimental implementation, at all levels of government but, particularly, in the local urban context. It may reflect that:

- (i) marginal cost pricing has not been accepted universally, either by economists or among other relevant academic disciplines;
- (ii) politicians and civil servants representing the relevant organisations are not sufficiently familiar with or convinced by the principles (and potential practice) of marginal cost pricing;
- (iii) tensions between the local and national levels of government;
- (iv) the need for local governments to justify their policies in terms of practical (pragmatic) and often detailed arguments rather than in terms of referring to

- more general economic efficiency and equity benefits, which are the main criteria emphasised in the context of marginal cost pricing;
- (v) the competition between different neighbouring local communities; and
 - (vi) the interests of individuals working within government (and other) organisations with a stake in preserving the status quo.

These issues match very closely to many of the points raised above under structural barriers and opposition from interest groups, illustrating the extent to which the different barrier dimensions are so clearly interrelated. In general, socio-political acceptability issues do not appear to be independent and self-supporting, but relate instead to other tangible barriers that have not been resolved sufficiently. From this viewpoint, lack of socio-political acceptability in a democratic environment, where politicians and policy-makers can be held accountable for their actions, may be considered the most powerful barrier to implementation of any new policy measure. It is also, by definition, a barrier that should always have the potential to be changed. However, approaches which focus on acceptability as a wholly independent concept, which, for example, might attempt to improve the popularity of proposed policies through awareness campaigns and advertising, may be destined to fail because they do not address the underlying issues. Therefore, from both an academic and a policy-making viewpoint, it is probably most important to focus on the structural and interest group related barriers which contribute most to socio-political acceptability problems, rather than on the pure acceptability issues themselves.

9.2 Prospects for and mechanisms of institutional reform

9.2.1 In relation to structural barriers

102. Institutional reform to remove structural barriers to marginal cost-based pricing for urban transport may involve:

- (i) consideration of legislation at national level which makes explicit reference to the potential benefits of efficient transport pricing, to influence the underlying themes of strategic policy-making;
- (ii) creation of new institutions and organisational structures designed to facilitate coherent, integrated transport policies and pricing covering whole urban regions;
- (iii) introduction of new legislation to facilitate the implementation of key marginal cost-based pricing measures and supporting technologies; and
- (iv) investigation of the political and financial relationships between transport policy-making institutions at different levels of government, towards removing tensions and inconsistencies (especially between national and local level) that may hinder achievement of the most efficient solutions.

9.2.2 In relation to opposition from interest groups

103. Institutional reform to remove opposition from interest groups may involve:

- (i) improving the effectiveness and of communications between the key interest group areas (academic, practical policy-making and public) regarding the potential benefits and dangers of introducing marginal cost pricing approaches;
- (ii) conducting further research to provide more detailed and reliable analyses of the impacts of practical marginal cost-based urban transport pricing systems, focussing, in particular, on the short run impacts and equity issues that are of such concern to many interest groups; and
- (iii) using the outputs from (ii) as inputs to further research addressing issues relating to how revenues generated should best be redistributed in practice and working subsequently with real-world policy-makers to devise practical approaches to compensation that will bet meet interest group concerns.

9.2.3 In relation to low socio-political acceptability

104. Institutional reform to improve low socio-political acceptability may involve:

- (i) improving the transparency of communication on urban transport pricing issues, particularly in the public domain;
- (ii) involving representatives from a wide range of institutions (including government and interest groups) in open public debate about transport policy in the urban context, to ensure that all views are properly represented and addressed, including (where appropriate) tensions between institutions, towards a consensus in which all major players have a stake; and
- (iii) perhaps most important of all, ensuring that the barriers raised in section 9.2.1 and 9.2.2 are addressed and the potential solutions are input to the overall consensus building process.

105. The issue of transparency of communication is particularly important, as part of developing a wider understanding of the prevailing transport pricing problems and the potential benefits of marginal cost-based solutions. At present, the wide-spread lack of this transparency can often lead to policy-makers attempting to justify marginal cost-based measures, such as road pricing, in rather inaccurate and even spurious terms. Just as Project AFFORD has attempted to bring together the differing viewpoints of the various relevant disciplines within the academic community, so the subsequent challenge for both academics and policy-makers is to bring together the very different theoretical and pragmatic viewpoints within the public socio-political environment.

9.3 Institutional implementation models

106. An extremely important question is whether it is possible to develop, based on the theoretical and empirical considerations of the previous sections, some theoretically sound and realistic views on precisely what policy-makers should be aspiring to. That is, whether it is possible to provide suggestions regarding optimal and feasible *legal and institutional structures* for the implementation of marginal cost pricing – called here simply *institutional implementation models*.

107. Institutional implementation models should consider or include the relevant patterns for institutional reforms in relation to the structural, interest group and low socio-political acceptability related barriers, as outlined above in sections 9.2-9.4.

108. In addition, the institutional implementation models should specify transition paths or migration routes from the current status quo in urban transport pricing towards the best practice second-best situations. The concept of the implementation models or transition paths should cover the following two aspects (which of course are highly interlinked):

- (i) the legal and institutional preconditions (barriers, reforms, processes) for the implementation of marginal cost-based pricing; and
- (ii) a detailed description of the content or substance of marginal cost-based pricing (individual measures, policy packages).

Transition paths should distinguish between optimal and feasible implementation strategies, both in the short-run and the long-run (e.g. legislation to facilitate road pricing as opposed to actions to restructure institutions throughout the transport sector or even beyond). Questions which will need to be considered include: (a) should demonstration projects and experiments be applied on a large scale, or would an integral implementation be better? (b) should the implementation path be slow and markedly piecemeal, or should it aim to a once-and-for-all solution? (c) what are the pros and cons of each possible approach? and (d) what are the likely realistic timescales for implementation and for the institutional reforms (where needed)? Of course, very tentative answers only to these and other similar questions are possible here.

109. Evidently, providing sound policy conclusions regarding the optimal and feasible transition paths and institutional implementation models requires information on (or, at least, rough estimates of) the time profiles of potential welfare effects of alternative scenarios in the short and the long run. Such welfare estimates should provide information on the comparisons between the current situation, the best practice second-best, and the first-best benchmark. Detailed analysis of these issues has been beyond the scope of this AFFORD study.

Prevailing legal and institutional arrangements in the European Union and beyond suggest that some aspects which are critical to the efficient implementation of marginal cost-based pricing policies may be difficult to change, even over a longer timescale. The most important such aspects are: (a) government control of prices throughout the urban transport sector; and (b) recycling revenues extracted locally through national labour taxes. Potential and plausible objectives for institutional reform may, however, include reductions in the number of different organisations involved in urban transport and addressing problems related to geographical boundaries within the extent of the urban transport system.

10 Concluding comments

The legal and institutional barriers are critical to the implementation of marginal cost pricing in real-life. This AFFORD study, focusing on a number of case study environments, has considered such barriers to individual marginal cost based pricing measures and a range of comprehensive and integrated marginal cost pricing-based policy packages.

The goal has been to investigate the existing legal and institutional barriers to marginal cost based pricing policies in the case cities and beyond, however, focusing on the member countries of the EU. Based on these considerations, the study has made suggestions regarding the most obvious and important needs for institutional reform. As far as the authors know, no similar work has been done to date.

This study has developed a theoretically sound approach or framework for addressing the legal and institutional structures/systems and issues and their implications to marginal cost pricing in urban transport. The study has provided a comprehensive classification of the key issues and organisations, and legal and institutional barriers, critical to the application of marginal cost pricing in urban transport, from local to national level (also regional and EU).

The study has combined economic theoretical approach with broader non-economic and practical (pragmatic) considerations. The research strategy has allowed the greatest level of integration between the general theoretical principles implied by the marginal cost pricing concept – and the economic-theoretical foundations behind it – and the specific practical and detailed considerations on which real-world policy decisions often depend. This is a novel achievement of this study.

Section 2 reviewed the existing research. Sections 3-5 described the theoretical background and identified the most important key issues and concepts and dimensions. These sections laid down sound theoretical principles for in-depth analysis of the legal and institutional issues. In particular, a distinction was made between structural barriers and opposition from interest groups as another type of barrier to marginal cost pricing. Socio-political acceptability, which is very closely and transparently related to the legal and institutional barriers and issues, was addressed as a third type of barrier.

Sections 6-8 identified and analysed legal and institutional barriers to the implementation of marginal cost pricing in practice. Legal and institutional structures/systems were also considered more generally.

Considerable overlap exists between legal and institutional issues and political acceptance. One important lesson from this study has been that they should not be addressed independently. (The empirical case studies were much carried out in this way.) Evidently, a single stream of work on legal and institutional issues and acceptance issues would be optimal from a pure research viewpoint.

The empirical content of the analysis was mainly based on the results of case city reports and of a questionnaire. The questionnaire was presented to high rank civil servants, politicians and managers in the case cities (Athens, Edinburgh, Helsinki, Lombardy and Madrid). In addition, first-hand information concerning the Randstadt area in The Netherlands was available.

Section 9 summarised the legal and institutional barriers to marginal cost pricing currently existing. It made conclusions concerning the needs for institutional reform, and discussed the prospects for and mechanisms of such reform.

The approach adopted in this study in principle allows the use of standard economic tools to evaluate the impacts of legal and institutional reform, and to make suggestions about the optimal institutional structure.

111. A major driving force behind any attempt to introduce marginal cost-based pricing should be the welfare benefits that might be available through it. So far, economists and modellers have typically been carrying out analyses focussing on the overall optimal final solution and showing welfare benefits from moving there. Not much is said about the welfare effects related to the intermediate stages of the transition path or institutional implementation model for getting there, in terms of the potential actions for institutional reforms and introduction of specified practical pricing measures and broader policy packages. This reflects the fact that, typically, the existing models do not have the capability of distinguishing between such scenarios.

112. Detailed analysis of the welfare effects related to alternative legal and institutional scenarios or institutional implementation models has been beyond the scope of this AFFORD study too (also the analysis in AFFORD Deliverable 2a were very tentative in this respect). These issues will be investigated in detail (covering all modes and urban and interurban situations) in a forthcoming EU project MC-ICAM.

The existence of various legal and institutional barriers and, in particular, the current low socio-political acceptability of marginal cost pricing, in the case cities and beyond, demonstrates that there still is a long way to go in convincing policy-makers that marginal cost pricing can be a practical solution to urban transport problems in a large scale. Clearly, more consistent message from the academic/research side is needed and is still to come.

To provide a convincing message the research must also allow for the benefits that might be beyond the scope of economic analysis and existing applied models. Also, a challenge to the research is to allow the concerns and viewpoint of the policy-makers at the local level, and to try to understand why they fail to respond in the way research suggests they should. Evidently, an important part of the answer is to make sure and transparent that what the economic and modelling research and academics more generally say fits with the typically more practical set of objectives and background disciplines that policy-makers do have in their minds.

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Annexes

[The Annexes are available on request. Please contact Esko Niskanen, Project AFFORD co-ordinator, VATT, or Oscar Martinez, WP3 Institutional Issues leader, UPM.]

Annex I: A comparison of policies and institutions in Athens, Helsinki, Lombardy and Madrid (by Oscar Martinez et al)

Annex II: Transport and institutions in Athens (by CISR and UPM)

Annex III: Transport and institutions in Helsinki (by LT Con, VATT and UPM)

Annex IV: Transport and institutions in Lombardy (by MIP and UPM)

Annex V: Transport and institutions in Madrid (by UPM)

Annex VI: A review of public transport organisations (by UPM)

Annex VII: Theoretical framework for institutional analysis and change planning (by UPM)

Annex VIII: Collaborators and interviewees (by UPM)

Annex IX: References (by UPM)