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**Third Annual Thematic
Research Summary –
Pricing, Taxation and Fi-
nancing Tools**

EXTR@Web Project

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Further information on EXTR@Web's editorial team for Thematic Research Summaries can be obtained from Annex III.

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Abbreviations and Acronyms Used

AG	High level Advisory Group (to the EXTR@Web project)
BG	Benchmark Group (associated with the EXTR@Web project)
BOT	Build, Own and Transfer
CEEC	Central and Eastern European Country
CTP	Common Transport Policy
DAREA	Distance-dependent area pricing
DBFO	Design, Build, Finance and Operate
DG TREN	EC Directorate-General for Energy and Transport
EC	European Commission
ERDF	European Regional Development Fund
EFTA	European Free Trade Association (Norway, Iceland, Switzerland, Liechtenstein)
ERA	European Research Area (EU, EFTA and CEECs)
EXTR@Web	Exploitation of Transport Research Results via the Web (DG TREN FP 5 Accompanying Measure project)
EU	European Union
FP 4 (5, etc)	EC Fourth (Fifth, etc) Framework Programme
HGV	Heavy goods vehicle
IRPS	Inter-urban road pricing schemes
NET	Distance-dependent network pricing
PAG	Programme Analysis Group (part of EXTR@Web project)
RTD	Research and Technical Development
TRKC	Transport Research Knowledge Centre; TRKC website at ec.europa.eu/transport/extra

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1. Introduction

This paper provides a structured guide to the results of Research and Technical Development (RTD) projects relating to **Pricing, Taxation and Financing Tools**, carried out in transport research programmes throughout the European Research Area (ERA).

It is one of a series of 28 papers. Two further from an original set of 30 transport themes – i.e. Long-distance Transport and Financing Tools – have been discontinued as separate reports, though all related projects will eventually be covered elsewhere in Thematic Research Summaries.

	Paper no.	Transport theme
Dimension 1	1.1	Passenger Transport
	1.2	Freight Transport
	1.3	Urban Transport
	1.4	Rural Transport
	1.5	Regional Transport
	1.6	EU Accession Issues
Dimension 2	2.1	Air Transport
	2.2	Rail Transport
	2.3	Road Transport
	2.4	Waterborne Transport
	2.5	Other Modes
	2.6	Intermodal Transport
Dimension 3	3.1	Economic Aspects
	3.2	Efficiency
	3.3	Equity and Accessibility
	3.4	Environmental Aspects
	3.5	User Aspects (incl. ergonomics, quality, choice and rights)
	3.6	Safety and Security
Dimension 4	4.1	Decision-support Tools
	4.2	Information and Awareness
	4.3	Infrastructure Provision (incl. TENs)
	4.4	Integration
	4.5	Intelligent Transport Systems
	4.6	Regulation / Deregulation
	4.7	Land Use Planning
	4.8	Transport Management
	4.9	Pricing, Taxation and Financing Tools
	4.10	Vehicle Technology

Of the more than 5600 projects from research programmes the Transport Research Knowledge Centre (TRKC) ultimately has considered, a total of **149** projects deal partly or fully with the issues of **Pricing, Taxation and Financing Tools**.

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1.1 How to use this paper

It is recommended that you use this paper to locate RTD (Research and Technical Development) results on sub-themes where you have a particular interest, rather than reading the paper from start to finish:

- Start in Section 2 to get an overview of the scope of the particular theme.
- Read Section 4 that summarises the findings for each sub-theme of interest to you.
- Consult Annex I to identify the individual projects, be they of European or national origin, relating to a particular sub-theme.
- If this is the first time you have used one of the series of thematic research summaries, it is strongly recommended that you read Annex II. This explains the background and purpose of the EXTR@Web project, and the basis upon which information in this document was selected and analysed.

The other sections of this paper can help you to gain an overall picture of the **Pricing, Taxation and Financing Tools** theme, associated policy issues and the background of project EXTR@Web.

The analysis in this paper is the responsibility of the EXTR@Web project team, and does not represent the official viewpoint of the European Commission.

1.2 The link to the Transport Research Knowledge Centre website

Further details on individual projects can be obtained from the Transport Research Knowledge Centre (TRKC) website at: ec.europa.eu/transport/extra

The TRKC website includes summaries and full final reports of individual projects, as well as a variety of analyses, and publications prepared by the EXTR@Web project.

How to best use the online resource:

- The 'Projects & Analysis' section allows the user to specify a project-wide search on 'Publication date', 'Origin', 'Document type', 'Mode', 'Sector', 'Geographic area', 'Policy objective' and 'Tool', or any combination of these criteria.
- This may be complemented, or superseded, by the flexible 'Free text search'.
- On the query result screen, free text search criteria may be refined, as appropriate. Further tick boxes here allow limiting query results according to 'Project status' (five levels).
- Query results are presented in a table, which allows for sorting by column (click on relevant column header for alphanumerical sorting).
- Project-specific summaries may include links to project websites, or provide contact details for the project, where available.

It should be noted that the online Transport Research Knowledge Centre will be updated frequently, though dependent on input from project co-ordinators.

Other parts of the TRKC website cover transport research at Programme level, and expand on transport related issues, e.g. in the 'Links', 'Events', 'Glossary' and 'FAQs' sections.

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2. Scope of theme

2.1 Definition of theme

Pricing is a central tool for resource allocation in the view of economists but a more general definition of it refers to measures of making up the price for certain commodities and services.

Pricing and Financing are closely linked, as pricing represents one of the most important methods of raising capital for the financing of works, acquisition of equipment/rolling stock, etc. In the context of transport pricing has another equally important role, since it can be a key mechanism for influencing the demand for travel for each mode of transport, in order to achieve transport policy goals, such as economic efficiency and environmental sustainability.

Taxation is a system or regulation of imposing tax on the consumers for the consumption/purchase of certain commodities and services. Taxes are, with rare exceptions, either related to the right of access or to the use of the infrastructure, and are a simple and practical instrument for raising state revenues.

In the context of transport, pricing and taxation could act as management measures to regulate the transport market although their main purposes of their introduction (from the state) are slightly different. The two different objectives (public revenues and transport management) are often confused by the public and politicians and as such the implementation of transport pricing measures usually faces stiff opposition.

The projects on pricing and taxation cover a spectrum of inter-related objectives. These objectives are to:

- Show that pricing at marginal social cost helps to internalise the external costs of transport and secure more efficient use of the transport network;
- develop a better and more detailed understanding of transport costs on which to base transport prices;
- identify barriers for the implementation and public acceptance of pricing and taxation instruments;
- evaluate the existing pricing and taxation instruments in Member States; and
- evaluate the effects of new charging principles, pricing schemes and tolls on modal split, traffic volumes and trip patterns.

Financing Tools involve options to bridge the gap between the financial profitability of transport projects and their socio-economic viability by facilitating and promoting ways to finance the operation of transport projects. In addition, financing tools are the instruments that provide the needed capital upfront for the construction or renewal of infrastructure.

Financing tools are funding mechanisms that can be divided into two major categories:

- Cash management tools; and
- credit enhancement and/or investment tools.

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Specific examples of approaches addressing issues about financing tools for transport projects are the following:

- Assessment of positive and negative impacts resulting from new financing principles;
- financing schemes for transport systems operations;
- socio-economic financial and risk analysis framework;
- provision of capital for investment; and
- financing to cover construction/renewal costs.

A global concept of financial function should be adopted beyond the notion of the “treasury” and capable of using all the state-of-the-art instruments of financial engineering. This means creating suitable organisational structures with the capacity to manage new approaches in financing, which have not traditionally been part of the apparatus of capability required of an administrative body.

The key to developing a successful transport project is to identify the project goals and find the necessary funds to achieve them. For example, the financing tools for the development and the implementation of improvements to a transport system can be private investment, public investment at local, regional or national level, EU framework programmes or structural funds.

2.2 Topics included in theme

Major topics to categorise aspects of **Pricing** and **Taxation** include the following:

- Marginal social cost pricing (refers to the so-called “user pays” principle);
- infrastructure and operating costs;
- external costs;
- urban transport pricing (demonstration and evaluation of the effectiveness and acceptance of integrated urban transport pricing schemes to achieve transport goals and raise revenue);
- interurban road pricing schemes (assessment of distance based inter-urban road pricing in Europe, focusing on heavy vehicles and considering future extensions towards other type of vehicles);
- devising rail infrastructure charges;
- implementing a coherent multi-modal pricing strategy;
- user acceptance (related to pricing schemes and taxation levels); and
- taxation of services, fuel.

Major topics to categorise aspects of **Financing Tools** are:

- Transport modes (road, rail, air, short sea shipping and inland waterway);
- transport Infrastructure (investment needs, planning, construction, maintenance for all transport modes including stations, terminals, depots, etc.);
- financing schemes (involvement of the private sector in financing and operating transport infrastructure projects);
- freight transport operations (for all transport modes); and
- passenger transport operations (including public transport).

The above can be studied in terms of planning, management and operation for each mode.

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The above summary of topics describes the principal breakdown of technical, organisational and managerial aspects that come under the theme, whereas Chapter 4 of this document reflects sub-themes according to priorities in transport research policy.

2.3 Significance of theme

Transport pricing has been an actively debated topic in the European Union for a number of years. This debate has been stimulated both by the European Commission itself (notably through the publication of the Green Paper on Fair and Efficient Pricing and the White Paper on Fair Charging for Infrastructure Use) and by a multitude of national policy initiatives.

The tolling of specific inter-urban highways or of major bridges/tunnels has been extensively applied in a number of EU countries for many years. In contrast, urban road pricing has had a long history of academic discussion and study, however it has had much less practical application to date. Major applications include a sophisticated urban road pricing scheme in Singapore, cordon pricing schemes in Trondheim and Bergen and more recently, since 2003, the central area scheme in London. In 2001 and 2004 Switzerland and Austria began charging trucks, followed by Germany in 2005.

The London scheme is an example closely watched in other parts of the world. Roadside cameras record the number plate of every vehicle within the “congestion charge” (CC) zone during the charging period (0700-1830, M-F) with exemptions (buses, taxis, motorcycles) and discounts (90% for CC zone residents, 100% for blue badge holders). One year after the introduction, congestion has reduced by up to one-third, in terms of time the drivers spend stationary or moving slowly in queues, traffic entering the zone by 18% and traffic circulating within the zone by 15%, all values which are towards the top end of the range of predictions. There is no evidence of systematic increases in traffic outside the charging zone. The increase in bus patronage in the morning peak has been higher than expected (38% against 20%) [12].

The scheme in Switzerland (distance-based heavy vehicle fees, LSVA) charges all roads while only motorways in Germany. The Swiss system is reported to have achieved success in reducing truck traffic across Switzerland. Moreover, transport companies now try much harder to ensure that their trucks do not cross the Alps empty. The German system is seen as a platform for additional services such as fleet management, traffic alerts and navigation. This complexity resulted in delays in implementation. A study in the UK looked at the potential benefits of a comprehensive congestion charging scheme for roads in England. The congestion charges would be determined based on the costs that road users impose on each other and their surrounding environment (i.e. marginal social cost pricing). The charging scheme examined would be fiscally neutral with reduction in motoring taxes alongside the introduction of charges on roads where and when congestion occurs.

The theoretical aspects of different pricing principles and the economic effects of specific pricing measures have been examined extensively in the scientific and technical literature. However, most debates revolve around the issue of the public and (linked to this) political acceptability of pricing measures. Indeed concerns regarding acceptability are now constituted the most significant single barrier to implementation, especially in the road

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transport sector where recent studies suggest that pricing measures are rejected by the majority of car drivers.

The pricing principle makes transport users to face all the incremental costs of using the transport system – operating, maintenance and renewal, safety and environmental costs.

The underlying message of the Commission's infrastructure charging policy is that transport taxes and charges, in every mode of transport, should be varied to reflect the cost of different pollution levels, travelling times, level of service quality and damage (wear and tear) costs as well as infrastructure costs in order to achieve the "polluter pays" principle and provide clear fiscal incentives to reduce congestion and pollution, re-balance the modal split and decouple transport growth from economic growth. Getting transport operators to pay for the use of the infrastructure is necessary and fair, because it secures the best possible use of the transport network.

Often transport projects are large and complex, requiring the state or state agencies to commit funds for several years before a project even begins. To help ease this burden on the state (and indirectly to taxpayers), many new techniques exist for financing projects.

The major financing tools are DBFO (Design, Build, Finance and Operate) and BOT (Build, Own and Transfer) that are used for many infrastructure projects in Europe today, securing:

- The Optimum risk allocation among the involved sectors according to each sectors ability and/or experience to control the risk, in order to secure the achievement of the project objectives and the gain of potential benefit to be gained either in terms of profit or policy fulfilment;
- market based financial instruments use i.e. stocks, bonds etc., for project funding, which will help to build the confidence of the private partner in the project; and
- transport systems operations dealing with project implementation accomplishment on time.

The past decade has seen a new global economic trend emerge, which emphasises privatisation, economic deregulation and reducing governments' role in virtually all sectors of the economy. Supporting new mechanisms which enable direct private sector investment in infrastructure projects is part of this trend, currently being promoted by the European Commission as a strategy for increasing efficiency, reducing the drain on state revenue and enhancing private sector development.

EC finance is deliberately targeted to meet the financial demands of projects through the different stages of their development. Different EC instruments were therefore specifically created in the form of grants, equity or guarantees to finance projects through the conceptual and development phases whereas other instruments such as EIB loans are available to finance the construction and operation phases.

The transport sector is unique in that it usually involves closer, and more politically sensitive contact with the consumers of the project's services than would be the case for most other infrastructure sectors. The success of a transport project can be largely dependent upon the accuracy of traffic flow forecasts and the competitiveness of the project's pricing regime (i.e., tolls, fares, etc), which affects its' transport operations. There are also financial subsidies (and even rescue packages) for existing transport operations that affects the transport services. It must be noted that the financing tools use is related also with transport pricing issues as mentioned before in project regime.

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3. Policy context

3.1 Pricing and taxation

The contributions of the Commission to the debate on infrastructure charging included the Green Paper “Towards Fair and Efficient Pricing in Transport” [1], the White Paper “Fair Payment for Infrastructure Use: a Phased Approach to a Common Transport Infrastructure Charging Framework in the EU” [3], and the series of reports of the High Level Group produced in 1998 and 1999.

The Green Paper and the White Paper had underlined:

- The need for harmonisation of charges in the transport sector across member States to consolidate the common market;
- the opportunity to radically change the structure of charges to internalise the social and environmental costs of transport (accidents, noise and vibration, air, water and soil pollution, and congestion) which are often not considered in the decisions relating to the choice of the transport mode and in the strategies for infrastructure provision;
- the opportunity to base the “user pays” principle on the marginal social costs, thus implying higher costs for the user that produces additional costs for the excessive use of the resources;
- the need for harmonisation of the cost calculations of each mode of transport, in order to determine charges dependent on the total costs implied by the modal choice; and
- the need for providing the governments with transport policy instruments based on the costs of the infrastructures in order to encourage the use of modes with less environmental impact and to make new infrastructure investments feasible.

The High Level Group established by the Commission to further investigate the feasibility and applicability of charges based on external costs:

- Set the general criteria on which the transport infrastructure charging policies need to be based in the Community;
- identified the elements that form the total costs of transport, with specific regard to the external components of the costs;
- addressed the methodological issues in the estimation of the costs; and
- provided a set of operational measures able to internalise costs.

Among the proposals of the High Level Group are:

- Different levels of taxes for different types of fuels (leaded, unleaded, diesel, LPG, hydrogen, kerosene) to encourage the use of cleaner engines and fuels and reward with lower charging rates those who use them;
- varying rail access, air traffic service charges, airport landing, and vehicle toll charges according to the time of travel to provide an incentive to travel outside peak hours and thus contribute to congestion (making it happen not only for the individuals travelling on trains and planes, but also for the trains, planes and cars that do the travelling);
- varying charges according to vehicle/plane/ship size, weight or other appropriate dimension to provide the incentive to use less damaging transport (e.g. lighter or better configured vehicles);
- varying accident insurance premiums to reflect different risk categories to signal where the different costs lie and more fairly allocate the costs between users; and

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- using further differentiated road tolls, extended where appropriate to other parts of the road network, and the development of distance-related charges for heavy good vehicles to succeed fixed-period user charges.

Current practice is not fully consistent with the principles set in the Green and White papers on infrastructure charging and instead seems to support pricing for commercial operations and total cost recovery rather than marginal cost pricing. Commentators have underlined that some parts of the transport sector (e.g. airports and seaports) emphasise total cost recovery rather than marginal cost pricing, probably because the issue of preventing the use of state aids to give unfair competitive advantage has long been a major issue there. In the local public transport sector fares are commonly not based on marginal cost pricing principles but on a combination of political factors, including revenue needs and vote gaining.

The 2001 Directive (2001/14) on rail infrastructure charging has required marginal social costs to be used as the basis of charging, whilst permitting supplementary charges where necessary for cost-recovery purposes.

In the road sector the White Paper “European Transport Policy for 2010: Time to Decide” [5] had suggested the reform of the Directive 1999/62 (the Eurovignette” Directive) on the charging of heavy goods vehicles for the use of certain infrastructures. The subsequent proposal of the Commission for a new Directive amending the Eurovignette Directive [8] aimed to change the framework for tolls and vignettes for goods vehicles over 3.5 tonnes with the introduction of a higher differentiation including: distance travelled, accident and environmental costs, congestion levels by time period, local population density, vehicle emission classes. In addition, the proposal provided the methodologies for the calculation of the different toll components and allowed the Member States to apply mark-ups to tolls in particularly sensitive areas to cross-finance the investments costs of other transport infrastructures – railways - of a high European interest in the same corridor or area.

After these developments, in February 2006 the EU has finalised the approval of a new Directive on road infrastructure charging. The text amends the 1999 “Eurovignette” Directive. The scope of the new road charging Directive is broader. It lays down rules for tolls or user charges on the trans-European network, whereas the previous Directive limited tolls and charges to motorways. It allows Member States to levy tolls and user charges on all other roads as well. The Directive applies to vehicles over 3.5 tonnes, rather than only to vehicles over 12 tonnes as in the past.

The new Directive represents the first step towards taking account of external costs: it will allow a greater variation in tolls to reflect congestion, and toll variations to reflect the pollution caused by vehicles will be mandatory from 2010. It also makes provision for Member States to be able to increase tolls with a “mark-up” on roads in particularly sensitive mountainous regions. The income from these mark-ups must be used to fund alternative transport infrastructure.

The new Directive also establishes the principles for calculating tolls and limits frequent user discounts, to ensure that they are fair, proportionate, transparent and non-discriminatory. These improvements will reduce obstacles to the free movement of goods and guarantee fair competition between road haulage operators.

In the White Paper, charging for infrastructure was recognised as one instrument, together with fuel tax, for integrating infrastructure costs and external costs, and thus replacing existing transport system taxes. The White Paper stressed that while transport may be too

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heavily taxed it is above all badly and unequally taxed. As users are all treated alike, irrespective of the infrastructure damage, bottlenecks and pollution they cause, there are considerable distortions of competition both between transport operators and between modes of transport. By contrast, infrastructure charging is a particularly effective means of managing congestion and reducing other environmental impacts, and fuel tax lends itself well to controlling carbon dioxide emissions.

The Mid Term Review of the 2001 White Paper [9] underlines the need for a process of reflection on smart forms of charging for all modes: road, rail, air, waterborne and urban transport. The focus is on how smart forms of charging can help to optimise transport patterns and thus create win-win situations for infrastructure owners, users and the wider society. It is also said that smart charging should ensure fair and non-discriminatory prices for users, revenue for future infrastructure investment, ways to fight congestion, discounts to reward environmentally more efficient vehicles and driving.

In the air sector, following the Communication on taxation of aircraft fuel in 2000 [4], the White Paper had suggested to re-consider the tax exemption for kerosene on intra-Community flights as this exemption provides no incentive for airlines to use the most efficient aircraft and also creates situations where the competition between air transport and other modes is unfair. As a follow up the Directive 2003/96 on taxation of energy sources has introduced provisions which allow Member States to tax aviation fuel for domestic flights, and, by means of bilateral agreements, fuel used for intra-Community flights.

In the road sector, the White Paper had stressed the need for a harmonised taxation of fuel used for commercial purposes. In order to reduce distortion of competition and encourage diversion of road traffic towards more sustainable modes, the Commission has subsequently proposed [7] to amend Directives 92/81 and 92/82 which had imposed less taxation on diesel for reasons of economic needs of road hauliers.

Also, the White Paper had underlined support for use of alternative fuels. As a follow-up, fiscal promotion of bio-fuels has been included in a proposed Directive [6]. This has been incorporated mainly within Article 16 of Directive 2003/96 on taxation of energy sources which provides Member States with the option of applying a reduced rate of excise duty to pure or blended bio-fuels, when used as motor fuels.

Aside from fuel taxes, two problems which need consideration mentioned in the White Paper are:

- The different VAT arrangements for air, rail and coach travel, as far as they cause unfair competition between modes and risk of upsetting the proper functioning of the internal market; and
- the determination of the place where transport service provision is to be taxed.

To ensure European industry competitiveness and promote the re-flagging of as many ships as possible to Community registers the White Paper had underlined the support for the tonnage-based taxation system, which since then has been adopted in an increasing number of Member States.

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3.2 Financing

The Trans- European Networks for Transport (TEN-T) are a key element in the process of further economic integration and promotion of free traffic of goods, persons, services and capital as well as economic growth via the social cohesion in the single European market. The programme for the development of the TEN-T will require large investments and is certainly one of the most ambitious infrastructure initiatives since the foundation of the European Community.

One of the most promising financing tools to minimise public costs of the TEN-T is private financing, as recognised amongst others by the High Level Group of Public Private Partnership Financing of TEN-T [2]. According to ECMT [10] the financing schemes will supply the tools and methods of "...sharing the risks and responsibilities". The European Commission's 2001 White Paper [5] states that the public fund must be more selective and focus on the major transport projects necessary for territorial cohesion of the European Union. The major funding tools for the implementation of CTP (Common Transport Policy) are ERDF and related Structural Funds.

Financing in Public-Private Partnerships (PPPs) is often a mix of financing from public and private sources. The financing instruments are given to increase financial viability of a project. Also EU policy subsidised certain transport services using relevant financing tools for operations, and not just infrastructure projects – and covers local public transport, railways; airlines, and ferries to islands. The financing tools are also used in local, regional and national level, using EU funds (Community Support Framework, Cohesion Fund), adopting the financing instruments stated above.

According to the 2001 Transport Policy White Paper, a large number of political measures and instruments such as financial tools will be needed to launch the process which, over the next 30 years, will lead to the kind of a sustainable transport system set out in the White Paper. These include the adequate funding of transport infrastructure needed to eliminate bottlenecks. The Mid Term Review of the 2001 White Paper [9] has underlined that user charges should contribute more to the financing of the most commercially viable parts of the transport networks. Also it is stated that public-private partnerships should be used more as they can accelerate the implementation of projects, increase value for money and ease pressure on public finances.

It must be noted that the key problem relating to transport infrastructure and operations investment is limited public funding. In order to address this problem, the EC supports cross-funding whereby the revenue from infrastructure charging can be used to finance missing links in the corridor concerned, even for another mode of transport. This implies modifying Directive 99/62 to allow road tolls to cover costs other than those directly relating to the tolled infrastructure. This principle has been endorsed in the new Directive on road infrastructure charging. In addition, the Commission supports introducing greater flexibility into public contracts and the clarification of concession rules, in order to reassure private investors. It also wishes to encourage the creation of single bodies (such as European Economic Interest Groups – EEIGs) responsible for obtaining and utilising funding.

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4. Synthesis of findings from completed projects

Research projects contributing to the theme of **Pricing, Taxation and Financing Tools** can be broken down to the following sub-themes:

- Real transport costs – internal and external;
- fair and efficient pricing;
- urban and road pricing;
- economic instruments;
- use of revenues from pricing; and
- forms of transport systems funding.

You may wish to further consult the following Thematic Research Summaries that present research findings which are complementary to those covered in this paper:

- D2.E-1.1 Passenger transport;
- D2.E-1.2 Freight transport;
- D2.E-1.3 Urban transport;
- D2.E-3.1 Economic aspects;
- D2.E-4.3 Infrastructure Provision; and
- D2.E-4.5 Intelligent Transport Systems.

Results from the following **16** projects have been included in this Thematic Research Summary:

Research sub-theme	Contributing projects
Real transport costs – internal and external	RECORDIT; UNITE
Fair and efficient pricing	IMPRINT-EUROPE; MC-ICAM; UNITE; Fair and efficient pricing; Multi-modal freight model for distance-based HGV charging
Urban and road pricing	CUPID; DESIRE; PROGRESS; TELEPAY; Monitoring effects of road user charging in Durham
Economic instruments	RECORDIT; Evaluation of short-term raises in gasoline prices; Taxation of cars with a bonus-malus system
Use of revenues from pricing	CUPID; MC-ICAM
Forms of transport systems funding	Alternative urban transport funding; Cost-benefit analysis of alternative public transport funding in four Norwegian cities; Funding tomorrow's transport systems; New models for funding of transport infrastructure services

Detailed findings and policy implications for individual projects can be found in Annex I. Please refer to acronyms and project titles, respectively, listed above.

4.1 Real transport costs – internal and external

4.1.1 Research objectives

This sub-theme includes analysis of:

- Internal costs which stem from the provision (construction and maintenance) and use of transport infrastructure; and
- external costs which stem from side effects of transportation such as congestion, accidents, emissions and pollution, noise and aesthetic factors which all negatively affect people and/or future generations.

Research objectives include:

- the development of pilot transport accounts for all modes, for the EU15 and additional countries,
- the provision of a comprehensive set of marginal cost estimates relevant to transport contexts around Europe,
- investigation of current internal and external costs of intermodal transport.

4.1.2 Main findings

Pilot accounts have been provided for all transport modes in EU15 countries plus Switzerland, Estonia and Hungary. Results from accounts show that for road total revenues cover total infrastructure costs in all but one country. In more than half of the countries considered the total revenues exceed the total costs of infrastructure, accidents and the costs of air pollution, global warming and noise. Conversely, for rail the percentage of system costs covered by revenues are in the best case 63%.

From a pricing policy viewpoint it is the use of case study and accounts data together which is likely to be the most practical means of generating useful marginal cost estimates.

Research on marginal costs has produced estimates based on case studies. This has included infrastructure and operating costs, congestion costs, accident cost and environmental costs for the different modes. Scarcity costs linked to path or slot occupied in capacity constrained networks remains an issue to be further understood.

Research into costs of intermodal transport could develop a decision support tool able to provide interested parties with estimate of costs for door-to-door movements on a selection of European corridors.

4.2 Fair and efficient pricing

4.2.1 Research objectives

Fair pricing takes account of the full social costs and benefits of transport. It is analysed in this area, as an attempt to secure the best possible use of the network, reflect the level of service quality, internalise the external costs of transport and encourage the use of non-motorised transport by changing the relative prices of the different modes.

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Research objectives include to:

- Produce reports summarising research and putting forward recommendations on how to implement the required pricing reforms;
- examine optimal implementation (or transition) paths from a situation with low pricing of transport to a situation with socially optimal pricing, in which users bear the full marginal social cost of their activities; and
- investigate how transport infrastructure pricing policy could be improved in Switzerland mainly with a view to road and rail transport.

4.2.2 Main findings

Research into pricing reform has shown that disagreements and uncertainties still exist which prevent from having charges estimated in the various countries according to a common basis: a suggested way forward is to seek consensus on a lower limit of costs.

Areas needing further research identified by the project include processes and institutions (who should set or regulate prices and re-allocate revenues?), and ways of translating research results into action.

In Newly Associated States pricing is seen very much as a way of financing investment both because financing problems are more acute and congestion is not nearly so much of a problem.

Discussion on the current EU policy developments has shown disappointment for the seeming abandonment of the proposed framework directive and common methodology paper for all modes. Priorities for action have been identified, among the others, in reforms for congested urban areas, trans-European road and rail corridors and aviation.

Research on the impacts of different pricing rules has shown that crude use of accounts information to ensure full cost recovery should be avoided as it may easily lead to worse outcomes in terms of congestion and environment than current situation. When budget constraints are binding they should allow for cross-subsidisation between modes in order to do least damage to economic efficiency.

The biggest response to pricing reform tends to involve re-organisation of travel whilst continuing to use the same mode. Distributional impacts are highly affected by the use of revenues. Broader economic impacts remain uncertain, some evidence suggesting they might be negative but small.

Insights have been provided on how the implementation of the pricing reform should progress taking into account the existing barriers and attendant constraints. Case studies which used mathematical modelling concluded that it is beneficial from the welfare viewpoint is to start with simple pricing measures with limited scope, relatively low charges and minimal differentiation if these are the only feasible. In road transport such simple schemes can be cordon tolls and distance-based charges for HGV. It is possible to move to more comprehensive and differentiated schemes in the longer term as confidence and acceptability builds up.

Research into pricing reform in Switzerland proposed the introduction of a tax based on distance travelled similar to the one used for HGV (heavy goods vehicles). In return the fuel tax could be restructured as a CO₂ tax and reduced. Research in UK has developed a more advanced version of a multi-modal freight model for average to long-distance shipments. The model has the capability to assess road charging policies for freight vehicles.

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4.3 Urban and road pricing

4.3.1 Research objectives

Road pricing has a well-established history in the field of transport economics and has been developed and refined in various ways over the last 150 years. Definitions vary though. Among traffic engineers and transport planners, road pricing refers to the imposition of direct charges on road use, with a variety of objectives in mind.

This is in contrast to economists, where the term road pricing is usually taken more specifically to mean setting of price equal to the social marginal cost of a trip (covering mainly congestion costs). But a most widely known definition is charging drivers for using roads, usually in urban areas, and principally to reduce congestion and enhance environment.

Depending on the objective behind the scheme the following forms exist:

- An extended taxation arrangement;
- a general road-pricing scheme for the complete road network;
- direct charging when crossing a specified point, i.e. tolls;
- urban road pricing with the forms of a) congestion pricing, b) area licensing and c) cordon pricing; and
- vignettes scheme.

Research objectives in this area include:

- Development and demonstration of integrated urban transport pricing schemes, based on the concept of marginal-cost pricing, in real urban situations, and development and assessment of the political, economic and social framework required for the implementation of urban transport pricing,
- to provide a set of best designs for future IRPS (inter-urban road pricing schemes) for heavy vehicles, considering the possible future extension to individual mobility;
- actual implementation under real traffic conditions of an interoperable electronic toll system in several European countries; and
- to establish the technical, legal and commercial feasibility of a purchase and payment system for virtual 'e-tickets' through mobile phones, using SMS, WAP and short range communication technologies.

4.3.2 Main findings

Research on implementation of urban road pricing has investigated case studies presenting different stage of development (from proposal and modelling study only to full-scale implementation). Evidence has been provided covering the areas of legal, organisational and financing issues, consultation, marketing and press coverage, charging technologies, and impacts of the scheme.

The pricing schemes showed overall benefits in terms of congestion reduction and environmental impacts while maintaining acceptable boundary congestion levels as a side-effect. Maximum benefits are achieved if pricing is combined with complementary measures. Acceptability is a main concern, although opposition seems to reduce after implementation. Success factors of urban road charging schemes include proper communication, transparency and accountability in the allocation of revenues, hypothecation of revenues within the transport sector, a strong scheme promoter.

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Research in UK provided an assessment of the traffic impacts for the road charging scheme introduced in 2002 in Durham. The authority deems the set objectives have been achieved. Decreases in vehicular activity have led to reductions in vehicle emissions, noise and visual intrusion enhancing the World Heritage Site and monument area. Environmental improvement has encouraged an increase in pedestrian activity. Public perception of the scheme has improved significantly following its introduction.

Research into inter-urban road pricing schemes (IRPS) has focused on two distance-dependent schemes: DAREA (“Distance-dependent area pricing” is based on the amount of kilometres driven within a certain perimeter) and NET (“Distance-dependent network pricing” is based on the kilometres driven on a net of interrelated motorways of the same hierarchy-level).

The introduction of road tolls should be expected to have as effect the choice of alternative road corridors as well as better logistic organisation. Some reduction of trade and slow-down of economic growth should be expected due to the higher transport costs; in the longer term if revenues are used to reduce indirect taxes a positive welfare effect should be expected. To avoid as a consequence of a NET scheme the traffic detour to secondary roads, with attendant externalities, a mixed NET/DAREA scheme might be considered a good solution although this might raise problems of acceptability. The Directive 99/62 might be revised. The setting of regulatory charges on the secondary network should be allowed where HGV (heavy goods vehicles) traffic causes considerable externalities.

The technical and commercial feasibility of using portable phones for the payment of transport services has been assessed. Research could demonstrate different approaches based on GSM in various test sites. In particular contractual issues have been investigated. Research concluded suggesting the necessary steps for the development of a European concept based on such technology.

4.4 Economic instruments

4.4.1 Research objectives

Economic instruments are implemented as part of a nation wider transport strategy. The most important examples of such national economic measures, which analysed in this area include:

- Vehicle taxation which can take the form of a sales tax or an annual vehicle circulation tax; and
- fuel taxation which is the most common form of user charges in road transport and offers a reliable way of charging the users of transport infrastructure relative to their individual use.

Also, environment-related taxes are relevant. These are defined as any compulsory payment to general government levied on tax-bases deemed to be of particular environmental relevance.

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Research objectives for this sub-theme include to:

- Improve the competitiveness of intermodal freight transport in Europe through the reduction of cost and price barriers;
- develop a framework for defining combinations of economic instruments, regulatory and physical measures;
- investigate the impacts of a bonus-malus system for cars in terms of CO₂ emission reductions as well as feasible implementation options; and
- assess the short-term impacts of fuel price increases on fuel sales and car purchase decisions.

4.4.2 Main findings

Research into costs of intermodal transport provided an assessment of the reform of the taxation system in the European countries which would enable an increase of the competitive position of intermodal transport compared with road transport.

According to research into taxation of cars with a bonus-malus system in Switzerland the impacts in terms of CO₂ emission reduction might be significant. Extensive secondary effects should be expected ranging from a more energy-saving behaviour (ecodrive) to greater utilisation of public transport, avoidance of un-necessary journeys and greater use of renewable sources of energy. Uncertainties include among the others the response of dealers. The administrative issues to consider include creation of the necessary legal basis, data collection, setting target values.

Research into evaluation of short-term raises in gasoline prices in Switzerland estimated elasticity between -0.3 and -0.4 of fuel sales with fuel price that is if price rises by 10% fuel sales decrease by 3-4%. The traffic volumes develop similarly as the fuel sales. Lower impacts on traffic volumes are observed on highways compared to other roads. Leisure traffic is more price-sensitive as weekend traffic volumes show greater change than in weekdays. A survey among car sellers showed no effect on car sales from fuel price rise.

4.5 Use of revenues from pricing

4.5.1 Research objectives

Pricing and financing are closely linked as pricing represents one of the most important sources of financing transport system. User contributions such as road user charging (i.e. road tolls), parking charges, vehicle licensing, fuel taxes and public transport fares are analysed. This sub-theme covers also cross-funding, the type of funding between modes of transport and between user groups which refers to using a surplus created in one place to cover losses created in another place.

Research objectives include the investigation of the attributes of effectiveness, efficiency, equity and acceptability of the use of revenues from pricing schemes.

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4.5.2 Main findings

Research on the implementation of a pricing reform could conclude that the best use of revenues from road user charging schemes from the welfare perspective would be to reduce other distorting taxes, such as taxes on labour. However, the problem is that these tax reductions would be widely spread and would not be perceived as a benefit of the pricing reform. It may necessary, in the beginning at least, to accept a less than optimal use of revenues in order to provide clear benefits to the losers of the scheme and to buy off their opposition.

4.6 Forms of transport systems funding

4.6.1 Research objectives

This area deals with the different ways to fund transport infrastructures and services.

The area of private investment refers to different kinds of arrangements that aim at organising the building, renovation, financing and management of the infrastructure between the private and the public sector. The most radical extreme of private finance is privatisation but in transport infrastructure different kinds of public-private partnerships are more common than privatisation.

There are three types of PPP that are common to many infrastructure projects:

- Concession type PPPs (private sector takes on 100% of the investment);
- joint venture type PPPs (the investment participation by the private sector is thus lower than 100%); and
- hybrid form of PPPs (in this type of PPPs the project is split in several project components).

Other available financial types to raise cash to finance investments are:

- Debt finance;
- equity finance; and
- other types, i.e. bonds and grants.

The area covers also value capture, a type of funding where costs are paid in a fair way i.e. by beneficiaries of the system. Value capture refers to situation in which some other party than the actual user of the transport service receives benefits from the implementation of the transport investment.

Research objectives in this area include the investigation of the institutional and financial reforms on funding transport systems, including road infrastructures and public transport.

4.6.2 Main findings

Research on funding tomorrow's transport systems in Switzerland has proposed an overall reform with the following pillars. The national motorways are managed by firms, who get a concession for 10 to 15 years, and are funded by user fees; a national motorway fund is

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created with the aim of covering deficits with surplus firms. Simplified co-operation between the federation and the canton in the field of road construction allow the cantons retain the right to levy a vehicle tax and so to decide on the level of road construction. Federal transfers and subsidies are based on the revenue of the respective transport firms and cantons are free to use grants either for covering deficits or for new investment into public transport infrastructure. Special transport bodies in the urban agglomerations are created with the task of coordinating and funding public and private transport. The existing fund for public transport infrastructure is converted into an investment fund used not to grant subsidies but loans in the construction period.

Examination of the development of future funding mechanisms of transport infrastructure services in Finland led to the proposal to convert the current regime based on fiscal taxes into one centred around charges for use. It was underlined that the reform should be neutral in terms of the burden placed upon the transport service user.

Research in Norway dealt with the problem of searching funding mechanisms for public transport companies in cities. The question is that of finding incentives which reconcile the commercial objectives of the operators with the socio-economic objectives of the authorities. It was suggested that output based funding can produce significant economic benefits and increase ridership. Research also looked into the impacts of the introduction of road charging on the level of subsidies to public transport.

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5. References

- [1] CEC(1995) Towards Fair and Efficient Pricing in Transport. Policy Options for Internalising the External Costs of Transport in the European Union. Green Paper. COM(95)691, Brussels.
- [2] CEC(1997) 'Report of the High Level Group on Public-Private Partnership financing of trans-European Transport Network Projects'. May 1997
- [3] CEC(1998) Fair Payment for Infrastructure Use: a Phased Approach to a Common Transport Infrastructure Charging Framework in the EU. White Paper. COM(98)466, Brussels.
- [4] CEC(2000) Taxation of aircraft fuel. COM(2000)110, Brussels.
- [5] CEC(2001a) European Transport Policy for 2010: Time to Decide, White Paper. COM(2001)370, Brussels.
- [6] CEC(2001b) Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of biofuels in transport. Proposal for a Council Directive amending Directive 92/81/EEC with regard to the possibility of applying a reduced rate of excise duty on certain mineral oils containing biofuels and on biofuels. COM(2001)547, Brussels.
- [7] CEC(2002) Proposal for a Council Directive amending Directive 92/81/EEC and Directive 92/82/EEC to introduce special tax arrangements for diesel fuel used for commercial purposes and to align the excise duties on petrol and diesel fuel. COM(2002)410, Brussels.
- [8] CEC(2003) Proposal for a Directive of the European Parliament and of the Council amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures. COM(2003)448, Brussels.
- [9] CEC(2006) 'Keep Europe moving – Sustainable mobility for our continent. Mid-term review of the European Commission's 2001 Transport White Paper.'; COM(2006)314, Brussels
- [10] ECMT(1999) 'Public-Private Partnerships in the Transport Sector'.
- [11] EXTR@Web project: 'Transport Research Knowledge Centre (TRKC) website' (ec.europa.eu/transport/extra), 2004-2006, Brussels
- [12] Mayor of London and Transport for London (2004) Central London Congestion Charging: Impacts Monitoring. Second Annual Report. April 2004.

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Annex I: Contributing projects

Preface This Annex lists all the projects (European and national) which belong to the **Pricing, Taxation and Financing Tools** theme, in alphabetical order of project acronym (for projects with acronyms), followed by projects without acronyms in alphabetical order of the project's name in English. Where results have been made available to the EXTR@Web project, a summary of key findings and policy implications relevant to this theme are given.

In 'Origin' column, use ISO 3166-1 country designators as follows:

Austria – AT; Belgium – BE; Bulgaria – BG; Cyprus – CY; Czech Republic – CZ; Denmark – DK; Estonia – EE; European – EU; Finland – FI; France – FR; Germany – DE; Greece – GR; Hungary – HU; Iceland – IS; International – INT; Ireland – IE; Italy – IT; Latvia – LV; Lithuania – LT; Luxembourg – LU; Malta – MT; Netherlands – NL; Norway – NO; Poland – PL; Portugal – PT; Romania – RO; Slovakia – SK; Slovenia – SI; Spain – ES; Sweden – SE; Switzerland – CH; United Kingdom – UK; Other countries – Oth

Theme: Pricing, Taxation and Financing Tools			Last update: 27 July 2006
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
CARDME-4	Cross-border interoperability of electronic fee collection systems	EU	Urban and road pricing
<u>Project website</u> www.cardme.org			
CUPID	Co-ordinating urban pricing integrated demonstrations	EU	Urban and road pricing, Use of revenues from pricing
<u>Project website</u> www.transport-pricing.net/cupid.html			
<u>Key findings</u> CUPID provided answers to several key questions based on results of evaluations in the 8 cities of the PROGRESS project (Bristol, Copenhagen, Edinburgh, Genoa, Gothenburg, Helsinki, Rome and Trondheim). 1) Who should be charged? Most cities recommend exemptions for cycles, buses, emergency vehicles and disabled drivers. Motorcycles are currently often exempt for practical reasons. 2) Where should road users be charged? If the main objective of charging is to reduce congestion, then city centre or citywide schemes are most appropriate, using cordon charges. If the main objective is "mobility management" then metropolitan area charging is appropriate, using distance-based charging. 3) How should road users be charged? Conventional solutions such as DSRC (Dedicated short-range communication) were preferred. VPS (Vehicle positioning system) is seen as offering a useful alternative in the future, but at present the technology is not sufficiently mature. This severely restricts the feasibility of introducing distance-based charging. 4) How should enforcement operate? Most cities felt that ANPR (Automatic number plate recognition) was the optimum approach. 5) When should road users be charged? Most cities focused on the working weekday, charging either "all day" or solely for the morning peak. An			

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Acronym	Project title (in English)	Origin	Research sub-theme
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Key findings / Policy implications / Project website or contact

issue to be resolved concerns whether charging should be made in the evening.

6) How should revenue be used?
There is a general consensus that revenue raised by road pricing should be used within the transport system (i.e. "hypothecation").

7) How should privacy be ensured?
All cities are concerned about privacy issues but these do not appear to represent a fundamental barrier.

8) What is the best way to introduce road pricing?
All cities recommended that road pricing should be introduced as part of a package of measures, which should include infrastructure investment. All successful schemes in Norway are locally initiated.

9) Why have things not gone the way planned?
The main issues raised were public acceptance / political problems, but others included technical problems and delays in funding alternative access modes.

10) How will you judge whether the scheme is a success?
Mayor Livingstone commented that his re-election would demonstrate that this scheme was a success. A range of other quantitative targets on traffic reduction have been suggested, along with some qualitative targets regarding implementation of a transport package and acceptance.

11) What have you learnt in the process?
Need for a high level of public consultation; need for strong political support; importance of clarity in use of revenues; lack of maturity of VPS / GPS.

12) What are the key factors in your success?
Positive public consultation / discussion; strong political will / agreement: and the example of success of road pricing in other cities.

Policy implications

Pricing is a valid tool for tackling issues of urban congestion and environmental impact. There is a clear case for transparency and accountability in the allocation of revenues; in general hypothecation of revenues within the transport sector is seen as a priority. A strong scheme promoter will be needed to implement the scheme. Top-down political support to local decision-makers is needed if pricing take up is to become widespread in the short to medium term.

Project website

www.transport-pricing.net/cupid.html

D3	Fair and efficient pricing	CH	Fair and efficient pricing
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Key findings

The external costs resulting from road traffic accidents and pollution, not covered by road taxes and other transport-related taxes, amount to a charge on our society of about CHF 10 billion per year, and this burden is likely to increase over time.

'Fair and Efficient Pricing' is the title under which the authors suggest ways to establish the true costs, and to develop a new pricing system that is related to the originators of damaging effects. Action is most urgently required in respect of private road traffic: here, the authors suggest a restructure of the road tax system.

In the long term (from about the year 2005), a tax based on distance travelled could be introduced which would be similar to the tax charged for heavy goods vehicles. A charge of CHF 0.05 per kilometre would cover today's known external costs, and a supplementary charge could be made in urban areas. In return, the fuel tax could be restructured as a CO₂ tax, and reduced.

Rail transport would also have to improve the level of its external cost coverage. Environmental damage could be reduced, through implementation of this pricing reform. For example, CO₂ emissions could be reduced by 5 to 10 per cent, and other hazardous substances reduced by about 15 per cent.

Theme: Pricing, Taxation and Financing Tools		Last update: 27 July 2006	
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
<p>However, in some areas (e.g. emission technology, noise pollution, etc.) regulations, as well as technical and voluntary action, would still be required in order to comply with the legal requirements for the protection of the environment, and international agreements concerning the global climate.</p> <p><u>Policy implications</u></p> <p>The main aspect here is the implementation of a new pricing strategy for road passenger transport (private and public). Transition from the current rather undifferentiated taxation system to a medium to long-term strategy of differentiated road pricing is much more difficult than for road freight transport or rail transport. Implementation involves various problems such as fixing price levels, technical and legal questions, federal and institutional aspects, and last but not least: public acceptance above all of the data protection aspect.</p> <p>The following eight steps form a basis for implementing these proposals in Switzerland. Most important here are the transitional aspects in road passenger transport, based on existing pricing principles, until an appropriate and cost-effective road pricing technique has been developed:</p> <ul style="list-style-type: none"> • Rail reform and rail infrastructure mandate; • introduction of capacity-related trucking fees (HGV km-tax) • private road traffic measures: CO₂ tax; parking charges or zonal road pricing in urban areas; • charges levied on insurance companies; • introduction of km-related fee, new financing funds, earmarked fuel charges abolished; • introduction of km-tax for light duty vehicles and busses; • km-charges converted to road pricing; and • fee differentiation monitoring instruments: comprehensive cost charging Switzerland has a comparatively good basis for cost estimation in the transportation sector. <p>For effective implementation of the proposed pricing strategy, however, additional elements are required taking account in particular of a comprehensive traffic system approach.</p> <p>Priority here is given to comparable infrastructure accounting between road and rail, and a wider basis for environmental cost charging. In the end, marginal costs have to be determined for all areas. This particularly applies to infrastructure cost charging, which soon will be subject to considerable changes in the road transportation sector if the truck weight limit is increased (higher maintenance costs due to increased road deterioration).</p> <p>Here again, the next step will be to include for air traffic as well.</p> <p><u>Project contact</u></p> <p>Markus.maibach@infras.ch</p>			
D9	Funding tomorrow's transport systems	CH	Forms of transport systems funding
<p><u>Key findings</u></p> <p>Every year the Federal Government, the Cantons, and communities spend nearly CHF 30 billion on private and public transport. This study clarifies and analyses these complex financial flows and demonstrates how all these various subsidies actually undermine the economic and responsible utilisation of resources.</p> <p>Redistribution of resources through road financing alone has reached such a level that some Cantons profit by CHF 200 per capita, whereas others lose the same amount, although this redistribution is quite unintentional and unregulated.</p> <p>The authors suggest a reform package with the objective of restructuring these unfathomable flows of finance, and increasing their efficiency. Measures suggested include transferral of motorways operations to independent organisations; simplifying the Federal subsidy system, and increasing support to the cities for</p>			

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Acronym	Project title (in English)	Origin	Research sub-theme
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Key findings / Policy implications / Project website or contact

their public transport responsibilities and treating investments in public transport the same way as operating deficits.
 Combined urban transport authorities are proposed to be responsible for transport-related revenues and expenses within one region.

Policy implications

Reform of transport funding in Switzerland

- The national motorways: managed by firms and funded through user fees; this reform proposal has the following cornerstones:
 - Construction and maintenance of the national motorways will be in the responsibility of managing firms that are independent from the public administration. These firms will get a concession sold in an auction and valid for 10 to 15 years.
 - The managing firms are funded through user fees. The firms have the right to set prices freely. Prices are only subject to the existing regulations on cartels and monopolies.
 - 'Deficit' motorways are equally run by firms and financed through user fees. The remaining deficits are covered by the 'surplus' firms. For this purpose a national motorway fund is created.
 - The network will not be transferred as a whole but partitioned into single lines. Due to density of the network some spatial competition is guaranteed. Competition in time is guaranteed through the limited validity of the concession.
 - The state restricts himself to strategic objectives: Itineraries, rules and terms of reference for the concession, and coordination between the management firms.
 - Fuel and other national taxes are reduced by the user fee revenues. The national taxes then mainly help to finance the grants to the cantons.
- Simplified cooperation between the federation and the cantons in the field of road construction. This reform proposal has the following cornerstones:
 - The present 30 to 40 different grants from the federation to the cantons will be reduced to three. These represent respectively a share of the national taxes, the burden of road construction and maintenance, and financial equalisation.
 - The cantons retain their right to levy a vehicle tax. This allows the population to decide on the tax level and therefore on the level of road construction. Furthermore, the vehicle tax is a kind of 'contribution to the user club'.
 - It is advisable to examine whether the cantons should be funding the municipal road network. This would ease the financial situation of the larger towns and cities.
- Matching grants for regional public transport: The following reform proposal is a 'soft' evolution of the reform of the railway act of 1996. It has the following cornerstones:
 - Federal transfers and subsidies are based on the revenue of the respective transport firms. The grant furthermore allows for the equalisation of different burdens due to the topographic or demographic structure. The grant is limited to a certain level per cantonal inhabitant.
 - Federal grants are extended to local transport. This mainly favours city and agglomeration transport systems which until now were excluded.
 - Investment and current expenditure grants are merged. The cantons are free to use the grants either for covering current deficits or for new investments into public transport infrastructure.
- Special transport bodies in the urban agglomerations: The political entities in the urban agglomerations are founding special bodies for transport purposes. Their task is to coordinate private and public transport, to ensure their funding and a fair redistribution of all costs in the long term. The cornerstones of these reform proposal are:
 - The new special bodies are restricted to the task of organising and funding public and private transport on their territory. The bodies are not necessarily linked to cantonal borders. They are based - subject to a commitment to join - on voluntariness.

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Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
<ul style="list-style-type: none"> The federation elaborates an agglomeration act that sets the standards with respect to democratic control within the bodies, intercantonal or intermunicipal collaboration, funding rules mainly with respect to road pricing, and the commitment to join. The special bodies are self-funded. The principal sources are revenues from the transport firms, revenues from road pricing and some local taxes e.g. on the use of parking lots. In addition, federation, cantons and municipalities are paying some grants. The 'Fund for public transport infrastructure' as investment fund: The 'Fund for public transport infrastructure', adopted in 1998, is currently a pure financial fund. We propose an evolution towards a more active management fund, exerting the function of a go-between the state and the rail infrastructure firms. The task of the existing fund is extended towards an active investment and management role. The basic task of the fund is the funding of the different rail infrastructure firms. The fund grants no subsidies, but only loans during the construction period. The fund may also act as a guarantee for private capital. Construction and management of the new railway projects is handed over to independent firms. The respective firms receive a concession, the terms of reference and ex ante subsidies. The concession is restricted to 10 to 15 years; after this period it can be sold to another firm. The state is restricted to strategic tasks: Elaboration of the terms of reference and the concession, coordination between the infrastructure firms, coordination with the remaining network, and setting the rules for access. <p><u>Project contact</u> bloechliger@bss-basel.ch</p>			
DESIRE	Designs for Inter-urban Road pricing schemes in Europe	EU	Urban and road pricing
<p><u>Key findings</u></p> <ul style="list-style-type: none"> IPRS state of the art. The added value of this result is also linked with its potential role in future projects and discussions concerning IRPS issues at national and/or international level. Model Designs of Possible IRPS. This result provides a detailed definition of different basic forms of IRPS and a discussion of the technical systems and institutional dimensions that support the implementation of these IRPS. It includes: <ul style="list-style-type: none"> A common basis of the analysis - this concerns the objectives and basic forms of IRPS, the pricing principles and, most important, the functionality of an IRPS; The discussion of possible technical and procedural solutions - this discussion is focused on solutions for the two mileage-dependent schemes DAREA and NET; The definition and assessment of possible institutional solutions - shows that there is not the one institutional model, but depending on the weight given to different objectives, an All Public, a Mixed or an All Private Model are conceivable. This output also includes an Excel toolkit for self-assessment of country situation and feasibility assessment regarding introduction/ implementation of IRPS. Framework for Assessment of Country Situation as Regards IRPS. This result is mainly concerned with the feasibility of different types of IRPS under different transport environment characteristics (national contexts). This analytical framework was also designed in order to provide better knowledge on the conditions under which a common or an interoperable European concept(s) can be introduced. This detailed specification and methodologies for the analysis of country situation is of strong relevance road authorities since it can provide information on strategies and conditions for successful implementation of IRPS. 			

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- **Impact Analysis of IRPS Methodology.** This result consists in the design and test of a methodology for impact analysis supported by a (calibrated) network model that allows a sound understanding of the actual circumstances affecting the feasibility of possible IRPS designs as well as possible patterns in their evolution. The basic assumption is that the effect of IRPS should be in compliance with the set of policy goals and political agreements made in the past. Through the running of the referred network-based transport model the bulk of impacts has been identified, which has allowed to analyse in a systematic way how such indirect impacts are dynamically passed through regional economies and may eventually impact on both macroeconomics performance and long-term environmental sustainability.
- **Best Functional IRPS.** This result consists in the identification of the most appropriate IRPS for the European situation, which has major importance in the context of the goals of the Common Transport Policy, particularly in what concerns to the necessity to guarantee interoperability of electronic road pricing schemes. Of particular relevance is the exploration of implementation (transition) paths that can serve the purpose of identifying IRPS options that support the aim of future European interoperability and implementation of increasingly 'sophisticate' pricing policies.

Policy implications

- There is a considerable diversity of objectives and framework conditions surrounding the introduction of road tolls. Part of those objectives and conditions are dynamic, but others are rather stable, so there is and there will be for a long time legitimate reason for diversity of tolling strategies by national governments.
- Prices are just one of the types of instruments in support of transport policy (the main others being supply [infrastructure and technology] and regulation [technical and economical]). In search for an optimal intervention on the transport system, governments should remember the availability of these three types of instruments.
- Just like companies in a market try to recur to different combinations of production factors to find their spaces of competitiveness, so do national governments recur to different combinations of those instruments to find situations where their transport systems may promote the competitiveness of their economies. This search has to be done in respect of some basic rules of the European Union, like the principle of territoriality and the promotion of the Internal Single Market and reduction of barriers to trade, of which free access to markets and a strong harmonisation of technical regulations are necessary supporting elements.
- Identity of transport prices would make sense if countries were facing identical situations of density and sophistication of supply of transport infrastructure and services, and of density of demand, i.e. ultimately of identical situations of population density and purchasing power, which clearly is not the case in Europe;
- It is recommended that ownership of transport infrastructure stays in public hands, as well as the decision to build it and to what standards; the State should ensure independent audit of the processes of revenue collection and application, as well as of the processes of handling customer complaints.
- There are technological solutions available to allow comfortable and transparent application of EFC in the various tolling schemes studied. The choice of the most adequate technology depends not only on the basic form of tolling (NET vs. DAREA) but also:
 - for a NET scheme on whether tolling has been considered in the design of the motorways or not (retrofitting),
 - for a DAREA scheme, on the main objectives underlying the introduction of the tolls, and with them the need for variability of tariffs (i.e. time modulation of the tariff or higher tariff levels in more sensitive areas),
 - for any scheme, on the desired other functions to be developed on top of the tolling technology,
 - for any scheme, on the transaction costs and enforcement difficulties associated with the various technologies;

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<ul style="list-style-type: none"> The project has included an analysis, not only about the circumstances in which tolls should be introduced, but also in which an existing tolling regime should be changed. In both cases, the analysis includes recommendations on how to manage those changes. There are possible important contributions from the EU in the short and medium term: <ul style="list-style-type: none"> to impose open specifications for on-board units (OBU) in all countries, to encourage convergence of standards in the GPS/GSM platform (as it has done for the DSRC plat-form), to encourage convergence of vehicle classification. <p><u>Project website</u> www.tis.pt/proj/desire.htm</p>			
H025A	Surface transport costs and charges	UK	Real transport costs – internal and external
<p><u>Project website</u> www.rmd.dft.gov.uk/project.asp?intProjectID=9370</p>			
IMPRINT EUROPE	Implementing pricing reform in transport effective use of research on pricing in Europe	EU	Fair and efficient pricing
<p><u>Key findings</u></p> <p>The key areas in which the Imprint-Europe thematic network reached conclusions are:</p> <ul style="list-style-type: none"> Measurement of marginal social cost: <ul style="list-style-type: none"> most countries have some information suitable for setting more efficient charges , though the disagreements and uncertainties identified above serve as a barrier to estimation of charges according to a common basis, a likely way forward is to seek consensus on a lower limit of costs that should be reflected in price, raising this as evidence becomes stronger and more accepted. Acceptability and phasing of pricing reform: <ul style="list-style-type: none"> acceptability tends to be higher where problems are particularly acute and demonstrable, where there is an identified package of complementary measures and where revenue use is transparent and/or earmarked, making simple and modest reforms first, progressing towards more sophisticated charging systems, can address concerns about reform, each new phase of reform should generally move prices in the right direction in terms of the ultimate goal, even if short term considerations might dictate otherwise, Drawing on experience and research, ten steps to implementation have been identified to serve as a guideline for policy-makers. Key Issues for Newly Associated States <ul style="list-style-type: none"> there is a strong link with financing: financing needs are more acute, and other sources of finance more limited, so pricing is seen very much as a way of financing investment, issues concern transit traffic and peripherality; there is a risk that NAS countries incur substantial costs to improve infrastructure for transit traffic but cannot recover this in price because of low congestion. <p><u>Policy implications</u></p> <p>A start has been made in some sectors: for instance the Rail Directive contained a sensible pragmatic approach to marginal social cost based pricing, and the proposed revised Eurovignette Directive was a step</p>			

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<p>in the right direction, although still containing many constraints which would prevent fair and efficient pricing of road freight vehicles.</p> <p>However much disappointment was expressed that the proposed framework directive and common methodology paper for all modes seems to have been abandoned. It is felt that such a directive would be an important step forward as it would provide a clear objective towards which pricing reform should be concentrated on all modes, and encourage transparency in the setting of prices. In its absence areas where reform is most needed were identified as:</p> <ul style="list-style-type: none"> • Congested urban areas; • trans-European road and rail corridors; • aviation; and • ports. <p>Processes and institutions need research - what bodies should set or regulate prices and be responsible for allocating the revenue? How do prices feed through to and impact upon end-users? Institutional issues are particularly complex in the aviation and maritime sectors.</p> <p><u>Project website</u> www.imprint-eu.org</p>			
MC-ICAM	Implementation of Marginal Cost Pricing in Transport - Integrated Conceptual and Applied Model Analysis	EU	Fair and efficient pricing, Use of revenues from pricing
<p><u>Key findings</u></p> <p>The MC-ICAM studies on barriers and constraints and the modelling case studies produced a great number of results and insights relevant for designing how the implementation should progress in the key dimensions of the pricing system.</p> <p>(1) Sensible phasing and packaging of simple pricing measures with limited scope, relatively low charges and minimal differentiation can lead to substantial benefits already in early phases. Waiting for the ideal solution to be possible is no good excuse for not acting: the best strategy from the welfare viewpoint would be to start implementing with what is feasible now.</p> <p>(2) A careful choice for the initial steps of implementation is extremely important for building up acceptability for more comprehensive and sophisticated developments later on. This works both through demonstrating the benefits and increasing confidence.</p> <p>(3) Scope of the pricing system. It is best to start with pricing measures or schemes that have a limited scope but which focus on areas and aspects/issues where problems are most acute. In road transport such simple schemes can be e.g. cordon tolls or km charge for HGVs with limited scope and minimal degree of differentiation. One can move to the more comprehensive schemes only in the medium and long run as confidence and acceptability builds up.</p> <p>(4) Level of charges. Increases in charges need to be gradual; It is often stressed that it is important that each new step improves overall social welfare and is not perceived as moving backwards. A particular problem here from the viewpoint of implementation is to protect implementation paths from erosion that may occur when new elections take place during the execution of the path.</p> <p>(5) Composition of charges. Appropriate packages of measures within and across modes are important for both efficiency (welfare) and acceptability. In an intermodal context this may mean e.g. environmental charges on all modes at once.</p> <p>(6) Degree of differentiation. The urban case studies showed considerable social benefits from differentiation of prices over time (peak and off-peak). The interurban case studies showed that geographic differentiation is likely to have remarkable social benefits and significant impacts on modal shares. But the studies also showed that differentiation is likely to benefit those (here road freight) who are the object of pricing.</p>			

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<p>(7) Use of revenue is crucial. The best use of revenue from the welfare perspective would be to reduce other distorting taxes, such as taxes on labour. However, the problem is that these tax reductions would be widely spread and would not be perceived as a benefit of the pricing reform. It may be necessary – in the beginning at least – to accept a less than optimal use of revenue in order to provide clear benefits to the losers and to buy off their opposition.</p> <p><u>Policy implications</u></p> <p>Urban In urban transport, where problems are acute and benefits of implementation clear, it is likely to be possible to move straight to higher prices and more complicated schemes than when this is not the case. Thus we would expect to see the biggest most congested cities moving straight to fairly high charges and quickly to reasonably sophisticated schemes. Smaller cities with less acute problems may never progress beyond simple low cordon tolls.</p> <p>Interurban roads Many countries are reluctant to impose motorway tolls themselves because of possible diversion to other roads, and thus need a more sophisticated system of charging heavy goods vehicles. If they do move to a GPS based system, the technology is then in place both for added sophistication of HGV charging (by time and place) and the extension of charging to all vehicles. Where the geography of the country involves large cities at relatively large distances (Spain, France) a continued reliance on motorway tolls may be more adequate.</p> <p>Rail, air, water In the rail, air and water sectors, the stronger competition and the more acute capacity problems the more sophisticated a system is likely to be both justified and acceptable.</p> <p><u>Project website</u> www.mcciam.net</p>				
MD/DD/16	Legal remedies to foster sustainable mobility in urban and suburban areas	BE	Urban and road pricing	
<p><u>Project website</u> www.belspo.be/belspo/fedra/proj.asp?!=en&COD=MD/DD/16</p>				
PISTA	Pilot on Interoperable Systems for Tolling Applications	EU	Urban and road pricing	
<p><u>Project website</u> www.pistaproject.com</p>				
PROGRESS	Pricing Regimes for Integrated Sustainable Mobility	EU	Urban and road pricing	

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<p><u>Key findings</u></p> <p>The main results can be grouped under four headings, as follows:</p> <ul style="list-style-type: none"> • Legal, organisational and financing issues <ul style="list-style-type: none"> • A national legal framework for urban road pricing is in place in Norway, Italy and the UK but does not exist in Denmark, Finland and Sweden, • key issues to define the organisational framework are procurement route decided by the project management board (and ratified politically), management systems to be adopted and the role of central government support (both financial and technical), • options for the system management are: fully managed in-house, joint venture with the private sector, management through a concession; • Consultation, marketing and press coverage issues <ul style="list-style-type: none"> • acceptance and understanding of a scheme will promote desirable changes in travel behaviour; • a reasonable level of acceptance will minimise the risk of undesirable responses such as extensive violation of a scheme. • Charging technologies <ul style="list-style-type: none"> • a range of technologies has been tested in demonstrations providing valuable information on technological performances, • basic concept for urban road pricing is a cordon where vehicles are charged per trip or per day, this can be further developed into a zone system, • an alternative is to charge car users by distance travelled in the charging area, where the charge can be differentiated by time of day, vehicle type, and users group. • Charging scheme impacts <ul style="list-style-type: none"> • overall benefits have been obtained in terms of congestion reduction and environmental impacts while maintaining minimal boundary congestion levels as a side effect, • maximum benefits are achieved if combined with complementary measures. <p><u>Policy implications</u></p> <p>Main recommendations are:</p> <ul style="list-style-type: none"> • Road pricing needs to be presented as part of a strategy, including other measures, to solve congestion; • communication needs to be clear with emphasis on providing information on the scheme objectives and its traffic effects; • close communication is needed with businesses and stakeholders so that their fears and concerns can be mitigated; • distance-based systems give higher flexibility for transport policy and GPS technology is well suited for such systems but this is however not mature; • effects of road pricing on social equity need to be assessed together with other pricing tools such as costs for parking, public transport fares as well as Park and Ride. <p><u>Project website</u></p> <p>www.progress-project.org</p>			
RECORDIT	Real Cost Reduction of Door-to-door Intermodal Transport	EU	Real transport costs – internal and external; Economic instruments

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<p><u>Key findings</u></p> <p>With information about the private (internal) and social (external plus internal) costs of intermodal transport and its competitor - road freight transport, it was possible to identify how and why this gap varies in different parts of the European transport network. The final results of the project inform the debate on "fair and efficient pricing", and show the necessary charges (taxation) that are required for road and rail transport in different countries in order to meet those twin objectives of efficiency and fairness.</p> <p><u>Project website</u> www.recordit.org</p>			
REVENUE	Revenue Use from Transport Pricing	EU	Use of revenues from pricing
<p><u>Project website</u> www.revenue-eu.org</p>			
SPECTRUM	Study of policies regarding economic instruments complementing transport regulation and the undertaking of physical measures	EU	Economic instruments
<p><u>Project website</u> www.its.leeds.ac.uk/projects/spectrum/</p>			
SVI 1999/317	Taxation of cars with a bonus-malus system	CH	Economic instruments
<p><u>Key findings</u></p> <p>The theory of price sensitivity holds that the impact of a bonus/malus system in terms of CO₂ reduction will be relatively modest. In the case of the approaches studied here and the maximum values adopted the annual reduction of CO₂ is in the range of a few points per thousand. The method is indeed appropriate only to a limited extent for this kind of research, for in the first place the experimental values adopted for the "price elasticity" parameter lack a solid basis, and secondly the impact of the flanking measures (e.g. on the behaviour of dealers) cannot be determined. However on the basis of complementary plausibility considerations and canton Lucerne's experience with a tax rebate it can be safely concluded that a significant reduction of CO₂ emissions is a realistic expectation. Given the likely progress of the technology involved, the CO₂ reduction objectives of the federal CO₂ law may thus be considered realistic. Extensive secondary effects are to be expected from any bonus/malus system applied to automobiles, which in general can be credited to the public's increasing awareness of the CO₂ problem. These range from a more energy-saving behaviour when behind the wheel (Ecodrive) to greater utilisation of public transport, the avoidance of unnecessary journeys, and greater use of renewable sources of energy.</p> <p><u>Policy implications</u></p> <p>There are a number of important administrative details to consider when introducing a bonus/malus system. These fall mainly into the following three categories: creation of the necessary legal basis, data collection, setting target values and adapting these. The problems likely to arise are all solvable however. The cantonal highways authority is the most suitable choice for implementation.</p>			
<p><u>Project contact</u> Urs.schwegler@bluewin.ch</p>			

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SVI 2000/442			
	Evaluation of short-term raises in gasoline prices	CH	Economic instruments
<u>Key findings</u>			
<p>Fuel market reactions: The market price changes happened 1999 in a period with high economic growth. Thus the influence of the income (GDP) is predominant. We estimated an income elasticity of 0.65. That means, if GDP is growing (ceteris paribus) by 10%, fuel sales will grow by 6.5%. The influence of the price increase itself is less predominant. The sales decreased especially in the year 2000 (in total by 8%, compared to 1999). It is only possible to show a significant influence of the price increase, if one considers delayed market reactions. The analysis confirmed such an effect. Assuming a one year delay, the econometric analysis results in a price elasticity between -0.3 and -0.4, that means: fuel sales are decreasing by 3 to 4%, if fuel market prices increase by 10%. Other impacts: The fuel market reaction are comparable with the change of traffic volumes. In general, the traffic volumes develop similarly as the fuel sales. The analysis showed some deviations at the borders and other interesting differences:- The price changes had lower impact on traffic volumes on highways compared to other roads.- Weekend traffic volumes showed a bigger change than weekday volumes. That might be an indication, that leisure traffic is more price sensible. The impact on the car market was analysed by a survey of car sellers. According to them, specific fuel consumption of cars is no important marketing criteria. Most important criteria are comfort, space and equipment, car safety and motor power. Thus car sellers could not observe a significant change in car demand. The most important impact is the strong increase of diesel cars, but this effect can be observed since 1993.</p>			
<u>Policy implications</u>			
None.			
<u>Project contact</u>			
Markus.maibach@infras.ch			
TELEPAY			
	Telepayment system for Multimodal Transport Services using Portable Phones	EU	Urban and road pricing
<u>Key findings</u>			
<p>The main results of the project were:</p> <ul style="list-style-type: none"> • The assessment of the technical and commercial feasibility of using portable phones for the payment of transport services. • A comparison of the different approaches for payment using GSM demonstrated in the different TELEPAY test sites. This comparison included all important aspects such as technical feasibility, user acceptance, ease of use, business case, legal and institutional appropriateness. • The production of different model contracts in different constellations. 			
<u>Policy implications</u>			
<p>This new TELEPAY ticketing and payment framework leads to the need to establish adequate contracts between actors in order to define clearly contractual roles and responsibilities. Furthermore, the need to link together different actors with different features and aims raises the need of different contracts. The huge differences in the relationships between parties oblige the Transport Operator to be aware of the whole system. This means that Transport Operators should hold some degrees of control even on contracts in which they are not directly involved, but that could affect the proper functioning of TELEPAY. In addition, these new contracts will have to respect national and international legal and operation framework such as privacy, protection of customers, payment means, roaming for value added services. Most of</p>			

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<p>these issues need to be addressed at the EU level to develop a harmonized TELEPAY concept that will ensure an easy and wide implementation of the service.</p> <p>From the results of the project and the experience gained during trials, several issues have been identified and need to be addressed for a future EU-wide implementation of TELEPAY concept.</p> <ul style="list-style-type: none"> • Adaptation and harmonization of legislation with mobile telecommunication and mobile payment for a EU-wide service Operational Framework • Extension of roaming to value added services to make the TELEPAY service independent from localization and telecom operator • Improvement of payment means by giving more choices to customers • Development of micro-payment at low cost and high reliability at European scale, both on legal and standardization aspects • Integration of TELEPAY ticketing and payment service with information services such as by order of priority timetable, real-time information route information and tariff information • Ticket evolution from SMS to MMS (Multimedia Messaging Service) • Next generation of mobile telecommunication (UMTS) • Improvement of the use of short range communication such as Bluetooth. <p><u>Project website</u> www.ertico.com/activiti/projects/telepay/home.htm</p>			
UG346	Monitoring Effects of Road User Charging in Durham	UK	Urban and road pricing
<p><u>Key findings</u></p> <p>The Durham City Forum agreed to a road user charging scheme that had an aim ‘to significantly reduce its vehicular and pedestrian conflict by removing a substantial proportion of existing traffic’. The scheme had to deliver: Improved Pedestrian Safety; Improved access for disabled; Enhancement of the World Heritage site; And the preservation of the viability of the Peninsula as a working part of the City Centre. The project contributes to the pricing, taxation and financing tools theme, especially in relation to the topics of road user charges. The project particularly deals with the sub themes of: urban and road pricing, such as a demonstration of urban pricing schemes and their evaluation, and recommendation for implementation of urban and interurban road pricing schemes. Thus for example the study describes the following findings:</p> <ul style="list-style-type: none"> • Following consultation with the public a £2 charge for vehicles using Saddler Street and the Market Place during a defined period of 10 am and 4 pm Monday to Saturday was introduced. This was considered to be a sufficient deterrent when considering that the main area for vehicle reduction lies within those undertaking short duration shopping or commercial activities. This period was chosen as it coincided with peak pedestrian flows. It was also agreed that, to allow ease of use of permits by visitors, and to ensure no build up of congestion occurred at the access point, the control and payment collection should be on exit rather than on entry. • The key successful results of the Durham road user charging scheme have been the following before and after statistics: 85% reduction in vehicular traffic 10% increase in pedestrian activity 48% reduction in the number of delivery vehicles entering Saddler Street between 9.00 am and 5.15pm. Steady increases in use of Cathedral Bus. 10% increase (to 78%) in number of people who consider Durham City Centre to be a safe place to visit. 21% increase (to 70%) in number of people who believe the Road User Charge is a good idea. 83% of businesses have not altered their servicing arrangements following introduction of the Road User Charge. • Since introduction of the scheme on 1st October 2002, the aim set out by the forum has been achieved and the objectives delivered. Decreases in vehicular activity lead to reductions in vehicle emissions, noise and visual intrusion enhancing the World Heritage Site, Cathedral and Castle. Environmental im- 			

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<p>provement has encouraged a 10% increase in pedestrian activity since introduction of the Road User Charge. Public perception of the scheme has improved significantly following its introduction. This is in line with the experiences at other sites around the world, like Trondheim in Norway where negative responses to the toll during attitudinal surveys fell markedly after the implementation of the scheme. Further monitoring will be necessary before the overall long-term affects of Road User Charging in Durham can be clearly identified. However, early indications are that the scheme is having positive benefits for Durham City Centre.</p> <p><u>Policy implications</u></p> <p>The main policy implication of this research is that targeted road user charging, whilst unpopular at the outset, achieves significant reductions in levels of congestion and environmental pollutants whilst at the same time encouraging an upward trend in public transport patronage.</p> <p><u>Project website</u></p> <p>www.rmd.dft.gov.uk/project.asp?intProjectID=9235</p>			
UG376	Evaluating rural bus grant and rural bus challenge	UK	Forms of transport systems funding
<p><u>Project website</u></p> <p>www.rmd.dft.gov.uk/project.asp?intProjectID=11349</p>			
UG431	Congestion charging – Tools for dialogue	UK	Urban and road pricing
<p><u>Project website</u></p> <p>www.rmd.dft.gov.uk/project.asp?intProjectID=11353</p>			
UNITE	Unification of accounts and marginal costs for Transport Efficiency	EU	Real transport costs – internal and external; Fair and efficient pricing
<p><u>Key findings</u></p> <p>The main conclusions about cost estimation methodologies have been:</p> <ul style="list-style-type: none"> • Congestion cost estimates have been produced for road, rail and air transport, but the latter two modes are little researched and more evidence is needed; • scarcity costs – the value of creating or taking up a path or slot in a capacity-constrained network – are even less well understood and remain a priority for future research; • a new methodology developed for accident costs which distinguishes between external and internal costs leads typically to lower estimates than previous studies; • the impact pathway approach for the measurement of environmental costs appears as the only reliable but transferability (except for the costs of global warming) appears limited. <p>A major result of the UNITE project is the development of the so-called pilot accounts for all transport modes in all EU countries, Switzerland, Estonia and Hungary:</p> <ul style="list-style-type: none"> • They show the social costs (the cost of infrastructure, accidents, environmental damages, delays and the costs of supplying transport services) and the revenues from taxes, charges and subsidies of transport for two analysis (1996, 1998) and 1 forecast year (2005); • for road, total revenues cover total infrastructure costs in all countries except for Hungary; • in more then half of the countries studied, the total revenues exceed the total costs of infrastructure, accidents and the costs of air pollution, global warming and noise; • the degree to which rail system costs are covered by revenue from passengers and freight differs substantially between the countries studied, from a maximum of 63% (Finland) to a minimum of 8% (Hun- 			

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<p>gary);</p> <ul style="list-style-type: none"> it should not necessarily be concluded that rail transport is under priced relative to road as in terms of efficiency it is necessary to look at the marginal costs: the marginal cost case studies imply that marginal cost of rail transport is very much below the average cost, while the reverse holds for congested roads. <p>Results from the TRENEN partial equilibrium model have shown that:</p> <ul style="list-style-type: none"> Maximum benefit would be obtained by marginal social cost pricing; the second best pricing policy is Ramsey pricing and average cost pricing is worst; compared to the current situation, average cost pricing typically reduces taxes on road traffic and raises public transport fares. <p>Results from general equilibrium models for Belgium and Switzerland have shown that:</p> <ul style="list-style-type: none"> The most efficient use of revenue is to reduce labour taxes, benefiting the better off; average cost pricing makes all groups worse off; marginal social cost pricing produces a small but negative indirect economic effect. <p><u>Policy implications</u></p> <p>The project concluded that:</p> <ul style="list-style-type: none"> It is the use of case study and accounts data together which is likely to be the most practical means of generating marginal cost estimates which feed into pricing policy; the creation and maintenance of a set of consistent social accounts for the transport sector is particularly valuable for monitoring the impacts of policy, including pricing policy; consideration of how much revenue to raise within the transport sector needs examination of sources and uses of revenue elsewhere in the economy; where budget constraints are needed, they should be implemented flexibly, with provision for cross subsidisation between modes, if they are to do least damage to economic efficiency. 			
<u>Project website</u>			
www.its.leeds.ac.uk/projects/unite/			
–	Alternative urban transport funding: Cost-benefit analysis of alternative public transport funding in four Norwegian cities	NO	Forms of transport systems funding
<u>Key findings</u>			
<p>One of the main conclusions from the study is that the urban environment, like housing density, parking restrictions or road user charging will play an important role as a funding element for urban public transport. However, “road pricing” will have a mixed effect; the subsidy demand will increase by 7.3 million euro in the short-term and the optimum level will decrease by 24 million euro in the long-term.</p> <p>Four reports were compiled in this project. Relevant ones relating to financing tools are:</p> <ul style="list-style-type: none"> A study of what preferences politicians and decision-makers have for different funding packages for the largest cities in Norway - looking at general preferences for shared funding of policy packages, at the contents of the packages, and at who should participate in the shared funding. Framework conditions and development trends for the funding of public transport in the largest cities were studied. The main focus is on how public transport adapts to changes in funding framework conditions and on the demand effects of such adaptations. Finally, there was a study on how an economically optimal public transport service can be developed. Various 'second best' solutions were analysed, revealing the social economic benefits of dissolving some of today's funding constraints. 			

Theme: Pricing, Taxation and Financing Tools		Last update: 27 July 2006	
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
<p><u>Policy implications</u></p> <p>Even though an optimal public transport service presupposes increased subsidies, the converse is not necessarily true. More subsidies do not automatically generate an economically optimal service. The public transport companies will operate according to standard business criteria, maximising their own profit rather than the social economic benefit. Even the authorities will not necessarily recognise how the service should be developed in order to achieve an economic welfare optimum.</p> <p>The question is therefore whether it is possible to find an optimal funding mechanism for the public transport companies, which reconciles the incentives of the public transport companies with the socio-economic objectives of the authorities.</p> <p>One example tested in the model shows it will result in 23% more passengers and an economic benefit of around NOK 1.3 billion per annum. An optimal incentive structure must be fine-tuned to a degree which is beyond the scope of this project. These analyses show nonetheless that output based funding for the four largest cities can produce significant economic benefits and increased ridership, even when we use relatively simple and homogeneous incentives for all the cities.</p> <p><u>Project contact</u> jbe@toi.no</p>			
–	Impact of personal taxation system on modal choice	UK	Economic instruments
<p><u>Project website</u> www.rmd.dft.gov.uk/project.asp?intProjectID=10480</p>			
–	Multi-modal freight model for distance-based HGV charging	UK	Fair and efficient pricing
<p><u>Key findings</u></p> <p>The GBFM, Great Britain Freight Model, is an evolving computer program designed to analyse freight traffic flows in Great Britain. It combines a number of data sources and computer algorithms within a single system and applies simple micro-economic rules, seeking to explain the distribution of freight traffic, including commodity, mode, and route. Created in January 2002, this version of GBFM was commissioned by the DfT, to address the need to link specific costs, such as road user charges to the GBFM, and became known as GBFM version 4. This modelling tool incorporates the following 'pricing, taxation and financing tools' topics: infrastructure costs; urban transport pricing; interurban road pricing schemes; multi modal transport; user acceptance; social marginal costs; road user charges; taxation of services; provision of transport services; national road pricing schemes; taxes, charges and tariff structures to influence transport demand and travel patterns; transport modes, financing schemes, freight transport, and passenger transport.</p> <p>In particular, the model:</p> <ul style="list-style-type: none"> • Covers international and domestic freight flows, concentrating on average to long distance shipments. • Generates multi-modal paths by combining network and freight service data. • Employs "accounting" models of transport costs, designed to reproduce realistic freight rates for given trip chains. • Attributes utilities (or negatively, generalised costs) to multimodal network paths, adding time based and reliability-based costs to the calculated freight rates. 			
<p><u>Policy implications</u></p> <p>Policy instruments such as vehicle taxation, road user charging, freight grants and revenue support, fuel</p>			

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Theme: Pricing, Taxation and Financing Tools		Last update: 27 July 2006	
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
<p>taxation, and legislation covering drivers' hours can be represented as part of a forecast scenario. Outputs can be analysed in terms of mode split, regional impacts, and changes in demand for infrastructure. These can also be translated into values suitable for transport appraisal, such as changes in external costs and user benefits.</p> <p><u>Project website</u> www.rmd.dft.gov.uk/project.asp?intProjectID=10046</p>			
–	New models for funding of transport infrastructure services	FI	Forms of transport systems funding
<p><u>Key findings</u></p> <p>In its development proposal for the funding of transport infrastructure services, the Working Group has adopted a stepwise model in which the preceding stages provide the foundation for implementing the subsequent stages. The stepwise model is applied primarily to developing the funding of road traffic: from taxes aimed at steering behaviours and from the development of budgeting for basic maintenance of transport infrastructure, the next step is to proceed to tax-like charges and ultimately to pricing based on geographical positioning.</p> <p>The funding of rail infrastructure services will only be developed in the first stage. It is estimated that the whole development path can be covered within the space of some 15 years. The Working Group's proposal is based on the assumption that fiscal taxes will be substituted by new fixed and variables charges without any significant change in the overall burden placed upon the transport service user.</p> <p><u>Project contact</u> jari.kauppila@mintc.fi</p>			
–	Optimal sizing and container terminal and fare efficiency	IT	Fair and efficient pricing
<p><u>Project website</u> cofin.cineca.it</p>			
–	Positive effects of road tolls	SE	Urban and road pricing
<p><u>Project contact</u> info@transek.se</p>			
–	The value of time in traffic models	DK	Real transport costs – internal and external
<p><u>Project contact</u> oan@ctt.dtu.dk</p>			

Annex II: General information on the Transport Research Knowledge Centre and analysis process used

The Knowledge Centre's background

The EXTR@Web project – Exploitation of Transport Research Results via the Web – attempts to collect, structure, analyse and disseminate transport research results, covering not only EU supported but also nationally financed research in the European Research Area (ERA), as well as selected global transport RTD programmes and projects.

The EXTR@Web consortium has brought together eight main contractors to combine strong and in-depth technical knowledge of transport technology and of EU and national transport RTD programmes with solid communication and dissemination experience.

The current project's direct predecessor, EXTRA (a Fourth Framework Programme Transport RTD project), co-ordinated dissemination activities on the European level for the first time. While FP4 addressed transport research on a mode-by-mode basis, the current Fifth Framework Programme (FP5) focuses on generic themes that consequently reflect transport policy objectives.

The EXTR@Web project will provide support to research at European and national levels by building up and promoting an electronic hub. The key objectives are:

- To establish a comprehensive web-based Knowledge Centre, providing structured and timely access to both detailed and user-oriented summary information on transport research programmes and their results across Europe;
- to provide an electronic hub for inter-connecting European and national programmes and individual networks concerned with transport research into an easily navigable European network;
- to establish a common best practice scheme for the structure and content of the reporting of transport research results;
- to provide high-quality analytical outputs that are structured and tailored according to the type of stakeholder and medium; and
- to raise awareness of the new service, the implications of emerging results, and the wider opportunities under national research programmes across Europe as a whole.

EXTR@Web will provide a comprehensive pool of programme, project and results related information to users, principally in electronic format via the Internet. The approach is based on three main strokes of work covering:

- Monitoring, analysis and information preparation;
- website and electronic news service, the principal dissemination channels; and
- management of knowledge transfer, including dissemination by non-electronic means, and also the maintenance of a contact database and e-mail enquiry service and evaluation of the performance of EXTR@Web.

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Definition of transport research

For inclusion into the Transport Research Knowledge Centre, Transport research programmes and projects have to be within the definition of research and transport simultaneously. This will define the eligibility of projects.

Definition of research

General OECD definition:

"Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications."

Additional transport research criteria:

- Targeted – in line with transport policy aims, strategies and processes to solve the inherent problems for society.
- Accessible – a public activity, open to scrutiny by peers.
- Transferable – useful beyond the specific research project, applicable in principle to other researchers and research contexts as well as decision-makers in policy, industry and science.

Definition of transport

In order to clarify expectations from the Transport Research Knowledge Centre, and to ensure a common understanding of important terms, the Programme Analysis Group of EXTR@Web has come up with the following definition of transport.

- Transport is the means by which a person or material of any kind is passed from its origin to its destination.
- Transport comprises:
 - the transport users: passenger, business, freight;
 - the transport vehicles (full life cycle issues);
 - the transport infrastructure (full life cycle issues);
 - the transport system: the interaction of users, vehicles and infrastructure;
 - the impacts of transport: contribution to objectives, and hence to overall sustainability; and
 - the transport tools: methods and instruments to help ensure an effective contribution to the objectives.

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Three levels of analysis

Project level analysis

For European, national and international projects the following harmonized process was agreed:

- For each eligible project, the project co-ordinator will be requested to draft a Project Profile;
- the EXTR@Web consortium identifies, for each project all relevant themes (typically up to five), and provides the project linkage;
- for each eligible project, the project co-ordinator will be requested to draft the other elements of the reporting scheme – Progress Summary and Result Summary – due to the project progress and provides the final report;
- projects with highest relevance and best available final results will be selected for analysis;
- for every such relevant theme within each project a short and concise paragraph – structured with bullet points as appropriate – will be written to present the key findings of the project in relation to the objectives of the theme; and
- this information will be searchable on the Knowledge Centre website.

Thematic analysis

The thematic analysis has been exploiting existing project level analysis. The consolidated project wise findings have been structured and analysed along 30 themes, which are fixed for the project life time and fed into annual Thematic Research Summaries and Annual Compendia. However, for reporting purposes Thematic Research Summaries have been limited to 28 volumes (cf. Chapter 1).

The sequence of outputs has been comprising an explanation of the overall structure, and regular reports treating national, European and international research in a comprehensive way.

Deliverable number	Title	Release date (final version)
D2.A	"Thematic structure and definitions – all themes"	August 2006
D2.B	"European, national and international project database"	July 2006
D2.C	"First annual thematic research summary"; 30 vol.	December 2004
D2.D	"Second annual thematic research summary"; 10 vol.	March 2006
D2.E	"Third annual thematic research summary"; 28 vol.	August 2006

Table: The sequence of deliverables

Policy level analysis

Whilst the 30 themes are fixed, this type of analysis should give the flexibility to provide information on ad hoc policy priorities. Hence, policy level analysis will synthesize key findings of projects across combinations of themes. As an output, policy brochures shall be prepared depending on ad hoc requirements by DG TREN or by the high-level Advisory Group (AG).

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Annex III: Editorial team for Thematic Research Summaries

Please note that – in principle – all EXTR@Web partners and sub-contractors will be contributing to a particular Thematic Research Summary because all project level findings that are of some relevance to one of the 28 (30) individual themes are presented in the comprehensive format of these papers.

The following summary of authors and peer reviewers is presented in alphabetical order while the main author of this paper is given on page i of the document.

Fabien Dreveton, ISIS; France

Mr Dreveton has an electrical engineering post-MSc degree, an MBA and over 8 years experience in Intelligent Transport Systems for road transport. He has been a senior engineer with ISIS since 2001, specialising in traffic control, motorway management, ITS standards development process and system architecture.

Co-author: Road Transport

Prof J Augusto Felício, Neptune – CEGE/ISEG; Portugal

Professor Felício, holding a PhD in management, is teaching graduate and post-graduate courses such as 'Maritime transport and port management' and 'Land transport and logistic management' at ISEG, School of Economics and Management (Technical University of Lisbon). His activities include participation in transport research where he has published several related articles and books.

Main author: Waterborne Transport, Intelligent Transport Systems

Peer review: Efficiency, Vehicle Technology

Dr Paul E Firmin, Institute for Transport Studies, University of Leeds (ITS); UK

Dr Firmin has 30 years of experience in transport planning and engineering, including local authority, consultancy and academia. His research specialities are: traffic management, transport survey design & analysis, traveller information systems; driver route choice behaviour and transport telematics. He is currently the MSc(Eng) degree programme leader and international student adviser at ITS, University of Leeds. He teaches computing skills and traffic management, and supervises student dissertation projects.

Main author: Information and Awareness

Peer review: Safety and Security

Dr Nils Gendner, Neptune – University of Bremen, ISL; Germany

Dr Gendner has been working for more than four years at the University of Bremen, Institute of Shipping Economics and Logistics. His main topics include the analysis of processes, functions and data flows in shipping and within the rail sector. He contributes to ongoing efforts in intermodality by participating in several projects dealing with intermodal concepts and developments.

Main author: Intermodal Transport, Integration

Peer review: Financing Tools, Pricing and Taxation

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Wolfgang Helmreich, Industriebetriebe-Betriebsgesellschaft mbH (IABG); Germany
 Mr Helmreich is a civil engineer from the Technical University of Munich. He has more than 15 years experience with transport planning and infrastructure design in the rail, road and air sector, and sound knowledge of vehicle technologies. His expertise also includes project management, web publishing and dissemination skills. He joined IABG in 1999 as a senior transport consultant after working as project manager at several German engineering companies. He is principal editor of all Thematic Research Summaries.

Main author: Air Transport, User Aspects, Safety and Security

Peer review: Regional Transport, Rail Transport, Waterborne Transport, Environmental Aspects, Land Use Planning

Cristina Ivan, Group of Independent Experts Ltd (GIE); Romania

Ms Ivan has a law degree and has graduated a Master course in project management. Ever since 1998 she has participated in various projects financed by international donors in Romania. The main areas of her expertise cover: project management, legal approximation of the EU acquis & drafting of environmental legislation, as well as the carrying out of awareness raising and dissemination activities, including those for the transport sector.

Main author: EU Accession Issues

Peer review: Economic Aspects, User Aspects, Transport Management

Dr Ann Jopson, Institute for Transport Studies, University of Leeds (ITS); UK

Dr Jopson is a Research Fellow whose main interests and expertise lie in the areas of travel behaviour psychology, transport marketing and urban transport planning and policy, with particular emphasis on travel demand management through attitudinal and behavioural measures. Her PhD thesis was based on the role of psychology in reducing car use.

Main author: Environmental Aspects

Peer review: Rural Transport

Dimitris Koryzis, Systema; Greece

Mr Koryzis is a production & management engineer from the Technical University of Crete and holds an MSc in Decision Sciences from Athens University of Economics & Business. He has more than 8 years experience as technical and managerial consultant for 30 European programmes in the transport sector (road, maritime and intermodal) as well as in research and innovation technology EC projects.

Co-author: Pricing, Taxation and Financing Tools

Peer review: Integration

Ulrich Leiss, Industriebetriebe-Betriebsgesellschaft mbH (IABG); Germany

Mr Leiss is an aerospace engineer from the Technical University of Munich. His professional career includes 24 years experience with research, technical analyses, monitoring and managing national and European projects and programmes. These activities cover the areas aerospace, transport, energy and new technologies.

Main author: Other Modes, Vehicle Technology

Bryan Matthews, Institute for Transport Studies, University of Leeds (ITS); UK

Mr Matthews has 9 years experience of transport research and project management in both consultancy and university settings. His research expertise is in transport policy analysis and transport economics. He has worked on a number of EU, UK DfT and Research Council projects. He also contributes to teaching activities, lecturing on Air Transport Systems and supervising student projects.

Main author: Rail Transport

Peer review: Air Transport

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Prof Anthony D May, Institute for Transport Studies, University of Leeds (ITS); UK
 Professor May has over 35 years' experience in transport planning and traffic engineering. He has been a professor at Leeds since 1977, and has served as Head of the Department of Civil Engineering, Dean of the Faculty of Engineering, Pro-Vice Chancellor for Research and Director of the Institute for Transport Studies. He also has practical experience with the MVA consultancy and the GLC in London. His research specialities include: land use planning, traffic management, road pricing, sustainable urban transport, integrated transport and environmental impacts of transport.

Supervision of entire process of thematic reviews

Batool Menaz, Institute for Transport Studies, University of Leeds (ITS); UK
 Ms Menaz is a transport economist from the University of Leeds. She has been involved in a number of various projects including research into transport pricing reform issues in air, road and rail for the IMPRINT-Europe thematic network project, and research for the UK Rail Research Centre looking at the alternative visions for the future of the British rail system.

Main author: Regulation/Deregulation

Co-author: Passenger Transport, Equity and Accessibility, Land Use Planning

Peer review: Road Transport

Christina Paschalidou, Systema; Greece

Ms Paschalidou is a transportation engineer from Aristotle University (Thessaloniki), with a MSc in Urban and Regional Transport from Laboratory of Transport Economics in Lyon. Her field of interest is transport planning and engineering, EU and national transport policies, sustainability issues and research. She joined Systema in 2005, while her previous experience includes an internship in ISIS, traffic studies elaborated individually and research activities in the Aristotle University.

Main author: Transport Management

Peer review: Information and Awareness

Ignacio Rada Cotera, Neptune – IkerConsulting; Spain

Mr Rada Cotera is a lawyer from Deusto University in Bilbao, holding a diploma and certificate of European studies from Deusto and Saarland Universities, respectively. He has been working on EU projects since 2000. His main expertise is European commercial and regional policy, maritime transport and port affairs, legal aspects of international economic relations, urban planning, regional benchmarking and development.

Main author: Regional Transport

Marco Valerio Salucci, Università di Roma "La Sapienza", DITS; Italy

Mr Salucci holds a degree in mechanical engineering from the University of Rome "La Sapienza". His past research experience has focused on computer modelling of the operations of freight terminals and automatic passenger transport systems, the latter being carried out within EC funded research projects. His current research for a doctorate is in the area of transshipment and information and communication technologies for intermodal freight transport.

Co-author: Freight Transport, Urban Transport, Rural Transport, Efficiency, Decision-support Tools

Peer review: Intermodal Transport

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Dr Karsten Seidel, Neptune – European Networks and Cooperation; Belgium/Germany
Dr Seidel has graduated as economist and holds a PhD from the University of Bremen. He has been working on EU projects since 1988. His main expertise is in European industrial and regional policy, telecommunication research projects, maritime transport and port affairs, evaluation of technical aid, urban planning, regional benchmarking development.

Co-author: Regional Transport

Dr Paolo Delle Site, Università di Roma "La Sapienza", DITS; Italy
Dr Delle Site holds an PhD, and is a senior research fellow at DITS, Transport Area, University of Rome "La Sapienza". He combines professional experience with research activities, the latter mainly being carried out within EC funded research projects. Related activities comprise urban transport planning, urban public transport design, transport project assessment, and policy analysis. His teaching activities include courses in transport planning. Furthermore, he is author of papers in Transportation Research Part A – Policy and Practice and in the European Journal of Transport and Infrastructure Research.

Co-author: Freight Transport, Urban Transport, Rural Transport, Economic Aspects, Infrastructure Provision, Pricing, Taxation and Financing Tools

Peer review: EU Accession Issues, Intelligent Transport Systems, Regulation/Deregulation

Damian Stantchev, Institute for Transport Studies, University of Leeds (ITS); UK
Mr Stantchev holds a degree in Economics and Trade from Varna University of Economics in Bulgaria and an MA in Political Science from the Central European University in Hungary. His early research experience was in the area of small business development in transitional economies of Central and Eastern Europe. Damian has also contributed to an extensive report on the role of the logistics and transportation sector in society for the Logistics & Transportation Corporate Citizenship Initiative of the World Economic Forum. His research for a doctorate examines the role of logistics in enhancing the competitiveness of the regional economy and encompasses all aspects of original research and data collection including the design, conduct and analyses of large scale surveys as well as the collection of commercial data and development of case studies.

Main author: Passenger Transport, Land Use Planning, Equity and Accessibility

Peer review: Freight Transport

Andrew Winder, ISIS; France

Mr Winder is a transport planner with a BSc in transport management (Aston University, England) and over 15 years experience in consultancies and public transport authorities covering transport planning and policy, particularly at UK, French and Europe-wide levels. Since 1998 he has been a senior engineer at ISIS, responsible for a wide range of European projects focusing primarily on Trans-European Networks, ITS for road traffic management, urban and regional public transport and EU enlargement aspects.

Main author: Road Transport

Peer review: Passenger Transport, Urban Transport, Other Modes, Equity and Accessibility, Infrastructure Provision

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Ard Wolthuis, Università di Roma "La Sapienza", DITS; Italy

Ard Wolthuis graduated in Science & Innovation Management, in the field of Transport and Mobility, from the University of Utrecht. He has been involved in transport projects and analysed socio-economic, environmental, political and legal aspects, such as the Phileas project, the Fokker bankruptcy, and innovation policy of companies in the Netherlands. Has participated in a European project on innovation in urban public transport systems. Since spring 2005 has joined DITS as a research fellow. His main areas of activities are policy analysis and dissemination of research results.

Co-author: Efficiency, Decision-support Tools

Dr Zhaomin Zhang, ANAST – University of Liege, Neptune; Belgium

Dr Zhang has got the university degrees of Civil Engineering, Mechanical and Marine Engineering; Master of Transportation Sciences and Doctor of Philosophy. He is a senior engineer and led the important projects related to the "Establishment of a mathematical traffic model on the Belgian waterway network" (Belgian national research program "Transport and mobility"), the project called "On computerisation and management in real-time of operations relating to the exploitation of fluvial traffic to organise the waterway transport", Belgian Regional Ministry of Public Works) and the Project related to the development of a transport cost model in the inland navigation sector. He has also been involved in numerous simulation and operation research activities.

Peer review: Decision-support Tools

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