



Competitive and Sustainable Growth Programme

PRoGR€SS Project 2000-CM.10390

PRICING ROAD USE FOR GREATER RESPONSIBILITY, EFFICIENCY AND SUSTAINABILITY IN CITIES

Bristol • Copenhagen • Edinburgh • Genoa • Gothenburg • Helsinki • Rome • Trondheim



Deliverable D6.1

**WP5 – Evaluation
Initial Results**

**Version 1.0
June 2003**

FOREWORD

The extensive problems caused by road traffic are acknowledged in many urban areas. The introduction of road user charging (RUC) has been proposed by many professions as an effective means for controlling the road transport demand. The introduction of a new taxation system like RUC is however very controversial and unpopular. This has led to a situation where the advice from the professionals is overridden by the politicians.

Through the PRoGRESS project, the European Commission has invited eight European cities to take part in a large experiment on urban pricing. The project started in June 2000 and will terminate in 2004. Most of the cities were planning to run full-scale demonstrations at the start of the project, and they all had political support for this. But the premise has changed. For several cities the introduction of RUC has become a more problematic political issue than anticipated. This has led to a delay and a redesign of several demonstrations. Only those cities carrying out technical tests are in line with their original time schedule.

This document was initially planned to present the first preliminary results from the demonstrations. However, given the actual situation for many of the demonstrations, it was agreed among the partners that the D6.1 will not include many results. The report will mainly be a documentation of available before data, and references to how data collection will be carried out through the demonstrations. This is a decision taken in understanding with CUPID, the thematic network for PRoGRESS.

This report is an internal report, and the reader will find that the presentation forms vary between the different cities. At this stage of the project, we have not put effort into making the layout uniform, but we will use this document as a tool to find the best presentation form for the final deliverable D6.2.

Trondheim, June 2003

Eirik Skjetne
Workpackage Leader

EXECUTIVE SUMMARY

Project Goals

PRoGRESS is a project founded on local road user charging initiatives in eight European cities. DGTREN of the European Commission supports the project as a demonstration project under the Growth program. The eight cities are:

- Bristol, UK
- Copenhagen, Denmark
- Edinburgh, UK
- Genoa, Italy
- Gothenburg, Sweden
- Helsinki, Finland
- Rome, Italy
- Trondheim, Norway

The main goal of the PRoGRESS project is:

“to demonstrate and evaluate the effectiveness and acceptance of integrated urban transport pricing schemes to achieve transport goals and raise revenue.”

The PRoGRESS project will give guidelines for use of road pricing (RP), or more widely urban pricing, as a transport policy tool. Key questions that need to be answered are:

- What is the social and political acceptance of urban pricing schemes?
- How effective are these schemes in meeting social and transport goals?

These questions can only be fully answered through comprehensive, real-life demonstrations of transport pricing schemes.

The results from the local evaluation of the demonstrators will be:

- 1) Background information on the political, social, and economic effort required for successful implementation of road pricing. Example of valuable information will be that on social and political acceptance, legal and organisation support, and cost and financing issues.
- 2) Knowledge about impacts and effectiveness of urban pricing schemes. Resulting information will be:
 - The technical and operational aspects of the schemes and technologies
 - Social equity and acceptance
 - Transport efficiency
 - Raising revenue
 - Improving the quality of the urban environment
 - Maintaining and improving local economic and employment prospects

- Long-term effects of road user charging with respect to impacts on land use development, acceptance and social equity
- 3) Evaluation of technology used for urban pricing. This will give an important contribution to the standardisation and interoperability of electronic pricing schemes.

The Commission has also founded a parallel project to PRoGRESS called CUPID, a Thematic Network. The Network comprises experts from six European organisations:

- Transport & Travel Research Ltd (UK)
- ISIS (Italy)
- ITS Leeds (UK)
- SINTEF (Norway)
- TIS (Portugal)
- Technical University of Dresden (Germany)

CUPID will provide PRoGRESS with support during the project, and will also be responsible for the cross-site evaluation of the demonstrators at a European level.

This document contains a summary of the status of the demonstrations in the cities. The presentation is based on input from the cities and an evaluation framework provided by CUPID¹. The Evaluation Framework aims to provide a coherent set of indicators and methods for evaluation and assessment of the PRoGRESS demonstrators.

Contents of this Report

Only a few of the cities are, at the moment, in a position where the trials/demonstrators are finished. It is therefore not possible to present a document with initial results at the moment. Several of the cities are now implementing their scheme. Complete results from all the surveys will not be ready until late 2003.

After discussions in the project we still decided to go forward with this deliverable D6.1, but the contents are not the intended initial results. Instead, this report is documenting the available results and a detailed specification of how data will be collected. The cities have gone through the indicator list from CUPID, and for each indicator specified the link to the local data and survey inventory (DSI). This exercise has proved valuable for CUPID, who have got an early start on the cross-European summary.

The input varies in form and contents because of the delay that many cities have experienced with their demonstration due to lack of political support. In preparation of this report, the input from the cities is processed and edited by the WP leader. It has, however, been impossible to give this document a uniform form. To make the report more readable, much of the local topics concerning the evaluation process are put in annexes. The same applies also to detailed information about the local data collection and surveys.

¹ CUPID. Deliverable 4: Evaluation Framework.

Urban Pricing Schemes

The PRoGRESS project brings together eight cities, each aiming at the ultimate goal of integrated urban transport pricing. These cities are at various stages of development with regards to reaching this goal. By working together, knowledge and lessons learned can be shared among the partners.

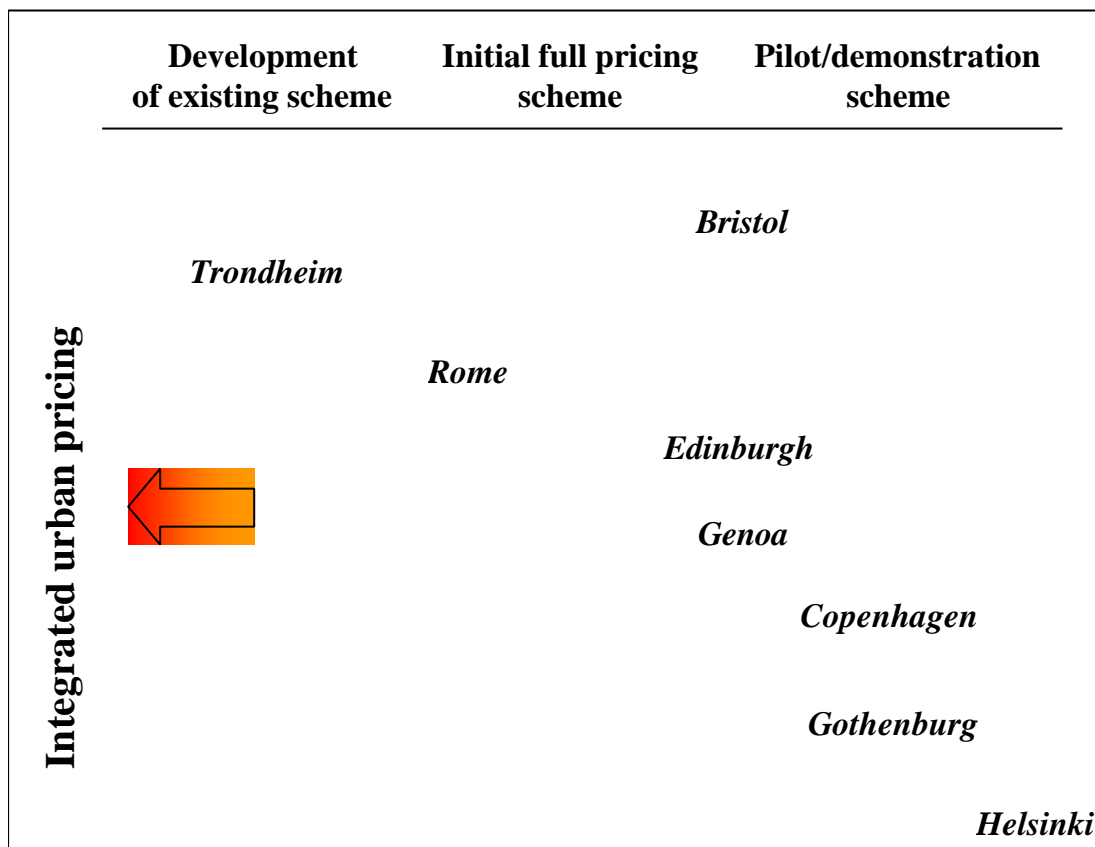


Figure 1 Status of Urban Road Pricing in the PRoGRESS Cities

Figure 1 shows how far the cities have reached in developing an urban pricing system. Altogether the cities cover the process from the modelling of RUC systems in Helsinki, to Trondheim who is developing an existing system.

Trondheim introduced RUC as a toll ring in 1991 using electronic tags and unmanned toll plazas. This scheme was further developed in 1998 to a zonal system. The demonstration in Trondheim is divided in three parts:

1. Long term effects and experience of RUC.
2. Implementation of a new city cordon enclosing the city centre.
3. A user or feasibility study of future use of the charging infrastructure for more sophisticated RUC schemes which will be addressing demand management, integrating RUC with the public transport charging and parking payment systems.

In Rome, traffic restrictions for the central historical area were introduced in 1989 when non-authorized vehicle entrances were prohibited during most business hours. From

1998, some specific authorised non-residents are required to pay yearly in order to access the restricted area. From October 2001, during the PRoGRESS demonstration, an electronic full-scale Access Control System along with a flat-fare Road Pricing scheme (ACS+RP) called IRIDE is operational, based on 23 electronic entrance gates and a control centre located in STA. Gate technology is based on TV Camera and IR Illuminators, coupled with DSRC technology used for the TELEPASS system with microwave transponder and On-board Unit.

The introduction of different (i.e. per-trip or time-based) road pricing schemes in the area during the current operational time of the ACS+RP (from 6:30am to 6:00pm) would not lead, according to simulations, to substantial changes in terms of overall modal split, because only a relatively small number of the vehicles currently accessing the area can be considered as subject to charges. On the other hand, an increased amount of cars accessing the area in the evening period (i.e. after 6:00pm) has been measured. The intention of Rome in the final part of the PRoGRESS project is thus to run the full scale ACS+RP, and to verify the effects of a road pricing scheme application in the evening period.

In Bristol a number of pilots have already taken place, along with extensive consultation. Building on this political foundation, the city is working towards implementing a full pricing system for the city centre. New obstacles have made it impossible to go through with the original demonstration activities. Bristol will do some further analysis and preparation for the final implementation, but the implementation of the RUC system will not come in the time frame of the PRoGRESS project. The demonstration is therefore redesigned and will now include a test of a distance-based charging system for commercial vehicles using a mobile positioning satellite (MPS) system.

Edinburgh has been carrying out the hearts and minds exercise with regard to urban road pricing for some time. They are now developing plans for the full congestion charging scheme. The operational framework for the charging scheme and the delivery of the associated transport investment package was established in 2002. The demonstration has been carried out for the retail mechanisms for the license purchase and for a video-based number plate recognition system for scheme enforcement.

Genoa is working with a RUC scheme for controlling the access to the city centre. A multi-modal modelling tool (MTCP30), which was developed in the PRESS project, has been used to investigate and define a feasible RUC scheme. In the PRoGRESS project, the city will demonstrate this scheme. A video-based recognition system will be implemented surrounding the city centre, but the trials will, for political reasons, be performed with volunteers.

Copenhagen is at the stage of initiating a political process on urban road pricing. The city aims at using the demonstration in PRoGRESS as the basis for this debate. The demonstration is using GPS technology to demonstrate both zone- and distance-based pricing strategies. Some 500 volunteers have participated in the trials, which ran from October 2001 until May 2003, in several stages. Gothenburg will also be doing tests with a distance-based pricing scheme using GPS technology. The trial in Gothenburg is

supported with modelling work. A number of pricing strategies is analysed with methodology developed in the PRESS project.

Helsinki is using the modelling concept from the PRESS project for developing several pricing strategies for the Helsinki metropolitan area.

Across the eight PRoGRESS cities, a wide range of pricing concepts and technologies will be analysed and demonstrated. Table 1 shows the combination of concepts and technology that will be tested.

Table 1 Pricing Concepts and Technologies Across the PRoGRESS Sites

Scheme concept	Road pricing technology basis			
	Paper based	Electronic tag	Video	GPS
Cordon (per trip)		Rome	Genoa Edinburgh	Bristol Copenhagen Gothenburg
Zone (per trip)		Trondheim		Copenhagen Gothenburg
Time-based		Rome		Copenhagen Gothenburg
Distance-based				Bristol Copenhagen Gothenburg

The most basic concept is a pricing cordon where vehicles are charged per trip or per day for crossing the cordon line. This can be further developed into a zone system where each trip across a zone boundary is charged. These charges may vary across different times of day and across different types of vehicles or user groups. This kind of concepts is being developed in Trondheim, Bristol, Edinburgh, Rome, and Genoa.

An alternative is to charge vehicles by time spent or distance travelled in a charging area. Again this charge can be differentiated by time of day and user group. Both Copenhagen and Gothenburg are carrying out demonstrations of this type of charging technique through their GPS system. Bristol is also doing a trial with a distance-based charging system, but mainly for commercial vehicles. Rome is analysing a concept where vehicles are charged according to the time they have spent inside the access controlled area.

The technologies used for existing RUC systems are virtual licences (Rome, London) and systems using electronic tags (Trondheim, Oslo). Several technologies are available i.e. electronic tags, number plate recognition by video, or GPS systems. Microwave-based tags with smartcard payment are considered the current state of the art, however GPS systems might provide a more flexible solution in the future.

In addition to the payment systems, a RUC system also needs an enforcement system. At the moment, automatic enforcement systems are only available for RUC where the charging is done at fixed points (tolling systems or area charging). For enforcement, hard evidence is needed. Manual systems might be used, but the technique used in most existing systems is number plate recognition based on video or digital photos.