

Pricing Urban Transport

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Welcome to the fourth issue of the European Transport Pricing Initiative Newsletter

CUPID Update

The CUPID project is working closely with partners in PROGRESS to undertake an evaluation of the pricing proposals in each city. Although not all the cities will have implemented full schemes by the end of the project, the evaluation process will provide valuable insight into the background to the various pricing schemes, the barriers which were encountered in their development and the factors required for success.

Over the last year CUPID has held a number of workshops for the PROGRESS cities. These have addressed topics such as the legal issues surrounding pricing, handling the media, the use of stated preference techniques and the implementation of pricing measures. The latter included a presentation by Gopinath Menon, who was responsible for the Singapore electronic road pricing initiative (see page 6). The papers for these workshops are available on www.transport-pricing.net

A Synthesis Report which provides background information on the PROGRESS cities, and an update on pricing developments in many European Member States, as well as worldwide experience, is also now available on the internet. This will be updated as CUPID continues, in order to provide an up to date resume of developments in urban transport pricing.

GPS On Trial in Copenhagen



In-car system being trialled in Copenhagen

What are the effects of road pricing? Politicians in many cities all over Europe are asking this question. Models have been developed and used around the clock to try to find answers, but after some years, in which high profile models have been tested and weaknesses revealed, politicians are seeking other ways to find the answers.

Copenhagen and Gothenburg are looking at alternatives. Real users are testing road pricing with real money. How does this work? Since taxing just a few volunteers is not an option, a different approach has been necessary. Instead of taxing the driven kilometres, the volunteers

are paid for each kilometre they save. The resulting economical effect for the test driver is the same per kilometre. To measure the number of saved kilometres, most drivers are running

firstly through a control phase, which will measure their normal driving behaviour, and then through a tax phase where the costs are calculated.

A positioning unit, installed in the car, is used to monitor the test drivers. The unit detects the position of the car by using GPS satellite technologies. All the positions are used to calculate the cost of driving in the specific areas.

The result is a unique database of the driving behaviour of 500 drivers in Copenhagen alone. A total of 150 man-years of driving behaviour has been stored, second by second. This large amount of data allows a very detailed analysis of

the driving behaviour of each driver, and of the test group as a whole.

Three road pricing tax structures are being tested in Copenhagen: high cost km charges, low cost km charges and finally a multi-cordon charging system. The multi-cordon charge system does not really require GPS to be tested, but as GPS allows easy simulation of a cordon system, Copenhagen has chosen to use the same technology for all three tax structures.



Routes driven by one volunteer within central Copenhagen during one week



The GPS technology has proven to be sufficiently reliable for trial purposes, but it is also very evident that GPS technology cannot stand alone in a full scale charging scheme. Positioning requires a quality signal but transmission can easily be disturbed, e.g. by tall buildings, tunnels, the roof of the car or deliberately by the driver. Still, for testing purposes or as a complement to other technologies GPS seems to have a bright future.

For more information on CUPID, PROGRESS and urban transport pricing issues visit www.transport-pricing.net

Snapshot of Europe: Urban Transport Pricing

Belgium

Road user charging for the region of Brussels was recently discussed at the national level. The government however abandoned the idea as being socially unacceptable, since there are no real alternatives for travelling at a reasonable price (the public transport infrastructure is already saturated).

Finland

Proposals for urban pricing for the whole Metropolitan Area of Helsinki and for

Helsinki City Centre only have been made, and alternatives studied at regular intervals since the early 1990s. However, the proposals did not gain favour with many of the political parties, the media or motorist organisations and were thus withdrawn. Discussion of the issue is now limited in the main to academics.

France

Public opposition to road tolls in Lyon and Toulouse was so strong that these proposed schemes were

abandoned. However, successful road tolling schemes in Paris, Marseille and tunnels in Lyon are in operation, although these are not congestion charging schemes. An outer ring road being built in Paris is to be tolled and Lyon, Grenoble and St Etienne are currently considering a number of transport issues together, including road pricing.

Germany

At the moment it is not legally possible to

introduce urban road pricing in Germany. Its introduction is being hindered by the responsibility of various institutions for different categories of roads.

Ireland

A recent study into road pricing concluded that congestion charge in central Dublin could reduce congestion. However, the success of any scheme would be highly dependent on a parallel programme of public transport enhancement.

Genoa Trial Gets Ready for the Off

Genoa, one of the main ports in the Mediterranean Sea, occupies a 30 km narrow stretch along the coast and nestles between the hills and the sea. The main routes crossing from east to west have therefore always intersected the city centre; the alternative peripheral low-capacity streets are perceived by users to take longer and to be more costly. This has led to the inappropriate use of resources i.e. the road network, greater pollution levels and a worsened quality of life.

An origin–destination survey undertaken in 2001 showed a modal split with a high preference for private

modes: for instance, 14,000 cars and about 8,000 motorbikes enter the centre in the morning peak hour (07.30 – 08.30).

Road pricing is one of the innovative measures that the Municipality of Genoa is considering as a means of influencing the modal split.

Within the European PRoGRESS project, Genoa will evaluate the reliability of the Optical Character Recognition (OCR) technology in a demonstration involving selected volunteers. The target area spans about 1km² covering the ancient historical centre, the heart of commercial activities and



The pricing area in Genoa

January 2003.

the main pedestrian streets. Seven gates on the routes accessing the city centre are being installed.

A Stated Preference Survey has been conducted to gain an understanding of the reactions of the citizens, and a series of meetings have been held with the stakeholders to disseminate the results and to collect their impressions and views of road user charging.

Difficulties at the political level and the resistance of the main stakeholders have reduced the scale of the full-blown demonstration project to a volunteer based trial. So far, only the gates have been installed; the demo phase will get underway in

The design phase has considered:

- the location of the gates;
- the volunteers based demo scheme;
- the full scale pricing schemes;
- the full scale toll collection organizational procedures;
- the full scale scheme software for toll collection.

The results from the demonstration, and their evaluation, will be used to help to explain the role of road pricing within current sustainable mobility policies.



Aerial view of the port and downtown

PRoGR€SS

Activities in the Partner Cities

Bristol

Delays to the implementation of some complementary measures have meant that Bristol will not be implementing a full road user charging scheme during PRoGR€SS. A technology trial of VPS charging, and ANPR enforcement methodologies, using volunteer commercial/fleet vehicles is being developed with the national government. The demonstrator will inform the technology choice for the full scheme, and investigate the interoperability of a city cordon with the proposed national charging scheme for lorries.

Development of the full road user charging scheme is continuing. The detailed design modelling study has been almost completed, assessing the impacts of different charging scheme options in association with a package of transport measures. Development of policy and guidance is continuing through the Charging Development Partnership and Bristol is currently developing the business case for charging.

Implementation of complementary package measures has continued. In April, a new Park & Ride site was opened to the

northwest of the city, and the rollout of showcase bus route measures has progressed.



Portway Park and Ride, opened April 2002 (photograph courtesy of BCC)

Edinburgh

During June and July this year Edinburgh undertook a major consultation exercise. This was targeted at residents of the city, as well as those from the city's catchment area who might be affected because they work in Edinburgh or visit the city at least occasionally. Almost a quarter of a million leaflets, incorporating a questionnaire, were distributed throughout South East Scotland.

The consultation set out three options for consideration:

- A** A city centre charging cordon, with an investment package to improve public transport within the city;
- B** A city centre charge and a charging cordon at the edge of the built-up area. Revenues would be used for transport improvements both within the city and linking the city with the wider region;
- C** A 'status quo' option involving no charging and limited investment in transport improvements.

The consultation process and analysis are being overseen by the University of Westminster, partners in the PRoGR€SS project. The results will form a key part of a report to the Council this autumn recommending a way forward.



Details of the two charging options

Gothenburg

In June, the first part of the PROGR€SS field trial involving evaluation of the on-board units and user attitudes towards road user charges, was completed in Gothenburg. 85 test drivers participated in the first trial round. Feedback from the group showed that:

- Approximately 30% of the drivers who were positive about participating during the recruitment call finally installed equipment.
- Equipment in 13% of the test cars transmitted "perfect" data.
- GPS positioning performed well.
- The GSM communication had problems with repeated lack of connection at call-up.
- Software bugs in early versions resulted in power failure caused by short circuit in the central unit and unit fallout.
- The project has attracted considerable interest from the press,

media, politicians, experts, students and public.

The technical problems encountered during the first phase of the field trial have been solved through hardware and software development. All units have been upgraded with the latest software over the summer and installed for the second test group (early September).



User interface

Helsinki

The PROGRASS activities in Helsinki have two main goals: to study the effects of urban pricing measures through modelling and to study the acceptability and preliminary reactions of users via a stated preference survey. The modelling has now been completed and the project is proceeding to the acceptability surveys.

At the same time, an increase in activities regarding pricing issues are now being seen at the national level. At the beginning of 2002 the Ministry of Transport and Communications published a report on "New models for the funding of transport infrastructure services". The report proposes changing the structure of the existing funding structure, firstly towards tax-like charges and ultimately to pricing based on geographical positioning.

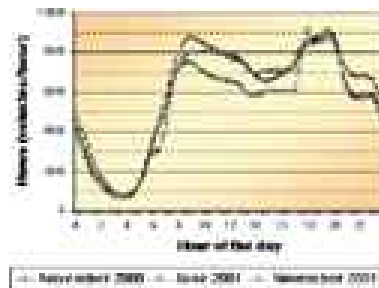
Just recently the Ministries of Transport and Communications, and Finance established an informal working group to study the taxes and charges related to different transport modes taking into account the white paper proposals. In the light of these latest developments, the timing of the PROGRASS project seems to be optimal.



Traffic entering Helsinki Central Business Centre via the South Western Motorway (morning peak, August 2002)

Rome

Access control with a flat Road Pricing (RP) scheme, operated through an automatic control system in the east of Tiber area (4.6 km²), has been fully operational, with enforcement against violations since 1st October 2001 in Rome.



Flow comparison after the system activation

The system, which has proved to be high reliable, is based on 23 entrance gates and is switched on from 06.30 to 18.00 on working days and in the afternoon only on Saturdays. Recent surveys have shown that 75% of the residents within the LTZ

and 53% of retailers accept the new system. Indeed, 65% of residents and even 67% of the retailers agree with the road pricing policies planned for the future.

A 20% reduction in traffic flows and a 6% increase in public transport usage were recorded. There was also an increase in transits after the system closes at 18.00, suggesting that access control could be extended in the evenings, possibly up to 22.00, and on certain main holidays.

It seems clear however that the fares to be applied in a pure road pricing scenario (i.e. with everyone able to access the LTZ), would be too high to be socially or politically accepted. Regulated access for powered two-wheelers (at least two-stroke vehicles without exhaust emissions control) and freight vehicles is now needed if a reduction in air pollution and traffic flows is to be achieved.

Trondheim

The City Council approved the final upgrade of the existing tolling system late in 2001. A new City Centre toll zone will be introduced from early 2003, with the aim of:

- increasing the income of the toll system (from 140 to 170 MNOK)
- securing the funding of the investments in the Trondheim Package
- improving equity

As a result, Trondheim's urban pricing demonstration scheme in PROGRASS has been adjusted. It now consists of the following tests:

1. Evaluation of the long term effects of tolling (a follow-up study after 10 years of urban tolling).
2. Evaluation of the proposed City Centre tolling zone.
3. Introduction of a new through traffic road user charge for the City Centre.

All the tests in Trondheim are based on real life systems.

The third test has not so far obtained political approval. The benefits of the scheme correspond closely to the political goals

in the local transport plan (i.e. to reduce traffic, improve the environment, improve accessibility and stimulate public transport). Considerable work is currently taking place to get the necessary political support.

Automatic toll plaza in Trondheim



Congestion Charging To Go Ahead in the UK

The first city to implement a congestion charge in the UK is Durham in September 2002. A $\pounds 3$ charge will be levied on all drivers entering part of the historic core of the city. Whilst the scheme is very simple, it is the first application of the legal powers which will form the basis of future schemes.

Following public consultation on the proposed congestion charging scheme for central London at the end of 2001, the Mayor of London decided earlier this year to go ahead with the scheme. After various legal and other challenges, the date for implementation has been set for 17 February 2003.

The congestion charging team at Transport for London Street Management has been developing the scheme, along with a range of complementary measures, since 2000. Procurement of the necessary technology and services is now in progress.

The scheme operates using

a virtual area based licence and covers the heart of central London (21 square kilometres). A variety of exemptions and discounts which have been subject to public consultation are also in place. The scheme will be enforced using Automatic Number Plate Recognition (ANPR) technology.

Implementation and Operation: Drawing on the Singapore experience

The CUPID Workshop held in Rome in May 2002 considered implementation and operation issues. Of particular interest was a presentation by Gopinath Menon who has been involved with the operation of the Singapore Road Pricing system since its inception in 1975. The experience from Singapore can be used to provide a generic list of implementation and operation issues that should be considered by all cities considering the introduction of urban road pricing.

In 1998, the original manual road pricing system in Singapore was replaced by an electronic road pricing

system (ERP). The ERP charged all vehicles, except emergency vehicles, entering the central area of Singapore on weekdays (all day) and congested stretches of expressways and major roads (during the morning peak). The capital cost was S\$197 million ($\pounds 110$ million) and the operating and maintenance cost is S\$24 million ($\pounds 13.4$ million) per year. The revenues from the system are not used to support expenditure on transportation infrastructure and operations.

The system's main physical components are: In-vehicle Units (IU), note-book sized devices fixed permanently

to the windscreen of four-wheeled vehicles and to handlebars of motorcycles and scooters; CashCards, prepayment cards which are inserted into the IUs; overhead gantries (located at entry points); and a Control Centre. Charges vary from 50 cents ($\pounds 0.28$) to S\$3 ($\pounds 1.67$) for cars and can be different for each half-hour and at each gantry. The charges for other vehicles vary in direct proportion to their pcu values (0.5 for motorcycles, 1.5 for heavy goods vehicles and 2 for large buses). The charges are updated every 3 months in response to the experienced level of congestion.

The issues highlighted by the Singapore experience which prospective candidates should consider in developing their own road user charging schemes include:

- What type of vehicles (if any) should be given exemptions?
- What are the expected capital and maintenance costs of the system?
- How should revenues from the system be used?
- If IUs are used, what steps should be taken so that they do not obstruct the vision of drivers or unbalance motorcyclists?
- How long a period should be allocated to installing IUs? (it took 10 months in Singapore to install them in 700,000 vehicles).
- If charges differ by location and time period, how should this information be presented to drivers?
- If charges are updated regularly, how should new charges be set and how should drivers be informed of these changes?
- What steps can be taken to avoid local congestion at gantry points immediately before and after the charging period?
- Should drivers be able to pay by monthly bill instead of by prepayment?



Singapore's CashCard and In-Vehicle Unit



Electronic road pricing in operation in Singapore

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