CATRIN

Cost Allocation of Transport Infrastructure Cost

**Funding:** European (6th RTD Framework Programme)

**Duration:** Sep 2005 - Mar 2009

**Status:** Complete with results

**Total project cost:** €2,197,787

**EU contribution:** €1,446,587

**Call for proposal:** FP6-2005-TREN-4

**CORDIS RCN:** 85675

**Background & policy context:**

Over the past fifty years, Sweden has invested large sums of money and effort in research into vehicle and road safety. According to a report from Swedish Governmental Agency for Innovation Systems, Vinnova, this work has saved thousands of lives and money amounting to several billions of Swedish crowns (SEK). The results show that, thanks to this research, Sweden saves 481 lives annually, which represents a value of 8.4 billion SEK. Road accidents are a serious social problem. In Sweden alone, road accidents cost society about 30 billion SEK per year (2005).

At the same time, Sweden is today one of the leading countries in the world as regards vehicle and road safety. Sweden has reduced the number of fatalities in traffic from 1,307 in 1970 to 440 in 2005, during which period the volume of traffic has more than doubled.

The Vinnova report has, in case studies, analysed the effects of five important research areas:

- speed reduction measures in towns and cities;
- better safety for children in cars;
- better protection in new cars against whiplash injuries;
- side collision protection;
- more effective police surveillance.

Overall, public funding agencies have invested 440 million SEK over the period 1974-2004. This should be compared with the net benefit of about 20 billion SEK which the above research areas are estimated to have contributed to. CATRIN is a Research project to support the European Transport Policy, specifically to assist in the Implementation of Transport pricing.

**Objectives:**

CATRIN will increase the probability that new progressive pricing principles can be implemented which facilitate a move towards sustainable transport. The project is intended to clarify the current position on allocation of infrastructure cost in all modes of transport. Pricing principles will be dealt with under the knowledge that they vary with the organisational structure of a sector. The project establishes the micro-aspects of cost recovery above marginal costs, including the results of application of a club approach and the implications of who bears the costs for cost recovery under alternative allocation rules, using game theoretic analytical tools.

CATRIN is both an intermodal and an interdisciplinary project. It tries to clarify the current position on the allocation of infrastructure costs in all modes of transport. CATRIN will blend the economic principles of pricing with engineering knowledge. Based on engineering studies, the possibility of defining more differentiated pricing rules for vehicle/locomotive categories will be analysed.

CATRIN will establish the micro-aspects of cost recovery above marginal costs, including the results of applying a club approach and the implication of who bears the costs for cost recovery under alternative allocation rules, using game theoretic analytical tools. In a modal focus, with real world cases, CATRIN
will develop proxies to marginal costs and test some of the allocation approaches. The possibilities for a European road damage test will be outlined which should give new evidences on the fourth-power-rule. Furthermore, CATRIN will develop financing alternatives for icebreaking activities and will explore cost allocation issues in the aviation sector.

**Methodology:**

- CATRIN develops an understanding of the policy needs of the new Member States and can give tailored recommendations.
- In a modal focus, with real world cases, CATRIN will develop proxies to marginal costs, and test some of the allocation approaches.
- Based on engineering studies CATRIN will analyse the possibility to defining more differentiated pricing rules for vehicle/locomotive categories.
- Partners with strong engineering knowledge are included and CATRIN will blend the economic principles of pricing with engineering knowledge.
- CATRIN will outline the possibilities for a European Road Damage test that will give new evidences on the fourth-power-rule.
- CATRIN will develop financing alternatives for icebreaking and will explore cost allocation in the aviation sector.
- Finally, CATRIN will strongly address the implementation potential and constraints experienced by infrastructure managers.

**Parent Programmes:**

- **FP6-SUSTDEV-2 - Sustainable Surface Transport**

**Institute type:** Public institution  
**Institute name:** European Commission  
**Funding type:** Public (EU)

**Lead Organisation:**

<table>
<thead>
<tr>
<th>Statens Geotekniska Institut</th>
</tr>
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</table>
| **Address:**  | Olaus Magnus Vag 35  
|               | 58193 Linkoping  
|               | Sweden  |
| **Organisation Website:**  | [http://www.vti.se](http://www.vti.se)  
| **EU Contribution:**  | €0 |

**Partner Organisations:**

<table>
<thead>
<tr>
<th>Istituto Di Studi Per L'integrazione Dei Sistemi</th>
</tr>
</thead>
</table>
| **Address:**  | VIA FLAMINIA, 21  
|               | ROME  
|               | Italy  |
| **Organisation Website:**  | [http://www.isis-it-com](http://www.isis-it-com)  
| **EU Contribution:**  | €0 |

<table>
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<tr>
<th>Uniwersytet Gdanski</th>
</tr>
</thead>
</table>
| **Address:**  | UL. BAZYNSKIEGO 8  
|               | 80309 GDANSK  
|               | Poland  |
| **Organisation Website:**  | }
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<tr>
<th>Organisation Name</th>
<th>Address</th>
<th>Website</th>
<th>EU Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Of Leeds</td>
<td>University Rd, Leeds, LS2 9JT, United Kingdom</td>
<td><a href="http://www.leeds.ac.uk">http://www.leeds.ac.uk</a></td>
<td>€0</td>
</tr>
<tr>
<td>Deutsches Institut Für Wirtschaftsforschung E.v. (German Institute For Economic Research)</td>
<td>Mohrenstraße 58, Berlin, Germany</td>
<td></td>
<td>€0</td>
</tr>
<tr>
<td>Ecoplan - Müller, Neuenschwander, Sommer, Suter, Walter; Economic Research And Policy Consultancy</td>
<td>Thunstrasse 22, 3005 Berne, Switzerland</td>
<td><a href="http://www.ecoplan.ch">http://www.ecoplan.ch</a></td>
<td>€0</td>
</tr>
<tr>
<td>Ecole Nationale Des Ponts Et Chaussées</td>
<td>6 &amp; 8 Avenue Blaise Pascal- Cité Descartes, 77455 Champs sur Marne, France</td>
<td><a href="http://www.enpc.fr">http://www.enpc.fr</a></td>
<td>€0</td>
</tr>
<tr>
<td>Manchester Metropolitan University</td>
<td>All Saints Building, Oxford Road, Manchester, M15 6BH, United Kingdom</td>
<td><a href="http://www.mmu.ac.uk">http://www.mmu.ac.uk</a></td>
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Key Results:

A number of findings have been made within the research areas of this project.

The main findings relating to the provision of infrastructure service are:

- when only infrastructure costs are considered, it is clear that most infrastructure services should be charged at a very low rate and will face a problem of cost recovery;
- adding congestion and scarcity pricing will enhance the efficient use of the infrastructure, and, in addition, it will reduce the need for expanding the capacity of infrastructure - in all modes of transport;
- adding taxation of negative externalities will generate additional revenues solving the cost recovery issue for most of the modes leaving railways as the mode that for efficiency reasons should be financed by society in other ways.

As for the organisation of infrastructure services, this project has shown that the average infrastructure cost is far above the short-run marginal infrastructure cost in road and rail transport. A method to generalise the results of the project on short-run marginal infrastructure cost which can be applied Europe wide has been proposed. Furthermore, it has been pointed out that there is scope for more time-dependent charges in both road and rail infrastructure charges in Europe. Such charges will both generate revenues and move towards cost recovery in both sectors and reduce the excess demand for infrastructure services. The Maritime sector outside ports exhibits the classical attributes of natural monopolies. It has been shown that Icebreaking services exhibits substantial economies of scale making it possible for cooperation between Member States around the Baltic Sea to reduce the need for icebreakers.

As for rail and road marginal cost estimates, this research project has clearly demonstrated that marginal costs differ considerably by traffic density and infrastructure quality in both modes. The CATRIN method of rail and road infrastructure marginal cost generalisation has been proposed. This method is based on the observation that usage elasticity is reasonably stable while the average cost varies between infrastructure type and Member States. This method uses the definition: Marginal cost = Average cost x Usage elasticity. A Member State should estimate the average infrastructure cost for renewal maintenance (and operation) on its infrastructure network or a relevant part and use the usage elasticities suggested by this project. However, while the general knowledge suggests t

Technical Implications

This project has experienced many difficulties with collection of data. It is extremely difficult, especially in the road sector, to find data of high quality on a level that makes it possible to make good analyses. During the project it has not been possible to examine why the incentives in this sector are such that
dataset for long-term monitoring and auditing is non-existing in most Member States. For more reliable results road authorities have to be instructed to collect data for research as well as for auditing and benchmarking. More research is needed to address these issues.

Documents:
- Conclusions and Recommendations (Final report)

**STRIA Roadmaps:** Other specified
**Transport mode:** Multimodal transport
**Transport sectors:** Passenger transport, Freight transport
**Transport policies:** Societal/Economic issues
**Geo-spatial type:** Other