

## Efficient pricing in transport – Results from the 4<sup>th</sup> and 5<sup>th</sup> Framework Research Programmes

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### **Why research on transport pricing?**

It has been known since the writings of the French engineer Jules Dupuit in the 19<sup>th</sup> century that marginal cost pricing is efficient and beneficial to the transport system and the economy as a whole. But implementing pricing is a complex issue. In the start of the 4<sup>th</sup> Framework Transport Research Programme in 1996, there was not yet a consensus in the literature on how to operationalise the theoretical concept of marginal cost pricing, advocated in the Commission's green paper *Towards Fair and Efficient Pricing in Transport* (1996) and taken further in the white paper *Fair Payment for Infrastructure Use* (1998). What concrete pricing instruments are most efficient in different contexts and what the appropriate price levels should be were also open questions. In order to have the public and political acceptance for the suggested pricing principles, more knowledge on the impacts – costs and benefits – of pricing and the relationship of pricing to financing was required as well.

Research activities under the 4<sup>th</sup> and 5<sup>th</sup> Framework Programmes look into most of the above mentioned questions and issues. While the FP4 projects have addressed more theoretical issues, such as operationalisation of the marginal cost principle, determination of optimal charging instruments and analysis of small-scale demonstrations, the focus in FP5 has clearly shifted from theory to practical implementation of efficient pricing. There were ten projects dealing with transport pricing in strategic, urban and road sectors in the FP4, for five of them a final report is available whereas the remaining ones are currently being finalised. In the FP5 there are five on-going projects and two under negotiation, managed in units on sectorial economy, clean urban transport and network optimisation of DG TREN.

On the policy side, in parallel to these research activities and drawing from them, the High Level Group on *Infrastructure Charging* has looked at pricing principles, valuation methodologies and means to internalise external costs. The Committee of Government Experts on Transport Infrastructure Charging has launched pilot studies on marginal costs and has been informed about the progress in research.

To ensure wide dissemination of results but also to allow for a debate among practitioners, a concerted action on pricing, **CAPRI** (<http://www.its.leeds.ac.uk/projects/capri/>) was set up in 1998. It aimed at (i) co-ordinating research activities on pricing, (ii) disseminating and discussing the results of FP4 projects with the Member States, and (iii) identifying points of consensus and disagreement. CAPRI organised three meetings and had its final conference in November 1999 in Leuven with more than 100 participants. A thematic network project **IMPRINT-Europe** is being set up as a follow-up to CAPRI. The overall aim of the network is to facilitate a two way process which enables research results to be fed into pricing policy implementation and to inform research about relevant policy questions. In this way it is intended to improve both the quality of policy making and research and to promote consensus by improving

understanding of alternative points of view. IMPRINT-Europe will start early 2001 and last for three years.

In the following, a brief overview of the aims of the FP4 and FP5 pricing research projects is provided and some of the key findings summarised.

### ***How to operationalise the concept of marginal cost pricing?***

There are three research projects with the aim to suggest effective and/or practical ways to implement the marginal cost pricing principle in practice in different contexts. These projects help to identify major distortions in current charging practices and propose corrective measures to be taken. Having the marginal cost pricing theory as a starting point, the projects use modelling techniques in assessing the impacts.

- **TRENEN** (Final report available) is looking for optimal combinations of pricing and regulatory instruments to solve environmental, energy and pure transportation problems in six cities (Amsterdam, Athens, Brussels, Dublin, London and Mestre) and in three regions (Belgium, Ireland and Italy). The TRENEN model maximises a weighted sum of the consumer and producer surpluses, tax revenues and external effects by selecting a set of policies under constraints.

The results indicate that efficient pricing need not be complicated. By correcting for unpaid parking and by implementing a simple cordon toll system to cater for congestion up to 70% of the theoretical optimal benefits can be obtained in cities like London and Brussels. The model results show also that for urban car transport prices should be increased between 70-270% in the peak whereas for inter-urban transport the current charging levels are more or less correct in the off-peak. For public transport efficient pricing means sometimes price reductions (up to -50%) and sometimes increases (up to +60%) depending on the city context and subvention policy.

- **PETS** (Final report in preparation) gives practical advice on how to implement appropriate pricing policies and what the consequences will be in terms of volume of traffic, choice of mode and environmental consequences. The pricing principles are (i) marginal cost pricing, (ii) marginal cost pricing subject to a budget constraint and (iii) full internal and external cost recovery. The project also looks at the relationship between deregulation and pricing. The case studies are Channel crossing, crossing of the Alps, Nordic Triangle and Tagus River crossing.

As to air liberalisation, the results indicate that the effect for consumers has been favourable in terms of prices and seat availability. As to rail the results of privatisation and separation of infrastructure from operations are inconclusive whereas for urban bus transport deregulation has had positive effects on efficiency.

- **AFFORD** (Final report in preparation, <http://www.vatt.fi/afford/>) identifies practical measures to implement marginal cost pricing in urban areas both in the short and long term. The project examines the institutional issues, economic and equity implications and public and political acceptability affecting the implementation of these measures and ways to overcome any identified constraint or

problem. The case study cities are Athens, Dresden, Edinburgh, Helsinki, Oslo and Madrid.

The project also defined such pricing packages that were considered acceptable. It was shown that with charges ranging between 1-5€ for a trip to the city centre considerable improvements in traffic conditions and congestion could be achieved in some of the cities.

*Conclusion 1: Efficient pricing will change the structure of taxes and charges from fixed and blunt measures to more variable ones levied at the point of use. The overall charge levels would not necessarily change. The concept of marginal cost pricing can be translated into concrete pricing or taxation measure using existing technology. Simple “second best” approaches, such as cordon tolls and peak/off-peak price differentiation, can often achieve almost as much as the theoretically optimal solutions.*

### **How to estimate the monetary value of intangibles?**

The DG RESEARCH ExternE project, within the JOULE programme, has studied the health implications of air pollution and noise from both stationary and mobile (transport) sources. It has also looked at the monetary valuation of these damages. This is why the projects financed under transport research programme apply the results of ExternE in different case studies and do not undertake extensive valuation studies. The following four projects look at the costs of transport in different traffic and geographic contexts in more detail:

- **QUITS** (Final report available) used a bottom-up approach to quantify the internal quality and external costs of transport. The study methodology was validated for three multimodal corridors: Frankfurt-Milan, London-Lille, and Munich-Patras.

The results indicate that the level of external costs depends strongly on the route characteristics, number of inhabitants living close to the corridor and on the technology used to produce the electricity used by trains. The external costs per 1000 passenger kilometres vary for rail between 0.79€ (Basle-Como in the Frankfurt-Milan corridor) to 8.59€ (Channel Tunnel-London in the Lille-London corridor), for road between 23.97€(Lille-Channel Tunnel) to 74.68€(Como-Milan), and for air the figure was estimated to be 22€in the Frankfurt-Milan route.

- **FISCUS** (Final report being prepared) has developed a methodology to evaluate total transport costs, both internal and external, in view of comparing costs between public transport and private car use. The research also looks at cost allocation practices in urban areas and identifies feasible and effective means to finance urban transport systems.
- **RECORD-IT** (Start January 2000, end 2001) will complement the QUITs and UNITE research by focusing on the cost structure of intermodal door-to-door freight transport services. The project will develop a methodology for the calculation of real costs, looking at the prices paid by the hauliers as well as the consumption of economic and environmental resources. Special emphasis will be put on identifying costs that occur at the nodal points. The approach will be validated by applying it to

three multi-modal corridors and compare these to unimodal road transport using the same corridors.

- **UNITE** (Start January 2000, end 2002, [www.its.leeds.ac.uk/unite](http://www.its.leeds.ac.uk/unite)) has three interlinked objectives: (i) Development of pilot *transport accounts* that give a clear and transparent overview of the economic and financial flows of the transport system and of the individual modes. The accounts will be compiled for all the EU Member States, Switzerland, Hungary and Estonia as well as for an urban area. (ii) Estimation of *marginal costs* of using the transport system in different local and traffic contexts. The project will undertake 33 case studies covering all relevant external cost categories, modes and Member States. (iii) *Integration* of the accounts and marginal cost approaches and recommendations on how to apply cost figures from one location / case study in another place.

*Conclusion 2: There is enough knowledge on the monetary values of external costs to start with a pricing reform in the transport sector. The remaining gaps are being filled in rapidly by on-going research. In urban areas congestion is becoming the main transport problem and it can represent 90% of all external costs.*

### **What are the impacts of efficient pricing?**

Although the economic theory indicates that efficient pricing will benefit the economy as a whole, more information is needed of the more disaggregate impacts such as changes in traffic volumes, modal split, air quality, noise and accidents. Information on the distribution of impacts, both costs and benefits, is also an important factor in implementing pricing, as it allows to identify potential sufferers and to design mitigation measures when necessary. The following six projects are looking into these questions in detail and use modelling as their approach:

- **TRENEN** (see description above) results show that implementing marginal cost pricing would be beneficial to the society. The welfare gain to the citizens ranges between 0.5-1.3% of the total regional income. Optimal pricing induces reductions in total transport volumes in the urban areas between 7-14% and in the inter-urban between 2-3% on average. In the peak speeds increase by 32-70% in the urban and by 5-12% in the interurban context. External costs of transport reduce by 13-35% in the urban and by 3-5% in the inter-urban areas.

With the current taxation and pricing regime, in 2005 in Amsterdam private cars will account for 68% of all trips in the peak hours while the share of public transport will be 32%. Because of severe congestion the average speed on the roads will be 13 km/h, which is only slightly higher than average speed by bike. Congestion pricing would enable rebalancing of the modes, private car's share would drop to 53% of trips and that of public transport would increase to 47%. The average speed on the roads would increase to 20 km/h.

- **PETS** (see description above). The results for the case studies indicate that the current taxes/prices are on average too high for all modes in the 2010 situation when investments in capacity expansion have been completed. In the table below the impacts of marginal cost pricing as well as of full transport sector cost recovery are

presented for the Nordic Triangle case study. The results indicate that the difference between marginal and average cost prices can be considerable and that marginal cost pricing is likely to fall short of covering investment costs in areas with thin traffic volumes, long distances, low population densities and consequently low external cost levels.

	Car	Bus	Rail	Air	HGV
<b>Marginal cost pricing</b>					
<b>Oslo-Gothenburg</b>					
Necessary change in prices (%)	-7.5	-4.7	-11.6	-12.9	--
Mileage % change	+6.2	-4.4	+0.2	+8.9	--
<b>Turku-Russian border</b>					
Necessary change in prices(%)	-2.0	-28.0	-45.6	--	+14.6
Mileage % change	-1.4	+3.7	+12.1	--	-5.9
<b>Full transport sector cost recovery</b>					
<b>Turku-Russian border</b>					
Change in prices (%)	+11.5	+26.5	+15.7	--	+17.1
Mileage % change	+0.2	-1.3	+0.2	--	-3.4

- **AFFORD** (see description above) Efficient pricing will increase the price of car use especially in the peak periods. Most car users will therefore suffer from the introduction of pricing. The main beneficiaries of pricing is the society as a whole, as congestion and accidents are reduced and the urban environment improves, as well as the city authorities who gain additional revenues. The overall impacts of pricing depend crucially on the use of these revenues. Investments in the transport system can be made to compensate those who suffer and to offer alternatives to car use. On the other hand, by distributing the revenues directly to all citizens either in lump-sum way or by reducing distortive labour taxes everyone can be made better off.
- **TIPMAC, IASON and TranSecon** (start January 2001, end 2003) form a cluster of projects looking at socio-economic impacts of transport policies and infrastructure projects such as the TENs. Efficient pricing is one of the policies looked at and its impacts on traffic conditions, accessibility, environment, employment, regeneration, etc. at macroeconomic, regional and local levels will be assessed.

*Conclusion 3: Efficient pricing is likely to increase prices for car use in congested urban conditions but they could reduce in rural areas. Public transport will become more competitive and need fewer subsidies. As a result of pricing less time is wasted in congestion, there will be fewer accidents and the quality of the environment will improve making the transport system more efficient and the society better off.*

### **Do pricing measures have an impact in real life?**

While projects described under the previous heading look at transport pricing on the aggregate, systemic level, there are four urban and one road sector research projects that look at the implementation of a specific pricing measure in practice. These projects use

partial demonstrations or existing real cases in addition to modelling to gain more detailed and accurate insights into the technological solution and user reactions.

- **TRANSPRICE** (Final report available) addresses a wide range of transport demand management measures (ring tolling, area pricing, parking pricing combined to access restrictions etc.) with an additional emphasis on how pricing should be integrated across a number of transport modes and related facilities. The indicators of success are primarily the efficiency (in terms of how it affects mobility demand and traffic congestion) and public acceptance. The test sites are York, Leeds, Madrid, Athens and Como.
- **CONCERT-P** (Final report available) aims at producing guidelines for the development and implementation of European and local policies on pricing and access restriction, based on the assessment of the efficiency and acceptability of related transport demand management measures (integrated pricing and restraint measures, time-dependant and vehicle-based tolling, pollution-based pricing etc.). Their impact on urban travel behaviour and demand patterns is modelled and evaluated through partial demonstrations in Bologna, Hanover, Marseilles, Dublin, Thessaloniki, Barcelona, Trondheim and Bristol.

The case study results confirm the hypothesis that pricing restraint measures are able to improve the usage of over-subscribed road space, and can persuade a great proportion of motorists to switch to using public transport modes. In Trondheim, increased tolling reduced car use by 6.2% while increasing park and ride by 1.4% and public transport use by 4.2%. The Bristol case indicated that a daily toll combined with free public transport would reduce traffic flows up to 25%.

As to revenues pricing measures provide a new source of income. The tolling system in Trondheim brings in 20 million € yearly as additional revenues and the annual revenues of the planned system for Edinburgh range between 45-80 million €

- **EUROTOLL** (Final report available) validated the potential of pricing measures to combat congestion in 14 cases. The findings indicate that car users, in particular leisure travellers, shift travel times to off-peak or change routes if price differentials provide an incentive to do so. Modal shift or a reduction in the overall number of trips was however found to be negligible. In Leicester, reactions to road pricing on an arterial road combined with P&R and a shuttle bus to the city centre were twofold: a number of trips were shifted to the shuttle, while some of the car users preferred to avoid the charge by using secondary by-pass streets.

*Conclusion 4: Pricing measures are effective in changing people's behaviour and travel patterns. The changes need not be dramatic to have a noticeable effect on the traffic conditions. Car users change timing, route or destination of their trip more readily than mode.*

### ***Can pricing schemes be made acceptable?***

Acceptability, both public and political, has been identified as the main obstacle for implementing marginal cost pricing in practice. Reasons behind opposition to efficient pricing are manifold: the distributional impacts are considerable, the benefits are not obvious to transport users, important behavioural changes might be induced affecting people's daily habits and even location choices. There are three research projects that look at the acceptability issue in detail and define pricing and other policy actions to increase acceptability.

- **AFFORD** (see description above). The politicians perceive the citizens to be more pro-car than they are in reality. The majority of citizens could accept a well-structured package including pricing and other measures in cities where transport problems are perceived to be severe. The role of the media in influencing the discussion and public opinion on road pricing has not been sufficiently considered to date.

For a pricing strategy to be accepted by citizens and business it should comprise of the following elements: (i) the objectives of the strategy have to meet main public concerns as to transport problems, (ii) the proposed strategies have to be perceived as effective solutions to the problems, (iii) revenues must be hypothecated and alternatives provided, (iv) fairness and distribution of costs has to be addressed meaningfully, (v) people must have confidence in the effectiveness of the measures, use of revenues and anonymity of the system, and (vi) there must be an "intelligent" marketing strategy.

- **PRIMA** (final report available) has identified criteria that foster acceptance or result in non-acceptance of urban road pricing schemes by analysing successful cases as well as failures. It was shown that citizens consider road pricing a means of last resort, i.e. traffic problems must be severe and no other way of solving them can be identified. Second, road pricing should be a part of a policy package with clear, simple and transparent content and objectives. Other critical factors for acceptance are: level of charges in the beginning, distribution of effects, availability of alternatives. Adequate communication, including 'adaptive learning' of the public, is crucial for the introduction of a road pricing scheme.
- **PATS** (End date December 2000, <http://www.tis.pt/proj/pats/pats.html>) will, based on an analysis of the reactions and comments to the green and white papers on pricing, define a priori measures to increase the acceptability of marginal cost based pricing in transport. These measures will be tested and enhanced empirically using citizen surveys in six countries and focus group discussions in four countries. The implications of the suggested measures will be assessed using modelling techniques.

Results to date indicate that people are against congestion pricing, as they see themselves victims of a non-functioning transport system, whereas they are more likely to accept pricing to curb environmental damage. There should be clear and transparent information about the use of revenues from pricing, ear-marking will enhance public acceptability. In general, citizens have a more positive attitude

towards efficient pricing than professionals and policy makers in the transport sector.

*Conclusion 5: By making pricing part of a package of policy measures, by offering alternatives to car use and by using the revenues in the most profitable way for the local context, be it in transport or in other sectors, efficient pricing can be acceptable to citizens and business. A “clever” marketing strategy and sound consultation process are crucial for the success of the package.*

### **Financing transport systems and projects**

Efficient pricing based on marginal costs will not necessarily suffice to cover total costs of a project, mode or the transport sector. On the other hand, marginal cost pricing might lead to surpluses in some occasions, notably in congested urban areas. Second, attracting private finance to complement the public funding has turned out to be more difficult than expected in the context of Trans-European transport networks. Research in this field is first looking at the real costs in comparison to charges and taxes paid by different modes, and second aiming at finding effective ways to cover the gap and/or to use the surplus revenues. There are three research projects and one study in this area:

- **FISCUS** (see description above).
- **PROFIT** (Final report being prepared, <http://projects.nei.nl/profit/>) is looking at public-private partnerships for Trans-European Transport Networks. Its aim is to bridge the gap between financial profitability and socio-economic feasibility.
- A study on the **Role of charges and taxes** (final report available) shows that the current regimes in the EU countries comprise a complex mix of fiscal instruments, some providing incentives and others disincentives for sustainable mobility. One reason for this is that many of the charging mechanisms have been developed in order to generate funds, either to finance public transport or for more general purposes. The charges aiming at raising revenues often follow the ‘beneficiary pays’ principle instead of the ‘polluter pays’ principle that underlies marginal cost pricing. The study concludes that there is a need to integrate new charges and taxes with more general fiscal and regulatory instruments to ensure that users are provided with consistent and appropriate prices that reflect the true costs of transport use.
- **UNITE** (see description above) will compile pilot transport accounts that provide information on total and variable costs of the transport system as well as on the revenues collected. The accounts will cover all modes and Member States.

### **Implementation of marginal cost pricing in practice**

It can be said that the more theory oriented research in FP4 has enabled to reach an understanding about how to operationalise marginal cost pricing in practice, what the charge levels in few specific corridors should be and where the major distortions in intermodal competition are. The early FP5 projects are looking yet more closely the costs and charge levels in different contexts and socio-economic impacts of pricing.



What still remains to be looked at is the practical implementation of efficient pricing both at a system and especially at modal levels. There are five projects from the 1<sup>st</sup> and 2<sup>nd</sup> calls of FP5 looking at the concrete implementation of marginal cost pricing across modes and assessing the effects of integrated urban pricing schemes. The projects will analyse the technological solutions, costs and benefits and their distribution among citizens and business, and look more closely at the political and public acceptability.

In parallel with the research, support has also been provided to a number of cities, which intend to implement pricing in the near future, under the so-called EuroPrice network (<http://www.europrice-network.org/>). The network brings together local government authorities to share information about the different strategies, technologies, information campaigns, and investment strategies employed in their efforts to introduce urban road pricing schemes. Three technical papers have been produced dealing with the full range of most relevant political questions about road user charging.

- **PROGRESS** and **CUPID** (start May 2000, end 2004). The objective of **PROGRESS** is to test and evaluate the introduction of integrated urban pricing schemes in a number of European cities. With a total value of over 10 M€ this project has a critical mass, political support and a high profile. The accompanying **CUPID** thematic network will develop and implement a sound pan-European evaluation framework for urban pricing demonstration sites. **CUPID** will also have a role of facilitator for exchanging useful information, organising workshops on key issues and running awareness raising and dissemination activities. The **PROGRESS** demonstrations vary in size and scope:
  - city-wide electronic cordon pricing in Bristol
  - inner-city cordon pricing in Genoa
  - area-wide electronic parking pricing in Rome that will develop into cordon-pricing
  - integrated payment system for road pricing and public transport in Trondheim
  - paper-based or electronic cordon-pricing in Edinburgh
  - distance-based pricing concepts based upon (satellite) vehicle location systems with substantial number of volunteers in Copenhagen and Gothenburg
  - Some modelling work will be done in Helsinki.
- **DESIRE** (Start January 2001, end 2002) will study different designs for inter-urban, distance-based truck charging systems requiring only minor roadside investments. The project will in particular focus on countries that have not yet implemented direct user charging schemes. Non-discrimination, user friendliness and the ability of the systems to reflect marginal costs will be looked at.
- **MC-ICAM** (Start January 2001, end 2003) will develop a phased approach to implementing marginal cost pricing across all modes and both for passenger and freight transport. The project looks both urban and interurban contexts and includes ten detailed case studies to assess the welfare implications of pricing. The project will also assess and develop practices for the use of revenues in relation to marginal cost pricing and carry out in-depth modal level analyses of the current pricing and other regulatory issues, and of the barriers to marginal cost pricing in different modes. One of the results of the project will be a suggestion of the transition path and the necessary or second-best optimal implementation steps in different policy-making contexts.

- **IMPRINT-Europe** (Start January 2001, end 2004) is a thematic network and will bring together researchers, professionals, policy-makers and operators in order to promote the implementation of transport pricing reform based on marginal cost principles. The network encompasses both urban and inter-urban transport and all the main passenger and freight modes. It works in close co-operation with the MC-ICAM and will also liaise with other relevant EU and national projects.

### ***Further directions in pricing research***

The vast programme on transport pricing research in FP4 had an emphasis on the concept and theoretical principles of marginal cost pricing. With the FP5 the emphasis has shifted to practical implementation issues and demonstration projects, including analysis of acceptability and assessment of the distribution of impacts. In the future research on pricing, it will be important to begin to look beyond the current policies and marginal cost pricing in isolation and to assess the role transport pricing has in the overall transport policy development.

**CIVITAS** is a major new demonstration initiative in this direction and combines the strengths of the transport and energy research programmes. The aim of CIVITAS is to assess the impacts, including those on congestion, energy consumption, noise and air pollution, of the introduction of integrated sustainable urban transport policy strategies, supported by innovative measures, technologies and infrastructures.

Research will also be launched in the following fields:

- Assessment of the respective roles of economic instruments, regulation and physical measures in achieving efficiency and equity objectives. (3<sup>rd</sup> call of FP5).
- Development of a framework for linking pricing and taxation of the use of transport infrastructure to necessary investments in the transport system. The research will also assess the prerequisites and modalities for the creation and implementation of national and regional multimodal as well as unimodal transport investment funds. It will develop efficient, fair and acceptable solutions for the use of revenues from integrated pricing strategies in cities, taking account of investment needs in the urban transport system (5<sup>th</sup> call of FP5).
- Development of a framework and analysis of the different roles of decision making governing bodies, cities and regions have in implementing transport policies, including pricing, and consequently in achieving a well functioning and efficient transport system (5<sup>th</sup> call of FP5).

## Efficient pricing in transport – Summary of key messages from research

**Efficient pricing can be implemented.** *The concept of marginal cost pricing can be translated into concrete pricing or taxation measure using existing technology. Simple “second best” approaches, such as cordon tolls and peak/off-peak price differentiation, can often achieve almost as much as the theoretically optimal solutions. Efficient pricing will change the structure of taxes and charges from fixed and blunt measures to more variable ones levied at the point of use. The overall charge levels would not necessarily change.*

**Congestion, accidents and environment can be priced.** *There is enough knowledge on the monetary values of external costs to start with a pricing reform in the transport sector. The remaining gaps are being filled in rapidly by on-going research. In urban areas congestion is becoming the main transport problem and it can represent 90% of all external costs.*

**Efficient pricing will benefit society.** *Efficient pricing is likely to increase prices for car use in congested urban conditions while they could reduce in rural areas. Public transport will become more competitive and need fewer subsidies. As a result of pricing less time is wasted in congestion, there will be fewer accidents and the quality of the environment will improve making the transport system more efficient and society better off.*

**Pricing will make users change their travel patterns and modal choices.** *Pricing measures are effective in changing people’s behaviour and travel patterns. The changes need not be dramatic to have a noticeable effect on the traffic conditions. Car users change timing, route or destination of their trip more readily than mode.*

**Pricing can be made acceptable to policy makers, business and citizens.** *By making pricing part of a package of policy measures, by offering alternatives to car use and by using the revenues in the most profitable way for the local context, be it in transport or in other sectors, efficient pricing can be acceptable to citizens and business. A “clever” marketing strategy and sound consultation process are crucial for the success of the package.*

**Some gaps in knowledge still remain.** *Further research is needed to look into (i) the details of implementation of pricing to ensure level playing field within and across modes including demonstrations, (ii) the links between pricing of external costs and financing of infrastructure investments, (iii) the role of pricing in the broader policy and institutional context. These areas will be covered by the end of the 5<sup>th</sup> Framework Programme, key action 2 on Sustainable Mobility and Intermodality.*