

VATT-TUTKIMUKSIA
72
VATT-RESEARCH REPORTS

Jens Schade
Bernhard Schlag

ACCEPTABILITY OF URBAN
TRANSPORT PRICING

Valtion taloudellinen tutkimuskeskus
Government Institute for Economic Research
Helsinki 2000

ISBN 951-561-354-X

ISSN 0788-5008

Valtion taloudellinen tutkimuskeskus

Government Institute for Economic Research

Hämeentie 3, 00530 Helsinki, Finland

Email: schade@rcs.urz.tu-dresden.de

schlag@rcs.urz.tu-dresden.de

J-Paino Oy

Helsinki, 2000

Foreword

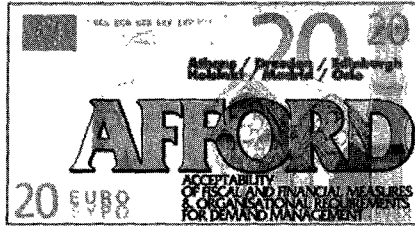
Studies on infrastructure are one of the central themes in the research programme of VATT. The reason for this is obvious: investments in infrastructure are typically a responsibility of public sector. The discussions concerning costs and benefits of the infrastructure investments are in the core of public economics.

This study is a part of the larger EU financed project called AFFORD. The project has been co-ordinated by VATT under the leadership of research director, Dr. Esko Niskanen. There are altogether eleven research European research institutes participating in this project. This project is tackling the problems of urban transportation. In large cities all over in the world, as well as in Europe the increasing traffic creates problems of congestion and other environmental effects. These problems are often considered as some of the main urban problems by political decision makers, as this report clearly shows. In the project AFFORD the main research question is whether by introducing road pricing one could alleviate the problems created and improve the efficiency of the use of public funds.

Pricing, though promising means to tackle the problem of urban transportation, is not, however, readily accepted. People usually consider roads as freely available public goods. Therefore one major aspect of the possible road pricing is the public acceptability. This study concretely deals with the acceptability of the road pricing as a means to improve the efficiency of the use of public infrastructure. It develops clear criteria for the evaluation of the acceptability. I think that the results are interesting and they are worth to be taken into account in further discussions on this theme.

Helsinki, December 29, 2000

Reino Hjerpe
Director-General



Acceptability of Urban Transport Pricing*

AFFORD

December 2000

Jens Schade**

Bernhard Schlag**

Project No: PL97-2258

Project Coordinator: VATT

Funded by the European Commission
4th Framework - Transport RTD

* This report is based on Schade J., Schlag B., Giannouli I. & Beier A. (2000): Acceptability of Marginal Cost Road Pricing. Deliverable 2C, Project AFFORD, funded by the European Commission, 4th Framework – Transport RTD. Technische Universität Dresden.

** Traffic and Transportation Psychology, Dresden University of Technology, 01062 Dresden, Germany

The AFFORD Consortium

Government Institute for Economic Research (VATT), Coordinator, *Finland*

University of Leeds (ITS), *United Kingdom*

Universidad Politecnica de Madrid (UPM), *Spain*

Institute of Transport Economics (TOI), *Norway*

Technische Universität Dresden (TUD), *Germany*

TRIAS SA Consulting (TRIAS), *Greece*

MIP - Politecnico di Milano (MIP), *Italy*

University of York (UYORK), *United Kingdom*

LT Consultants Ltd (LTCON), *Finland*

Center for Interdisciplinary Systems Research (C.I.S.R), *Greece*

Free University of Amsterdam (FUA), *The Netherlands*

SCHADE, JENS – SCHLAG, BERNHARD: ACCEPTABILITY OF URBAN TRANSPORT PRICING. Helsinki, VATT, Valtion taloudellinen tutkimuskeskus, Government Institute for Economic Research, 2000, (B, ISSN 0788-5008, No 72). ISBN 951-561-354-X.

Abstract: Several studies all over the world have considered transport pricing measures as promising attempts to solve urgent traffic problems in urban areas. An important precondition for the successful implementation of pricing measures is public and political acceptability. However, empirical findings show that the acceptability of such measures is rather low. The general objectives of this report are to assess acceptability of various urban transport pricing measures and policy packages, to analyse the reasons for the lacking acceptability and how this may be improved where appropriate. The relevant policy packages were derived from AFFORD Deliverable 1 (Milne, Niskanen and Verhoef, 2000). A public acceptability questionnaire survey was carried out in Athens, Como, Dresden and Oslo. The political acceptability survey was carried out as a phone interview with politicians in Como and Dresden.

Key words: public acceptability, political acceptability, transport pricing, urban transport

SCHADE, JENS – SCHLAG, BERNHARD: ACCEPTABILITY OF URBAN TRANSPORT PRICING. Helsinki, VATT, Valtion taloudellinen tutkimuskeskus, Government Institute for Economic Research, 2000, (B, ISSN 0788-5008, No 72). ISBN 951-561-354-X.

Tiivistelmä: Useat tutkimukset eri puolilla maailmaa ovat tarkastelleet liikenteen hinnoittelua lupaavana keinona ratkaista polttavia liikenneongelmia kaupunkialueilla. Menestyksellisen hinnoittelun toimeenpanon tärkeä edellytys on julkinen ja poliittinen hyväksyttävyyys. Empiiriset havainnot kuitenkin osoittavat, että hinnoitteluinstrumenttien hyväksyttävyyys kaupunkiliikenteessä on alhainen. Tämän tutkimuksen yleisenä tavoitteena on arvioida erilaisten hinnoitteluinstrumenttien ja politiikkapakettien hyväksyttävyyttä kaupunkiliikenteessä, selvittää alhaisen hyväksyttävyyden syitä sekä kuinka sitä voitaisiin parantaa. Tarkasteltavat politiikkapaketit on johdettu AFFORD Deliverable 1:stä (Milne, Niskanen ja Verhoef, 2000). Julkista hyväksyttävyyttä selvittävä kyselytutkimus käsitti Ateenan, Comon, Dresdenin ja Oslon. Poliittista hyväksyttävyyttä selvittävä puhelinhaastattelu toteutettiin Comossa ja Dresdenissä.

Asiasanat: julkinen hyväksyttävyyys, poliittinen hyväksyttävyyys, liikenteen hinnoittelu, kaupunkiliikenne

Acknowledgements

This report has benefited from the inputs of a large number of persons, including the entire AFFORD consortium. Among the AFFORD participants, the authors are particularly indebted to Esko Niskanen, Erik Verhoef, Lasse Fridstrøm, Pia Koskenoja, and Dave Milne for their assistance in clarifying the theoretical and empirical issues involved. A sincere appreciation to the site managers Astrid Beier, Lasse Fridstrøm, Ionna Giannouli and Ferdinando Stanta, for their work at various stages of the acceptability surveys. Important advice was also received from several persons outside the AFFORD consortium, most notably from Peter Jones, Amihai Glazer, Inge Mayeres and Juliane Paul, and besides by many persons participating in the various AFFORD workshops and seminars. We are grateful to Gunnilla Ystrøm which has provided background text (2.3) and Anita Niskanen for editing the print version. Last, but not least, thanks are due to the European Commission, for their financial support of the work, and in particular to thank Catharina Sikow-Magny, for her most constructive comments and suggestions and her dedicated support of the AFFORD project throughout its lifetime. However, the authors alone are responsible for the views presented in the report.

Executive summary

General aspects

Several studies and research projects all over the world have considered transport pricing measures and policies - including all kinds of road and parking pricing - as promising attempts to solve the urgent traffic problems in urban areas. With its green paper 'Towards fair and efficient pricing in transport' (1995) the Commission of the European Communities advocates the introduction of road pricing. An important precondition for the successful implementation of pricing measures is public and political acceptability. However, empirical findings have shown that the acceptability of such measures is rather low.

The general objectives of this report are to assess acceptability of various urban transport pricing measures, to analyse the reasons for lacking acceptability and how this may be improved where appropriate. The more detailed objectives of this report are (i) to identify key issues, and different interest groups, related to acceptability; (ii) to develop and use a framework for conceptual, theoretical and empirical analysis of acceptability of transport pricing measures; (iii) to assess public and political acceptability of the specified pricing measures; (iv) and to analyse the prerequisites for acceptability.

Within the **theoretical framework** of urban transport pricing acceptability various interest groups who influence the introduction of these measures can be identified. Besides the affected motorists, these groups are above all the politicians as the key decision-makers and the business community. The model of road pricing acceptability (Schlag, 1997; Schlag & Teubel, 1997; Schlag, 1998) defines the following essential issues determining the acceptability of the proposed evolution:

- (i) *problem perception*: the perception of traffic related problems is a necessary precondition for regarding problem-solving measures as important;
- (ii) *mobility related social norms* as the perceived social pressure to accept measures like road pricing;
- (iii) *important aims to reach* by the measures: these aims can compete with certain mobility related aims of various interest groups. The potential conflict that may arise between these perhaps different aims is crucial for the question of acceptability;
- (iv) *information and awareness* of options: people have to know and understand projected measures. They have to be aware of the background, the aims as well as the specific ways, in which the measures are implemented in practice;

- (v) *perceived effectiveness and efficiency*: the proposed measures have to be perceived as an effective and efficient mean to control traffic problems;
- (vi) *equity*: first of all in the sense of a distribution of costs and benefits as being fair. Here, equity is tentatively operationalized as personal outcome expectations. An important distinction is made between *intrapersonal*, *interpersonal* and *alternatives* on which the evaluation of outcome expectations may be based;
- (vii) *revenue allocation*: public acceptability strongly depends on how the revenues are used. Hypothecating revenues increases public support considerably;
- (viii) *attribution of responsibility* for the solution of perceived traffic problems. If people consider themselves as at least partly responsible for solving the problems (*internal* as compared to *external* attribution), this should lead to increased agreement with measures that raise the price of or restrict car use.

Public acceptability

A public acceptability questionnaire survey was carried out in Athens, Como, Dresden and Oslo (total N = 952 motorists exclusively). The pricing/policy packages were derived from AFFORD Deliverable 1 (Milne, Niskanen & Verhoef, 2000). Two packages (strategy A and strategy B) were applied in all cities whereas the site specific strategy allows for local circumstances. Strategy (A) is 'best practice second best', the so-called '*strong*' package comprising time-differentiated cordon pricing and an increase in parking charges and fuel taxes as well as some way of revenue hypothecation. Strategy (B) is 'acceptable', the so-called '*weak*' package also - but to a lower extent - comprising cordon pricing as well as an increase in parking charges and fuel taxes, and revenue hypothecation. The main *descriptive* results are as follows:

The perception of traffic-related problems is a necessary precondition for regarding problem-solving measures like road pricing as important. In general there is a high **perception of mobility related problems**. In the four European cities air pollution and traffic congestion are the problems which are perceived as most pressing. Negative expectations about the development of the perceived problems are predominant, which contributes to a rather pessimistic view of the overall situation.

The direct evaluation of the two AFFORD strategies reveals the following results (tab. 0-1): The subjective level of **information** for both strategies is very low. This is no surprise because the measures are new. However, there are differences between the sites. The knowledge about the measures is very low in Dresden and Oslo and rather low in Athens and Como. This gap could be due to the following: a) in Oslo the question referred to the objective knowledge because there already

exists a specific pricing system; b) in Dresden as well as in all former socialist countries knowledge about pricing instruments in general is low. On the other hand in Athens and Como the respondents seem to feel slightly better informed about the measures.

The **perception of the effectiveness** of the two strategies to reduce inner city traffic is much higher than the information level. These overall higher scores for effectiveness than for awareness may indicate that respondents believe that demand management is to some extent capable of successfully addressing current transport problems. Accordingly, the public seems prepared to trust these measures to a certain degree, even where they are new and unknown. Concerning the personal outcome (as a first and easy to communicate approximation to **equity**) the majority of the respondents expects more disadvantages for themselves following from the introduction of road pricing.

Table 0-1: Overall evaluations of strategies 'best practice second best' (A) and 'acceptable' (B).

	Strategy	Information	Perceived effectiveness	Personal outcome expectations (equity)	Social norm	Acceptability
Total sample	A	1.50	2.39	-.21	1.93	1.80
	B	1.48	2.34	-.16	2.22	2.22
Athens	A	1.70	2.51	.07	2.25	1.96
	B	1.69	2.56	.30	2.41	2.29
Como	A	1.92	2.23	-.39	2.08	1.80
	B	1.72	2.38	-.28	2.21	2.17
Dresden	A	1.32	2.37	-.60	1.70	1.65
	B	1.39	2.37	-.37	1.98	2.07
Oslo	A	1.23	2.50	.16	1.85	1.85
	B	1.27	2.15	-.11	2.37	2.38

All mean values can vary from 1 (e.g. know nothing at all, absolutely unacceptable) to 4 (know a lot, totally acceptable) with the exception of personal outcome expectations (equity) where values can vary from -1 (expected disadvantages) to +1 (expected advantages).

In general, the stated **acceptability** of both strategies, the 'best practice second best' strategy and the one assumed as rather 'acceptable' is low. As expected, rejection is stronger regarding the stronger strategy A. But there is a significant increase of support from strategy A to strategy B. Nevertheless, the majority of respondents does not accept the so-called 'acceptable' strategy B either. But, there are still differences between the four sites (tab. 0-2).

Table 0-2: Ranking of acceptability (% rating the strategy as rather or totally acceptable).

Strategies	Support in %				
	A	Total 20	Athens 25	Oslo 24	Dresden 17
B	39	Oslo 48	Athens 43	Como 34	Dresden 31

In Dresden rejection of both strategies is very strong. Refusal is also very strong in Como. In Oslo there is a strong rejection of strategy A but strategy B is rather accepted. In Athens the attitudes towards both strategies are generally less negative. Thus, even if a package solution with transparent revenue hypothecation receives stronger support than single pricing measures (Jones, 1991b; Keränen, Schade, Schlag & Vougioukas, 1999; Schade, 1999; Schlag & Teubel, 1997), the packages tested here find no majority among the motorists. However, compared to the 'strong' strategy A the acceptability of the 'weak' strategy B pricing has nearly doubled.

The **responsibility** for the solution of the perceived problems is mainly attributed to public entities like the municipality, the state or the public transport companies whereas a majority of respondents denies to be personally (jointly) responsible for the solution of problems. Furthermore the overall opinion concerning a limitation of inner city traffic is clear. Almost three fourths of all respondents support a limitation. But if it comes to a reduction of personal car trips the opposite result appears. 65% of all respondents state that it would be difficult to reduce car trips substantially. So, which car trips would the respondents be willing to reduce? In general slight effects on shopping trips are expected and also some effects on leisure trips. Work trips have the lowest self-reported price elasticity.

Factors influencing the degree of acceptability

Multivariate statistical methods like factor and regression analyses were used to investigate the questions how the low level of acceptability for the various pricing measures can be explained and which factors influence the degree of acceptability. The analyses show that in particular the variables 'social norm', 'perceived effectiveness', 'personal outcome expectations' and the 'approval of societal important aims' are positively connected with the acceptability of pricing strategies. That means, an individuals acceptability of a pricing strategy is stronger (increases),

- the more social pressure to accept the respective strategy is perceived,
- the more pricing strategies are evaluated as effective,
- the more personal advantages following from the introduction of the measure are expected and
- the more societal important aims are approved of.

In a more precise analysis two problem perception patterns have been found. The first one comprises the perception of problems connected rather directly with the road-use (congestion, lack of parking space etc.), while the second pattern refers to the perception of rather indirect, more environmental problems resulting from traffic (e.g. air pollution, noise). Surprisingly a rather contrary effect of the high evaluation of direct traffic problems on the acceptability of pricing measures was identified, whereas for the environmental problem awareness no or a rather positive effect could be shown. On the other hand the results reveal that socio-economic characteristics (e.g. income) of respondents influence the perceptions, attitudes and evaluations towards the pricing strategies only to a low extent. Furthermore, no indications were found that respondents justify their rejection of painful policies by claiming that they perceive them as ineffective. Thus, the hypothesis of a 'strategic response' on perceived effectiveness does not apply (Rienstra, Rietveld & Verhoef, 1999).

Political acceptability

Without the support of politicians as the key decision-makers the introduction of any road pricing scheme is impossible. Therefore the politicians' opinions and the acceptability regarding pricing measures are of great importance for the implementation of road pricing. The political acceptability survey (here: on a local level) focused on two important points:

- First on the politicians' attitudes towards road pricing. This comprises the central constructs of the acceptability model as outlined above.
- Secondly the politicians' perception of public acceptability. Recent studies report a significant difference between politicians' views and the actual public attitudes, which leads to the consequence politicians perceive the public voting much more 'pro-car' than is the case.

The survey was carried out as a phone interview with politicians in Como and in Dresden (N = 14). At least one politician of every party acting in the current city council participated (mostly the 'traffic speakers').

Results

The politicians state a high awareness of traffic problems even compared to other municipal problems like economic growth or city finances which are considered as less important. In more detail, Como politicians perceive public transport, congestion and air pollution as the most pressing, and Dresden politicians consider congestion, traffic noise and air pollution as most pressing. Altogether, the majority of the politicians agree with a limitation of inner city traffic.

The public problem awareness is estimated quite well by Como politicians, whereas Dresden politicians underestimate considerable parts of public awareness of problems like air pollution and traffic noise. In both cities the

public's opinion on traffic restrictions is rated only slightly lower than the politicians' own opinions.

The politicians' evaluation of both the effectiveness and the personal acceptability of the presented strategies is surprisingly positive. Although the 'stronger' strategy A is still mainly rejected, the majority of interviewed politicians considers strategy B, which also contains cordon pricing, as at least rather acceptable. So, the politicians' acceptability of pricing policies is clearly higher than expected. In the contrary, especially in Dresden, the public's acceptability is clearly underestimated. The politicians seem to fear an even stronger rejection of pricing strategies by the public than actually is.

Considering an acceptability level of ca. 50% of the public being necessary for a positive political decision, a well prepared introduction of a measure like strategy B does not seem so unrealistic anymore.

However, besides the voters also other groups have a substantial influence on political decisions, and so are able to hinder the introduction of pricing policies. In particular, the influence of the media (and of interested pressure groups using media) has not sufficiently been considered, yet.

Consequences - Some notes to enhance marginal cost based pricing acceptability

Considering the introduction of transport pricing strategies to solve urban traffic problems the decision-makers should take the following principles into account:

- (i) **The objectives of the pricing strategy have to meet main public concerns.** Politicians and the public regard traffic problems in cities as a very important and urgent issue. There is a search for solutions. Thus, marginal cost pricing ought to give rise to ecological benefits and to reduce congestion (and these have to be communicated); safety contributions and other advantages must be perceived and it should meet positive social norms.
- (ii) **Pricing strategies have to be perceived as very effective solutions,** if not as the only effective solution for the perceived traffic problems. People are used to regard public roads as 'free' goods, therefore there will be strong emotional resistance to any attempt for charging their use. If people shall accept charges for road use and for parking they have to be given convincing reasons. Perhaps the best reason is, that pricing is the best way of solving perceived urgent problems. The effectiveness of transport pricing may be high, but it is not guaranteed and depends on the definition of objectives. The efficiency will be comparatively very high, but only from the cities', not the motorists' point of view. Thus, not only the objectives of the intended measures must be highly valued by the public, people must also believe that their behaviour contributes to reach

these objectives. The values as well as the expectations (the perceived probability to reach these objectives) ought to be made transparent and first trials of a new behaviour must be successful so that the new behaviour is perceived as effectively contributing to reach the shared values, thus creating positive contingencies between the behaviour and its consequences.

- (iii) **Revenues must be hypothecated and alternatives have to be provided.** People want to get something for their money. Thus, there must be a package solution, combining traffic restraints and road charging with a set of transport and environmental improvements.
- (iv) **Fairness** issues have to be considered very carefully. The system must be perceived as fair in particular relating to the personal cost-benefit-relation. The benefits people see for themselves must balance the costs at least in an immaterial way (e.g. by reaching other valuable objectives). In addition, people should not feel to be treated unjust in comparison to others. An important role in this context plays the use of the revenues. With the help of the raised charges it is possible to influence the distributional impacts in the desired direction. Hypothecation of revenues must result in guaranteeing a desired level of mobility for all, even supporting mobility chances for some groups, thus meeting equity issues on a population level.
- (v) **Public acceptability can only be expected if people have confidence** in the effectiveness of the measure, the use of the revenues, the fairness and anonymity of the system. One precondition to support confidence is *transparency* of the intended measures at an early stage. In connection with transparency people's commitment towards the new ideas, perhaps creating some identification with the proposed package of measures. This commitment depends on early and credible communication, on positive experiences (at least by models), on the conviction that this is an effective solution, and on perceived chances of *participation*. People want to see themselves as having at least some degree of control over the things they are affected by. Thus, there is a connection between participation, commitment, acceptability and later effectiveness. This points out the importance of early information and participation of people even in concept development. A second precondition for creating confidence is defined responsibility; i.e. who will be responsible for the functioning of the system, for charging and accounting, for revenue allocation, for failures and undesired effects? This has to be defined clearly before implementing the system. Responsibility issues are of particular relevance in connection with the debate of privatisation. And finally, to meet the above requirements it is necessary to design a strategy to communicate on the measures.

- (vi) **The necessary publicity calls for an intelligent communication strategy.** The communication strategy only works if it covers the whole package. In order to build a successful communication strategy several principles should be considered which are finally outlined.

Contents

Executive summary

1 Introduction	1
2 Theoretical Framework of Urban Transport Pricing Acceptability	5
2.1 The Role of Acceptability	5
2.1.1 Definition of the Terms 'Acceptance' and 'Acceptability'	5
2.1.2 Key Stakeholder Groups	5
2.1.3 How to Measure Acceptability?	7
2.2 A Model of Road Pricing Acceptability	7
2.2.1 Problem Perception	9
2.2.2 Important Aims to Reach	11
2.2.3 Information	12
2.2.4 Perceived Effectiveness and Efficiency	13
2.2.5 Equity	13
2.2.6 Social Norms, Perceived Behavioural Control and Intentions	16
2.2.7 Attribution of Responsibility	17
2.2.8 Socio-Economic Impacts	17
2.3 Experience from an Existing Pricing System: The Oslo Toll Ring	18
3 Public Acceptability	21
3.1 Introduction	21
3.2 Survey Method	21
3.3 The Marginal Cost Based Pricing Strategies	22
3.4 Sample Description	24
3.5 Site-Specific Results	26
3.5.1 Athens	26
3.5.2 Como	38
3.5.3 Dresden	47
3.5.4 Oslo	57
3.6 Overall Results	68
3.6.1 Total	68
3.6.2 Site for Site Results	76
3.7 Factors Influencing the Degree of Acceptability	80
3.7.1 Factoranalytical Results	80
3.7.2 Regression Analysis	85
3.8 Summary and Discussion	93
3.8.1 Descriptive Results	94
3.8.2 Predicting Acceptability	95
4 Political Acceptability	99
4.1 Introduction	99

4.2 Survey Method.....	101
4.3 Results.....	101
4.3.1 Sample description	101
4.3.2 Politicians own perceptions of problems and their perceptions of public viewpoints	102
4.3.3 Politicians attitudes and evaluations with regard to the three packages...	103
4.3.4 General evaluations of political decisions	107
4.4 Summary and Discussion.....	108
5 How to Enhance the Acceptability of Urban Transport Pricing?	111
5.1 General Rules.....	111
5.2 Some Communication Principles.....	112

References

Appendix A: Public Acceptability Questionnaire

Appendix B: Political Acceptability Questionnaire

1 Introduction

The direct and indirect effects of the further growing motorised individual traffic are very diverse. However, the large benefits of car traffic are opposed by considerable negative consequences: Congestion - for instance - not only causes (time-) costs but also environmental damage, land consumption, landscape cutting, air pollution, noise, accident victims and the consumption of non-renewable sources of energy (Commission of the European Communities, 1995). To limit these negative consequences first of all technique-based modifications were used. For instance:

- reduction of vehicles' energy consumption;
- reduction of emissions produced by vehicles;
- improvements in safety of cars and roads;
- telematic applications which improve the effectiveness of traffic etc.

Whilst these technological options reduce the negative impacts of traffic (growth) to some extent, they can not eliminate it completely. Therefore increasingly behaviour-influencing measures, are being discussed (OECD, 1997).

An alternative definition of the ways in the impact of car usage can be reduced, these are commonly called 'the three E's' (Schlag, 1998), is described below:

- *Enforcement*: legal measures, mainly rules and bans, as behaviour-influencing preconditions for a guarantee of a safe traffic and transport;
- *Engineering*: an altered arrangement of supply, affecting the routes for the different means of transport as well as the means of transport themselves;
- *Education*: measures of education, instruction and information of - first and foremost - the vehicle drivers.

As a further possibility for influencing mobility, a fourth 'E' is to be considered: fiscal incentives, such as road user fees named '*Encouragement*' or '*Economy*'. Within other areas, e.g. telecommunications or energy use (Bell, Fisher, Baum & Greene, 1990), pricing systems have proved to be very effective control means. For road pricing the effects of prices on traffic demand are in the centre of attention. With a spatial-temporal variation of transport costs the efficiency of traffic in high-density areas shall be increased (Milne, Niskanen & Verhoef, 2000).

Transport policies have in the past focused largely on direct regulation (enforcement). Whilst rules have brought significant improvements in some areas (e.g. safety), they have not been able to unlock the full potential of response options that can be triggered through price signals. Price based policies give citizens and businesses incentives to find solutions for certain problems. The objective of ensuring sustainable transport requires that prices reflect underlying scarcities which otherwise would not be taken into account sufficiently.

Decisions made by individuals with respect to their choice of mode, their location and investments are at least partly based on prices. So prices have to be reasonable to improve transport.

In general the following fiscal elements can be identified within the cost of mobility (cp. Schlag, 1998, 309):

- **Capital and vehicle taxes** - purchase and sale's taxes, value-added tax (VAT), motorcar tax (annual), costs of the acquisition of the driving licence.
- **indirect running taxes**, which enable the access to the use of a road space and which are not to be paid in direct connection with the traffic behaviour. E.g. fuel tax, resident parking fees, monthly ticket for public transport, motorway fees (for goods- and passenger-transport) cordon tolls, road and bridge tolls - as long as not referred to single passages or drives (monthly tickets etc.)
- **direct taxes (referred to use)**, which are limited to the individual range of use (spatial and/or temporal). E.g. taxi costs, parking fees (per time of use), ticket for public transport (per trip), weight-distance-fees for lorries and busses, cordon tolls, road and bridge tolls - referred to single passages and drives, automatically measured road using fees.

Technological research has already resolved many of the practical requirements for the introduction of sufficiently flexible pricing schemes. However, apart from technological and legal problems the lack of public and political acceptability turned out as one of the main obstacles to the implementation of road pricing measures. Acceptability of systems is assumed to be of major influence on the effectiveness of the implementation of a system (Van der Laan, 1998). Numerous studies give evidence for the rejection of pricing measures by a majority of car drivers (e.g. Bartley, 1995; Jones, 1991a,b; Keränen, Schade, Schlag & Vougioukas, 1999; Luk & Chung, 1997, Schlag & Schade, 2000). For instance, the results of the TransPrice-study¹ show that - with only little variation between the cities - improvement of public transport takes the first place in acceptability, followed by propositions of access restriction for the inner cities, and - with a big gap - a reduction of parking space. Least accepted are generally fees concerning both the stationary traffic (parking fees) and the usage of roads (distance based pricing), even if it is only at times with high volume of traffic (congestion pricing/peak-load pricing). But here there are some clear differences between the surveyed cities. In general, the people interviewed favour - as expected - such interventions which broaden the people's freedom of action. Still, it surprises that even clear restrictions are more accepted than pricing measures. This may be put

¹ EU-project TransPrice: 'Trans Modal Integrated Urban Transport Pricing for Optimum Modal Split'.

down to rules and bans already having been introduced to the traffic sector; perhaps they are also felt as being fairer.

Thus, lacking acceptability was the main reason for the most planned road pricing projects not leaving the field-trial stage (exceptions in Europe: Oslo, Bergen, Trondheim)². The question about the reasons for this almost unanimous refusal arises in particular for the motorists concerned. Frequently mentioned arguments against road pricing with regard to acceptability are fears of a violation of privacy (e.g. Keuchel, 1992), insufficient transparency of revenue use, and discrimination against socially weaker groups (Teubel, 1997). In the public there seems to be a general information-deficit concerning price-based travel demand management (TDM) measures. Public transport improvements and access restrictions are the best known measures. But only 9% of more than 1400 interviewed car drivers of the TransPrice study stated to know a lot about road pricing (Schlag & Schade, 2000). Last but not least it is to be assumed that the willingness to pay for something which was previously regarded as more or less free might be small (Jones, 1995).

The theoretical and empirical findings so far raise several questions which will be addressed in this report:

- a) How high is the current acceptability level of various urban road pricing strategies? Are there any changes or developments compared to earlier EU research-projects like TransPrice?
- b) Which factors influence the degree of acceptability?
- c) How can the low level of acceptability of pricing strategies be explained?
- d) How can the acceptability of pricing strategies be increased?

The report is organized as follows:

In *section 2* the theoretical framework for acceptability analysis is outlined. A definition of used terms is provided in section 2.1.1. The different interest groups influencing the introduction of pricing strategies are identified in section 2.1.2. Section 2.2 reports in detail the main factors influencing the acceptability of pricing strategies.

Section 3 deals with the public acceptability of marginal cost based pricing. After an introduction (3.1) the method of the questionnaire surveys which were carried out in Athens, Como, Dresden and Oslo is outlined (section 3.2). Then, the marginal cost based pricing strategies which were to be evaluated by the respondents and the examined sample (section 3.4) is described. Sections 3.5 (site-specific results) and 3.6 (overall results) mainly deal with the present acceptability level of the different pricing strategies. The question which factors

² For a detailed description of the Oslo toll ring system and its public acceptability see section 2.3.

influence the degree of acceptability is investigated in section 3.7 by using multivariate statistical methods. Finally, against the background of the theoretical considerations outlined in section 2, the results are discussed (section 3.8).

In *section 4* the political acceptability analysis is presented. Section 4.1 outlines the problem background of political decisions and the relation between attitudes of the politicians and perceptions of the public opinion. Section 4.2 describes shortly the used survey method and section 4.3 presents the results of the political acceptability survey. After a description of the sample (section 4.3.1), the politicians' own perceptions of traffic problems and their perceptions of public viewpoints (section 4.3.2), the politicians' attitudes and evaluations towards the pricing strategies (section 4.3.3) as well as the general evaluations of political decisions are reported. In section 4.4 some general conclusions are drawn.

In *section 5* some general rules are outlined about how to enhance the acceptability of transport pricing.

2 Theoretical Framework of Urban Transport Pricing Acceptability

2.1 The Role of Acceptability

2.1.1 Definition of the Terms 'Acceptance' and 'Acceptability'

The definitions of 'acceptance' are inconsistent. In some definitions the term 'to accept' is described as 'to receive willingly something given or offered' or 'to give an affirmative reply to something' (Hornby & Growth, 1995). Elsewhere it is described as 'to respond/react favourably to'. First of all, one has to distinguish between attitudes on the one hand and behaviour on the other hand. In general, attitudes are described as an evaluation of an object or of a behaviour in one way or another. Eagly & Chaiken (1993, p.10) define an attitude as 'a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor'. In terms of attitudes 'acceptance' would be defined as an affirmative attitude towards a specific object like road pricing. In terms of behaviour 'acceptance' could be defined as a behaviour which corresponds with the aims and objectives of the system to be implemented. Thus, the objectives and the desirable behaviour patterns have to be defined in advance.

To prevent inaccuracy of terms like 'behavioural acceptance' and 'attitudinal acceptance' the term 'acceptability' is introduced. 'Acceptability' refers to the (affirmative) *attitude* towards a specific object. That's why it is something more hypothetical, whereas 'acceptance' is related to some kind of *behaviour* as an (re-) action towards an object (here: road pricing).

Attitudes are, first of all relevant before the measure is introduced, i.e. when the people are unfamiliar with the proposed concepts. When the measure is introduced, there is the assumption that the previous attitudes, among other things, guide the people's behaviour (e.g. resistance, support, acting in accordance with the measure etc.). A more pragmatic definition is given by Van der Laan (1998, p. 39). She defines 'acceptance' behavioural 'as the absence of resistance to the implementation of a system'. In the case of this investigation we mainly deal with attitudes (respectively 'acceptability') because with the exception of Oslo in none of the surveyed cities road pricing has been introduced, yet.

2.1.2 Key Stakeholder Groups

The Demand Management Paradox (Bartley, 1995, see fig. 2.1-1) illustrates the complexity and interconnectedness of the general decision-making process when

it comes to implementing potential demand management schemes. New strategies as considered in AFFORD invariably have to satisfy a number of key groups before they can be adopted:

- (i) the *motorists* as the main persons or group affected by the measure (Public Acceptability),
- (ii) the *politicians* as the key decision-makers (Political Acceptability),
- (iii) the *business* community,
- (iv) *institutional* agents (e.g. authorities).

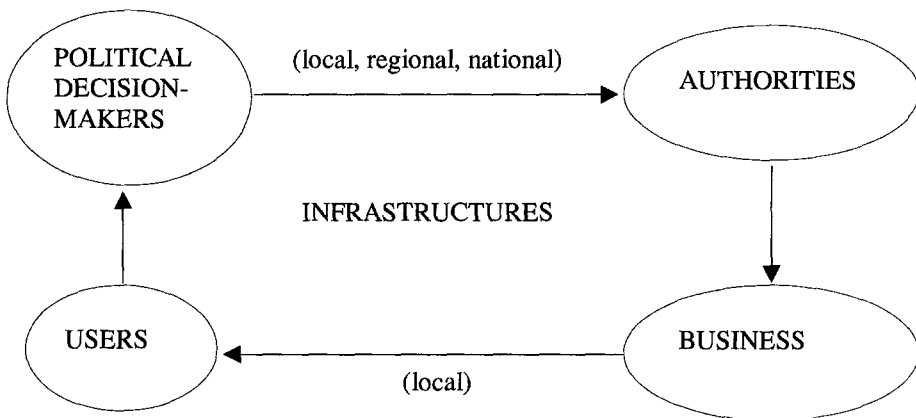


Figure 2.1-1: The Demand Management Paradox (Bartley, 1995, modified by the authors).

The measures to implement first of all address the users; in the case of road pricing these are the motorists. According to Lucke (1995, p.118) the addressees' acceptance is „the precondition for the putting-through, for the maintenance, and for the spreading of techniques, policies [...] and laws.“ An introduction of road pricing without being accepted by the motorists is indeed impossible. However, in this case the effectiveness and the functioning of road pricing during the operating phase is to call into question (Schlag, 1998; Van der Laan, 1998). On the other hand, the groups involved have different interests, but depend on each other (Goodwin, 1989). Thus, the users, for instance, represent possible voters for the politicians, whereas the authorities have to make their decisions within the area of conflict between politics and business. So, a measure X to be introduced might not meet the interests of all groups involved. This, in turn, makes an introduction of the respective measure more difficult. In AFFORD the complete decision-making process cannot be examined, but the demand management-paradox makes the identification of the key stakeholder groups easier. Over and

above that, other groups, who are at least indirectly involved in the discussion about the introduction of road pricing, can be determined, i.e. lobbies of the persons affected (e.g. automobile associations, employers' federations), ecology groups, other lobby-groups, and the media (press, broadcasting).

2.1.3 How to Measure Acceptability?

Rienstra, Rietveld, & Verhoef (1999) describe the various types of analyses which can be applied to investigate the acceptability of transport policies. *First*, the acceptability can be predicted by means of theoretical models which assume rational behaviour of individuals. If one looks on other areas (e.g. nuclear energy), research has shown that this solely rational approach does not cover all important issues (see Pligt, 1995). *Second*, empirical studies can be applied, e.g. by setting out questionnaires and interviewing people. *Third*, ex post studies can be carried out by investigating behavioural changes of individuals due to the measure. The way the behaviour changes may be an indication of the acceptance of the measure. At the moment this type of research is less relevant (but in future it will become more important) because transport pricing measures have not been introduced yet. The AFFORD project adopts on both theoretical and empirical investigation.

2.2 A Model of Road Pricing Acceptability

Since the late eighties / early nineties questions concerning the acceptability of road pricing measures have become increasingly relevant. Giuliano (1992) puts this down to the renewed interest in implementing pricing measures in urban areas. At the same time significant barriers to road pricing are still to consider. Examination of the public acceptability deficit therefore has concentrated on two questions which, however, have been mixed up with each other rather frequently (e.g. Giuliano, 1992; May, 1992). These two questions are:

- (i) Why are road pricing schemes not accepted by the public?
- (ii) How should publicly/politically acceptable pricing schemes be designed?

A variety of public concerns regarding electronic road pricing systems have already been identified, for example: misunderstanding (complexity), equity/fairness issues, privacy issues, or tax resistance (see e.g. Giuliano, 1992; Jones, 1991ab, 1995, 1998; May, 1992; Goodwin, 1989). More recently public opinions and reflections about road pricing have been studied with the help of attitude surveys, in which more factors have been found (see first of all Jones, 1991, 1995ab). But statistical analyses of the interdependence of the investigated factors with acceptability in particular have been missing so far.

Studies investigating prerequisites to acceptability of road pricing explicitly in an empirical way have so far been rare. Bartley (1995) presents results of the EU-

project MIRO that aimed to measure users' awareness of urban traffic problems on the one hand, and their awareness, perceived effectiveness and acceptability of various policy measures on the other hand. The main conclusion is, that user awareness is loosely related to user acceptance subject to belief in the effectiveness of the relevant scheme, while he finds only few systematic inter-relationships between socio-economic, location-based or mobility-related variables on the one hand and acceptability of TDM-measures on the other hand. A similar study was conducted by Rienstra et al. (1999) who found a relation between problem perception, perceived effectiveness and acceptability. In summary it can be said that present research has identified a lot of criteria and conditions which may influence road pricing acceptability. The few studies that tried to determine acceptability conditions empirically are lacking in a sufficient theoretical basis to describe and explain the phenomena satisfactorily.

In other traffic-related fields the acceptability construct has been researched more exactly, especially for the implementation of new technical systems like automatic violation registration-systems or speed control-systems (e.g. Rothengatter et al., 1991; Van der Laan, 1998). Here, the acceptability of the respective system has been seen first of all as determined by attitudes and influenced by additional system-specific characteristics. In many cases the social psychological attitude-theory of planned behavior (Ajzen, 1988) that describes the relation between attitudes and behaviour has been used as a theoretical basis. Although at present a general acceptance theory does not exist, it is undisputed, that attitudes are of great relevance for agreeing or disagreeing with something. In this connection the theory of planned behavior (see section 2.2.6) constitutes a well tested and economical framework.

The model by Schlag (Schade, 1999; Schlag, 1998; Schlag & Teubel, 1997) attempts to integrate the single conditions first of all identified by Jones into a heuristic model by means of the theory of planned behavior. The theory of planned behavior differentiates the theory of reasoned action as one expectancy-value theory³ (e.g. Ajzen, 1988, 1991). Ajzen's theory takes up and extends the economic rational choice approach.

The model states several central variables being in connection with road pricing acceptability (Schade, 1999; Schlag, 1997, 1998):

- (i) perception of traffic problems as pressing (problem perception),
- (ii) important aims to reach,
- (iii) information and awareness of options,
- (iv) perceived effectiveness and efficiency of the measure,

³ The basic assumptions of the expectancy-value-theory are: what behaviour is undertaken depends on the perceived likelihood that the behaviour will lead to the goal and the subjective value of that goal (cf. Weiner, 1992).

- (v) the users' specific relationship to the car, in this context especially perceived privacy,
- (vi) use of the revenues raised by road pricing (revenue allocation, hypothecation),
- (vii) equity, first of all in the sense of a distribution of costs and benefits perceived as being fair,
- (viii) social norms and perceived behavioural control (Ajzen).

In the following the key variables will be described in short (see also fig. 2.2-1). After that, hypotheses will be derived from the variables⁴. Furthermore, a new but possibly important variable of influence shall be discussed (cp. Schade, 1999):

- the attribution of the responsibility for causation and solving of traffic problems.

2.2.1 Problem Perception

The perception of traffic-related problems is a necessary precondition for regarding problem-solving measures as important (Steg & Vlek, 1997). That means firstly, that consequences of traffic are perceived, and secondly, that these consequences are judged to be problematic or damaging. Expected future changes are also of importance: are these problems expected to get worse or better.

Thus, the perception of problems may influence the support for or rejection of policy measures. This holds for the perception of two different aspects. On the one hand it is to be assumed that people who feel personally affected by a (severe) problem or threat would support measures to overcome this personal problem. This assumption is supported by the theory of protection motivation (Rogers, 1983). It postulates that individuals think about changing their behaviour only when they believe that keeping to this behaviour (here: the actual traffic situation) would sooner or later lead to severe negative consequences for themselves, that is when they are, or feel to be personally affected. On the other hand, there is empirical evidence that the evaluation of a perceived state as a 'societal problem' (the so-called general problem perception) without being personally affected by the problem leads to an increase of support for measures to overcome this problem (e.g. Kals, 1996a).

In the study here it has to be ascertained, whether the acceptability of road pricing measures is connected with the perception of problems resulting from traffic. The assumption is, that a high problem perception leads to an increased dealing with options for solving the perceived problems. Thus, this is one precondition for road pricing acceptability.

⁴ For a more detailed description see Schade, 1999; Schlag, 1998; Schlag & Teubel, 1997.

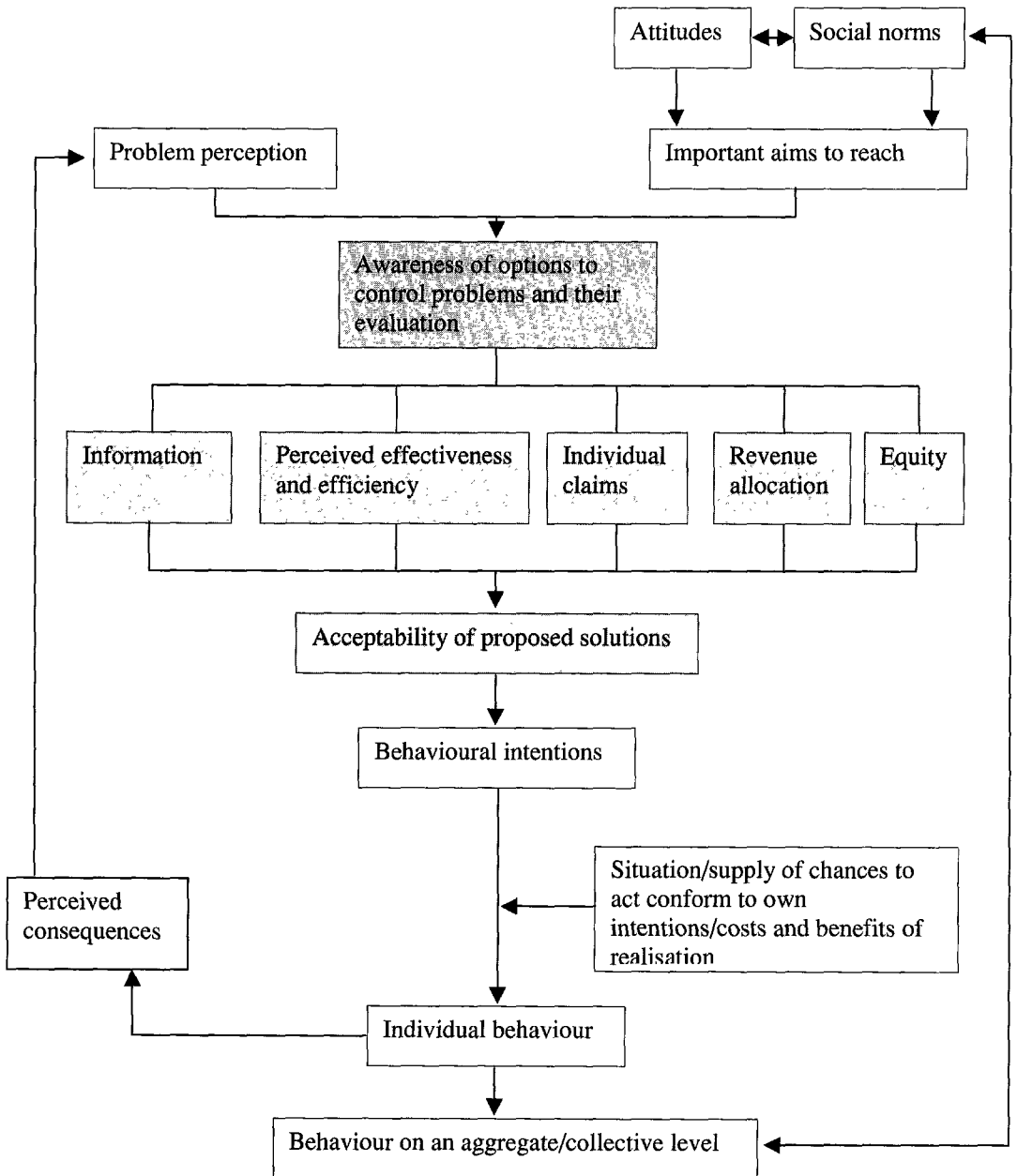


Figure 2.2-1: Structure of acceptability issues (Schlag & Teubel, 1997, 136).

2.2.2 Important Aims to Reach

There are different general aims that can be connected with road pricing measures (e.g. financial aims, ecological aims, demand management etc.). On the other hand, motorists as well as others pursue certain mobility aims. The potential conflict that may arise between these perhaps different aims is crucial for the question of acceptability. So, for instance the demand for restriction of car traffic could be declined with the explanation, that this would set a limitation to personal liberty. Car drivers often are convinced of a right to use their cars whenever they want to. But the problem is, that in principle a big number of competitive aims and interests is imaginable.

One possibility to deduce mobility aims in the context of road pricing is to apply the 'social ecological dilemma' to traffic situations (Ernst & Spada, 1993). A social ecological dilemma is characterised by two aspects which are closely related. One is the use of a natural self-regenerative resource (e.g. fish population) which is limited by its capacity to grow again and can seriously be impeded by a too strong exploitation (over-fishing). In addition gains of the use build up immediately, while losses by damaging occur only with considerable delay. The negative short- and long-term consequences for a certain resource are called *ecological aspect*. The other, the *social aspect* is that a gain of using the resource is of benefit to each person in a very individual way, whereas a possible damage by a too strong exploitation has a negative effect on the community as a whole. The structure of the social ecological dilemma can be applied for example to the formation of traffic congestion. In this context road pricing would represent the attempt to restrict damages for the general public (less congestion) by reducing the personal advantage (using the resource, i.e. the road, is to be paid) and to limit negative long-term consequences to the community in a perceivable short-term way to the individual itself. This is expected to have strong impacts on the motivation to show the problematic behaviour.

Ernst & Spada (1993) investigated the question, what human behaviour in social ecological conflicts essentially depends on. Apart from the knowledge of ecological and social problems, personal aims proved as crucial determinants of ecological behaviour. In numerous experiments two kinds of aims appeared as particularly characteristic: orientation by resource or group versus orientation by relative gain maximisation. In simulations of social ecological dilemmas participants orientated by resource or group wish the resource to be as intact as possible and try to keep a fair compensation within the group. In comparison, gain orientated players are above all interested in high proceeds from using the environment, combined with the aim to maximise the gain compared with the competitors. Applying this knowledge to the sphere of mobility it can be emphasised that resource and group orientated aims, like preference of bus and railway or air improvement, are in accord with those of road pricing. On the other hand personal aims of gain maximisation, like 'I would like to use my car,

whenever I want', compete with those of road pricing. It could be concluded, that a higher valuation of common social aims might be positively connected with the acceptability of road pricing, while pursuing personal and gain maximising aims could lead to a refusal of road pricing, and that because of a threatening restriction of personally important aims.

2.2.3 Information

From environmental awareness research it is known, that knowledge about the right action is a necessary but not sufficient precondition for conservation-conscious behaviour (e.g. Bell et al., 1990; Schahn, 1993). So, any new measure that is to change the demand for traffic depends on a good user information. Among other things, the background of the problem as well as the aims of the measure, and the concrete realisation have to be clear (Schlag, 1998). Although this causal connection could not be settled yet, investigations show that well-known demand management measures meet with a higher rate of acceptability than unknown measures (Franzen, 1997; MIRO, 1995; Keränen, Schade, Schlag & Vougioukas, 1999; Schlag & Schade, 2000). It is usually assumed, that a higher effectiveness evaluation depends on how known the measure is and that this effectiveness-judgement also has an influence on the acceptability. But findings are inconsistent. Steg & Vlek (1997) found information having a negative effect, in such way that a lot of information led to a higher assessment of the effectiveness but, compared with a less informed control group, to a significant lower acceptability of restrictive measures.

From a psychological viewpoint, the level of relevant knowledge has a specific function for attitudes towards a particular object such as road pricing. Compared with uninformed people, informed people are more aware of the advantages and disadvantages of road pricing. They are aware of the problems associated with it and how they are affected by them. In this case, psychologists speak of secondary control: even if you cannot influence your environment (the decision on whether or not road pricing is introduced), and if you have a sufficient level of knowledge, you can at least come to terms with what is happening and 'make the best of a situation'. In this case, people can at least control the personal consequences of the things which are actually beyond their own control.

In psychological terms, a distinction must be made between whether a person feels well or badly informed or whether he is actually well or badly informed. Hence, in our study, a differentiation is made between so-called *objective* knowledge and the *subjective* assessment of the own knowledge.

2.2.4 Perceived Effectiveness and Efficiency

If someone has realised traffic problems and their consequences (problem perception), and has identified at least in part the aims of changing these problems (reducing traffic congestion, declining environmental damage etc.), he has to answer the crucial question, whether the proposed measures are of appropriate effectiveness and efficiency. *Effectiveness* refers to the degree to which the aims of the measure can be reached. *Efficiency*, on the other hand, means the cost-benefit-relation of a concrete measure (e.g. road pricing) compared to other possible measures (e.g. access restriction). Because the efficiency criterion - due to its complexity - is difficult to investigate or to communicate, up to now mostly perceived effectiveness has been examined (Keränen et al., 1999; MIRO, 1995; Steg & Vlek, 1997). The findings are not surprising: A lower degree of reaching aims (e.g. to reduce traffic congestion) is ascribed to road pricing than to restrictive measures, like closing inner city for car traffic, or to measures which improve public transport (Luk & Chung, 1997; MIRO, 1995). Here, lower scores in the perceived effectiveness usually go along with a lower acceptability of the certain measure and vice versa. But facts defining the direction of this relationship are missing so far (cf. Bartley, 1995). Rienstra et al. (1999, 190) mention 'that strategic responses on perceived effectiveness may occur when respondents try to justify their rejection of painful policy by claiming that they perceive them as ineffective'.

2.2.5 Equity

In the discussion about introducing road pricing measures often arguments arise, which doubt the equity or fairness of such a system (Teubel, 1997). Here, equity first of all is referred to the distribution of costs and benefits (Giuliano, 1994). From a psychological point of view perceived justice - among others - is of major concern as a basic requirement for acceptability. Justice, as people perceive it, may differ from objective distribution of costs and benefits but surely depends on it as one major parameter influencing personal perceptions. And, as with most personally mediated perceptions, it differs not only between different situations (intraindividual variance) but also between people in the same situation and even between people with comparable objective costs and benefits (interindividual variance). Therefore, besides rational cost-benefit-calculations additional variables which also influence the personal cost-benefit-ratio, must be taken into account (see fig. 2.2-1).

In social psychology as well as in sociology and in law is distinguished between:

a) *Distributive Justice and Procedural Justice:*

Whereas the term *procedural justice* is attempted to define principles of a just procedure or policy how to come to just solutions (or at least solutions not

leading to new or heavy conflicts), *distributive justice* is related to the outcome of these procedures. One should bear in mind that procedural justice is a necessary prerequisite when introducing new structures or new ideas with distributional impacts in society. Sometimes perceived procedural justice may even help to accept a solution which puts some burden on people because they accepted the way to come to this end. What is perceived as a just procedure may differ in different countries (e.g. Leung & Lind, 1986). But at least in democratic societies with a big influence of mass media, one determinant of perceived procedural justice seems to be an open discussion with an early participation of all people concerned. Otherwise reactance will become probable even hindering a rational discussion afterwards. Perceived procedural justice is strongly related with the people's perception of being treated fair and of having at least a chance to influence the outcome, themselves.

b) Within distributive justice we distinguish 3 main principles of a just distribution which under certain circumstances all can be perceived as just:

- (i) *Equality*: everyone gets the same share ('one man – one vote');
- (ii) *Equity*: everyone gets an output (or benefit) reflecting his input (or contribution or costs);
- (iii) *Needs or requirements*: everyone gets a share according to his needs or requirements.

Each of these principles may be just and perceived as just under different conditions.

Equality is mostly perceived as just in social relations stressing solidarity, similarity of members, common interests, e.g. in a good partnership or, more general, in basic human rights. An *egalitarian distribution* also starts with an equal treatment of all human beings but then adds the idea that unevenness in a distribution should give more benefits to the less advantaged.

The needs or requirements principle sometimes is guiding distributions (and then is perceived as just) where care and welfare are the most important aims, e.g. in families or with respect to people in social care. In societies it is mostly applied to guarantee some basic supply or subsistence.

Equity as distributional principle is generally preferred in economic relations or relations where an exchange of products or contributions is the main concern. This principle has become dominant in industrialised societies, and some argue that educating people to believe in equity as the predominant principle of distributional justice was of great relevance in growing performance-oriented societies. In developmental psychology children's belief that they get what they deserve and that they are not treated unjust (Lerner, 1975) must develop before they orientate towards a further reaching personal future and before they will be able to accept delay of gratification. In social psychology the equity theory (e.g. Adams, 1965; Walster, Walster &

Berscheid, 1978) is seen as a motivational theory, i.e. motivating people to maintain equity and to avoid inequity. Perceived inequity may lead to feelings of guilt (if favoured) or, above all, of anger (if others are perceived as favoured) which in turn often leads to reactance (Brehm, 1966).

Nowadays most of the attempts to reach distributional justice start with the idea of equity – except e.g. the purely utilitarian approach according to which justice is done when the amount of utility is maximised regardless of its distribution. In the final report of SPARTACUS (1998) some additional ideas of justice are discussed, most of them combining utilitarian ideas with some of the basic principles above. The ‘maximisation of average net benefits with a minimum floor benefit’ again contains the idea that besides the objective of benefit maximisation notably the less well-off should receive a minimum amount. And the ‘maximisation of average net benefits with a benefit range’ puts some constraints to the widening of the differences in the welfare, above all, between groups with higher and lower income.

One of the most sophisticated theories of justice stems from John Rawls (1972). He postulates on the basis of (simplified) a) equal basic liberties and b) offices and positions open to all, social and economic inequalities should be c) to the greatest benefit of the least advantaged (the ‘difference principle’).

In AFFORD we are aiming at an operationalisation of Rawls’ difference principle starting with equity considerations (and not with equality as Rawls does).

c) The *perception of equity* has its basis in the *comparison* of at least 3 *different parameters*:

- (i) An *intrapersonal* level of comparison refers to the personal input-output-ratio before and after the treatment or the measure has been introduced. Am I better off or worse afterwards? Here the intrapersonal level will be called ‘personal outcome expectations’. This is a first approximation to perceived equity, assuming that people have their (mostly social) points of reference for comparison and evaluation. The advantage of using this simple variable is that – as pre-tests have shown – all other definitions of equity are rather difficult to communicate in a standardised questionnaire.
- (ii) Second the *interpersonal* comparison can be characterised as: Compared to relevant others what is my relative personal input-output-ratio before and after the introduction of the measure? Equity in this sense is most prominent in social psychology and refers to interactive balance: own output/own input = others’ output/others’ input?
- (iii) Third, people reflect their *comparison level for alternatives* (Festinger, 1954): Have I alternatives (or am I simply forced to pay now for something which was free before)? Are the alternatives more attractive and more salient then before? Is it possible to engage in some kind of

smart behaviour compensating for perceived disadvantages (perhaps compensating is for me even better than for relevant others)?

All these reference points for comparisons and for evaluating personal outcomes on an equity basis are not independent of each other. Moreover, people are often not aware of the causes and motives of their decisions and feelings, but nevertheless they look very thoroughly how they are treated before and after the introduction of the measure, in comparison to others, and with respect to alternatives.

2.2.6 Social Norms, Perceived Behavioural Control and Intentions

The three concepts social norms, perceived behavioural control and intentions are derived from Ajzen's Theory of Planned Behaviour (Ajzen, 1991), which extends the theory of reasoned action (Fishbein & Ajzen, 1975). The Theory of Planned Behavior (TOPB) is a social-psychology theory dealing with the relation between attitudes and behaviour.

The TOPB states that an individual's behaviour can be best predicted by his intention to exhibit this behaviour. The intention in turn is influenced by three variables: the attitude towards the behaviour, the subjective norm and the perceived behavioural control. The latter can also directly influence behaviour. The extent to which the respective variables have an effect on the intention or behaviour varies between different situations and between different persons. Also, attitude, subjective norm and perceived behavioural control influence one another reciprocally. In terms of the TOPB the three variables are defined as follows:

- "Attitude" towards a specific behaviour in a specific situation is defined as the added products between expected behavioural consequences and the subjective valuations of these consequences.
- "Subjective Norm" is the perceived social pressure, that is: perceived opinions of others multiplied with the importance of the others' opinions for the individual. In more detail the subjective (or social) norm means the respondent's assumption about whether their closest (family, friends) would think that they should accept the strategy. These normative beliefs are concerned with the likelihood that important referent individuals or groups approve of performing a given behaviour. The hypothesis is, the more favourable the subjective norm is with respect to a presented pricing strategy, the stronger should be an individual's acceptability of the strategy.
- "Perceived behavioural control" is considered as the ease or difficulty for the person to exhibit a specific behaviour in a certain situation. This means, that the more resources and opportunities individuals believe they possess, and the fewer obstacles or impediments they anticipate, the greater should be their

perceived control over the behaviour. Perceived behavioural control may, but need not, be the same as actual behavioural control.

2.2.7 Attribution of Responsibility

The construct of responsibility attribution stems from the norm activation theory by Schwarz (1970) and represents a central component for explaining altruistic behaviour. In the last years this model has been used in studies which attempt to explain environmental behaviour (Homburg & Matthies, 1998). It is assumed, that environment- preserving behaviour becomes more likely if persons perceive damaging consequences of their own acting on the environment and on others, and at the same time ascribe the responsibility for the consequences to their own person. In the context of acceptability of road pricing, ascription or attribution of responsibility appears to be a precondition for perceiving problems caused by traffic (problem awareness). It may be distinguished between the (attribution of) responsibility for problem causation on the one hand and the responsibility for problem solving on the other hand. It is also in question, whom the responsibility to solve the problems is attributed to. On the one hand it can be ascribed to the own person, i.e. internal. But responsibility may also be attributed externally (e.g. to the state). If the own person is considered as at least partly responsible to solve the problems, this should lead to increased agreement with measures that raise the price of or restrict the use of car. But if only external instances are regarded as responsible for the solution of the traffic problems, a negative effect on the support of road pricing measures can be expected. Because a lot of traffic problems, like traffic congestion, often are integrated in a complex system of interdependent relations and effects, it is to be assumed, that responsibility attribution can be referred both to internal and external instances, which do not exclude each other. I.e. someone who feels his own responsibility, may indeed consider other (external) instances as responsible, too. Steg & Vlek (1997) report first results that show a positive connection between responsibility attribution, problem awareness and acceptability of demand management measures.

2.2.8 Socio-Economic Impacts

For the motorists road pricing as a management policy for traffic demand represents a distinct change of the financial situation regarding mobility. Persons who are not willing to adapt their mobility behaviour to the respective road pricing structure have to reckon with an additional financial burden. But also in general an increase in price for car traffic is to be expected. It may be assumed that acceptability of road pricing depends on the socio-economic status of the people. Following the economic theory, it is to be expected that low income groups should oppose road pricing more often because of their higher marginal utility of money, and their decreased willingness to pay to reduce externalities

(Rienstra et al., 1999). Conversely, road pricing is supposed to receive more support from higher income groups because their value of time is higher and their marginal value of income generally is lower. In general it is assumed that the advantages of road pricing will mainly be of benefit for the better-off (Commission of the European Communities, 1995). Thus, for them higher acceptability-levels are to be expected.

Strikingly, in their empirical analysis Rienstra et al. (1999) found that the lowest income group perceived pricing measures as most effective, and also, that the income level had no significant impact on the support for pricing measures. Further, they examined the relation between other socio-economic variables and model variables like 'problem awareness', 'perceived effectiveness' and 'support of policies'. They summarised 'that the support for policy measures is influenced to a lesser extent by the personal features of respondents' (Rienstra et al., 1999, p. 198).

All in all, there are only few hypotheses regarding the socio-economic effects on the acceptability of road pricing. Also, one has to keep in mind that there are further steps and possible gaps between attitudes and revealed behaviour. The acceptability model was developed to describe the conditions and requisites of public acceptability. However, with extensions and modifications it may also valid for political acceptability. These will be mentioned in the respective section.

2.3 Experience from an Existing Pricing System: The Oslo Toll Ring⁵

In the mid-eighties, the city of Oslo was confronted with unsatisfactory traffic flow with significant delays for all. Besides, there were local environmental problems with traffic hold ups and pressure on local streets and residential roads. The public funds for road construction were insufficient. To allow the financing of a road investment program, authorities decided to seek the required additional resources from users. The toll ring was to contribute to the implementation of different projects within 15 years, as opposed to 35 years financed by public grants.

Through the first part of the eighties there was an excited discussion. Different ways of payment were considered like petrol tax, a local toll ring for the Oslo tunnel, increased parking fees and an area based road tax. Two different motives were proposed:

- (i) To provide money for constructing roads and other transport infrastructure.
- (ii) To limit car traffic, completely or in rush hours only.

⁵ This section is based on a paper written by Gunnilla Ystrøm.

The political process towards implementation was difficult. Four years before the implementation, Oslo City Council and Akershus County Council passed a principle approval about tolls based on motivation 1. Two years later the toll ring passed the formal political approval. Just before that the Norwegian Parliament had changed the law. As a result of this law change, equivalent toll rings were also established in Bergen and Trondheim. After the principal political agreement followed a discussion about localisation. Here one had to combine fairness, maximum of income and practicability (e.g. available land to build toll stations). 210,000 of Oslo's inhabitants live outside the toll ring. In addition, approximately 200,000 of the region's remaining population frequently go to Oslo city centre. A discussion occurred of who would have to pay and who would not have to pay to go to the city centre.

The local majority consisted of the two largest political parties, the social democrats and the conservatives. Certain issues caused strong internal dissension. For example, a considerable group of young people within the labour party demanded that 30% of the revenues were to be allocated to public transport investments. The conservative party considered this breaking the initial agreement. This crisis was solved partly by a warning from the national authorities about a possible termination of national road and railway investments.

Two different factors made the agreement possible at last:

- (i) Opposite regards gave the same substantial solution. The supporters of road construction were satisfied by the official arguments, while those against road construction wanted the toll ring because it would make an opportunity to limit the number of cars into the city when it was established.
- (ii) Local disagreement checked by public financial pressure. Fear of losing national grants made municipal politicians willing to make a compromise.

Political and public acceptability of tolls

Norway has a long tradition of using road tolls as a way of financing road investments. It is politically accepted in all parties. Before the extensive toll systems were implemented in the cities, there were tolls on bridges and tunnels connecting the islands to the mainland. There is no general acceptability of road pricing as a demand management measure.

In general it has to be noted that attitudes before the implementation of the toll ring are based more on expectations and estimations rather than on real experiences with the system ('acceptability'). In contrast to the cross-sectioned stated acceptability the revealed behaviour after the introduction of the system ('acceptance') can be seen as a process of dealing with the adaptation to the new mobility situation.

In the year before the implementation of the toll ring, 70% of the city's population were negative towards the toll ring (see fig. 2.3-1). When the system had been operative for one year this opposition had been reduced to 64%. In 1998 this figure was 54%. The share being very negative has decreased from 40 to 17 percent during the same period. The share being positive to the toll system has steadily increased during the period, from 30 percent before the toll system opened to 46 percent in 1998.

The data show that public acceptance increases with successful implementation, thus showing, that it is possible to raise acceptance by implementing a carefully selected road pricing scheme.

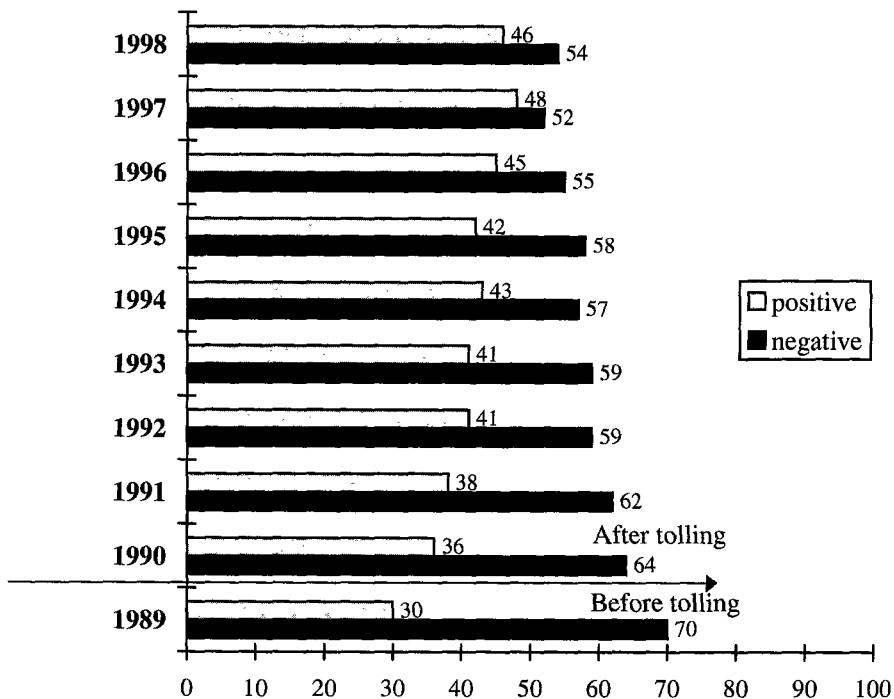


Figure 2.3-1: Development of attitudes towards the Oslo toll ring (Norwegian Public Roads Administration et al. 1999, 9).

3 Public Acceptability

3.1 Introduction

An empirical survey on public acceptability of different pricing strategies, carried out in the four European cities of Athens, Como, Dresden and Oslo, formed the integral part of this study. Here, two questions were to the fore:

- (i) How high is the current acceptability level of various pricing strategies?
- (ii) Which factors influence the degree of acceptability?

In the following the method which this survey was based on will be described (section 3.2). Then, the pricing strategies, which were to be evaluated (section 3.3), and the examined sample (section 3.4) will be described. In sections 3.5 (site-specific results) and 3.6 (overall results) mainly the present acceptability level for the different pricing strategies shall be reported. In section 3.7 the question about which factors influence the degree of acceptability will be dealt with, using multivariate statistical methods. Finally, against the background of the theoretical considerations as outlined in section 2, the results shall be discussed (section 3.8).

3.2 Survey Method

The purpose of the present study is to perform an analysis of the social and psychological factors (predictors) affecting attitudes towards and acceptability of marginal cost based pricing strategies. Identification of these factors enables the development of policies to overcome the barriers to the implementation of these systems. The questionnaire which was used in the AFFORD public acceptability survey reflects, above all, the different variables outlined in the acceptability model (fig. 2.2-1). Earlier experiences with questionnaires in the EU-projects MIRO (Vierth & Göthlin, 1995) and TransPrice (Keränen et al., 1999) have been integrated. For a more detailed description of the background of the questionnaire see Schade (1999). Most of the variables are operationalised by a four-graded scale with the exception of the variable equity which is three-graded. The questionnaire is added in the in the appendix. Only closed questions were used.

Table 3.2-1: Example for a used four-graded scale.

How effective do you think this strategy will be in reducing the amount of traffic in the city centre of Athens?			
will work very effectively	will have some effect	will have little effect	will not work at all
○	○	○	○

Sampling method

The sample consisted of *motorists* exclusively. A quota sampling was used considering demographic criteria with regard to age, gender, occupation and place of residence. The selection of the respondents was random corresponding to the quota. In each of the four cities, the samples were drawn from the local telephone directory. The subjects were contacted by phone and asked whether they are in possession of a valid driving licence for private vehicles and willing to take part in the survey. If this was the case, a questionnaire was sent to the respondents. After they had filled them in, the respondents were invited to resend the questionnaires (by free mail). The surveys were carried out from December 1998 to January 1999. Due to the local specific conditions the procedures for selecting the sample in the four different cities differed slightly. In Athens, Como and Dresden the surveys were conducted by the local AFFORD partner. In Oslo the survey was carried out by the Norwegian Gallup Institute. There, motorists were selected with the first upcoming birthday in the household. After 400 people were contacted who were willing to participate the survey was stopped. 285 respondents returned the questionnaire in Oslo. In Athens personal interviews were carried out for cultural reasons. The total sample of the four cities (Athens, Como, Dresden, Oslo) is not representative.

3.3 The Marginal Cost Based Pricing Strategies

In the following the pricing strategies (policy packages) which were used in the public and political acceptability surveys are presented. The strategies had been developed within AFFORD Deliverable 1 (see for a detailed explanation Milne, Niskanen & Verhoef, 2000, 76-77), where the economic rationale for designing marginal cost based policy packaging, the general categories of policy packages and also examples of actual packages are given and discussed. Two packages (strategy A and B) were applied in all cities whereas the site specific strategy allows for local circumstances (each site specific strategy is explained in section 3.5.1 - 3.5.4):

- (A) 'best practice second best' the so-called '*strong*' package,
- (B) 'acceptable', the so-called '*weak*' package,
- (C) site specific strategy (see section 3.5.1 - 3.5.4).

There were minor differences in the packages between Oslo and the other cities. This is due to the current toll ring in Oslo.

Athens, Como, Dresden**'Best practice second best' - Strategy A**

Charge motorists

- toll cordon with charges of 2 euro during the morning peak (7.00 - 9.00 a.m.) and 0.5 euro thereafter
- parking charges increased with 0.5 euro/hr
- fuel taxes increased with 0.5 euro/litre

and use the revenues:

- two thirds to lower labour taxes
- one third to invest in capacity expansion of known road traffic bottlenecks

'Acceptable' - Strategy B

Charge motorists

- toll cordon charges of 1 euro at all times (including nights and weekends)
- parking charges increased with 0.25 euro/hr
- fuel taxes increased with 0.125 euro/litre

and use the revenues:

- one third to lower fixed vehicle taxes
- one third to invest in capacity expansion of known road traffic bottlenecks and/or to improve parking facilities
- one third to improve the quality of public transport

Oslo**'Best practice second best' - Strategy A**

Motorists pay

- NOK 16 to pass in the toll ring during the morning peak (7.00 - 9.00 a.m. Monday to Friday) and NOK 4 at other times (without access to monthly or (semi)annual passes)
- an additional NOK 4 per hour for parking
- an additional NOK 4 per litre of fuel (petrol or diesel)

and use the revenues:

- two thirds to lower the income tax in Oslo
- one third to enhance capacity at known road traffic bottlenecks

'Acceptable' - Strategy B

Motorists pay

- toll cordon charges of NOK 8 per passenger at all times (i.e., less than today, but with no access to monthly or (semi)annual passes)
- an additional NOK 2 per hour for parking
- an additional NOK 1 per litre fuel (petrol or diesel)

and use the revenues:

- one third to lower the annual vehicle tax in Oslo
- one third to enhance capacity at known road traffic bottlenecks and/or to improve parking facilities
- one third to improve public transport

3.4 Sample Description

The whole AFFORD sample contains 952 persons interviewed (tab. 3.4-1).

Table 3.4-1: Sample sizes.

	Total	Athens	Como	Dresden	Oslo
sample size	952	150	238	281	285
female	38.1%	38.3%	35.1%	35.5%	43.1%
male	61.9%	61.7%	64.9%	64.5%	56.9%
mean age (years)	44.3	36.5	45.6	45.4	46.3

The sex distribution of the sample reflects in good approximation the ratio of active car drivers of women and men (but not their respective population share). The mean age is 44.3 years by a standard deviation of 14.58 years. The yearly kilometrage is 14,663 km on average. The next figure shows the distribution of age groups in the four cities (fig. 3.4-1).

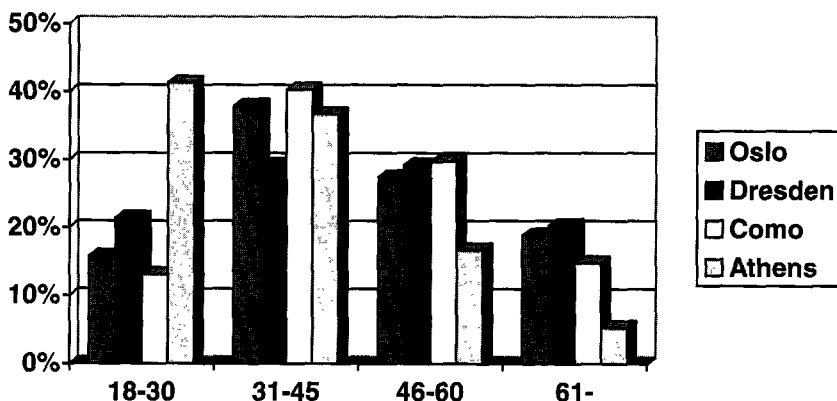


Figure 3.4-1: Age distribution in %.

The median of the income distribution is 4 (2,001-3,000 euro).

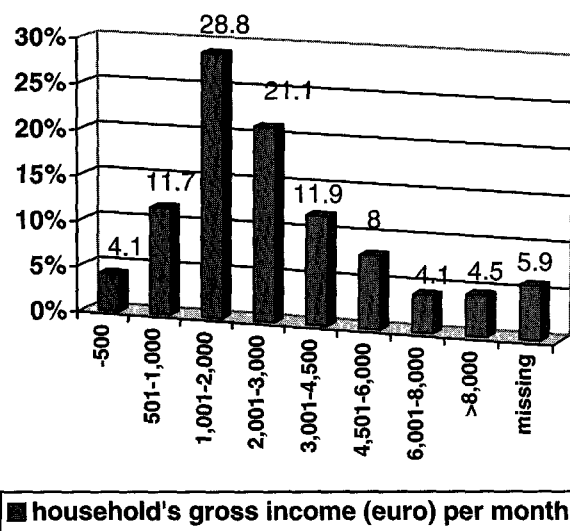


Figure 3.4-2: Household's gross income (euro) in %.

Tables 3.4-2, 3.4-3 and 3.4-4 show the household size, the number of persons under 17 per household and the employment status of the respondents.

Table 3.4-2: Household size.

persons	1	2	3	4	5	more than 5
(%)	11.3	30.7	23.7	25.3	5.7	1.3

Table 3.4-3: Number of persons under 17 per household.

persons <17	0	1	2	3	more than 3
%	60.7	19.5	15.8	2.7	1.2

Table 3.4-4: Employment status.

	%
self employed	12.8
employed (full time)	52.8
employed (part time)	4.4
student, trainee etc.	6.2
unemployed	2.6
pensioner	14.6
homemaker	2.6
other	1.6
missing	2.3

The following question refers to the main mode of transport the respondent normally use to go to work/school (tab. 3.4-5). More than two thirds of the interviewees go mainly by car to work/school. However, 32.8% of the respondents use mainly other modes than car.

Table 3.4-5: Usual moving modus to work.

	car	public transport	bicycle	walk
%	67.1	20.9	6.3	5.6

3.5 Site-Specific Results

In this section the descriptive results are shown separately for the different sites. The presentation follows the theoretical considerations outlined in section 2. First, frequency distributions and mean values of the variables regarding the traffic situation in general are reported (problem perception, attribution of responsibility etc.). Then, the variables which are directly connected with the pricing packages (information, perceived effectiveness, personal outcome expectations, acceptability and intentions) are presented for each strategy. First for strategy A (best practice second best), then for strategy B (acceptable) and finally for the site specific strategy. Afterwards, in section 3.6 the overall results are presented.

3.5.1 Athens

The traffic problems of Athens have been considered as serious since the early 1960's, when the first major traffic and transportation study was carried out in the metropolitan area. However, it was not until the early 1980's when traffic restrictions were implemented. This was primarily in response to acute air pollution (smog) problems, which were largely attributed to car traffic.

The Athens sample is the smallest (N=150) and youngest of the AFFORD samples. The median of the income distribution is below the median of the total sample. Compared to the other cities, there is the highest share of public transport users (for trips to work) in Athens.

Two questions deal with the perception of problems caused by traffic. The first question concerns the perception of problems as *general* problems for the society as a whole. The second question concerns the perception if transport problems affect the respondents themselves, i.e. the personal *affectedness* by the problem. Six problems had to be evaluated: traffic congestion, not enough parking space, inadequate public transport, air pollution from motor vehicles, traffic noise, and unsafe roads. The general problem perception is very high and overall the highest of all surveyed sites. On a scale of 1 to 4 the average rating of the six problems as

a societal problem in general is at 3.48 ($\pm .45$ standard deviation). This value is only a little bit lower than found in the TransPrice acceptability survey (3.79) which was carried out 1998 (Keränen et al., 1999). The most pressing problem was traffic congestion followed by air pollution from motor vehicles. But all other items were seen at least as a major problem (see fig. 3.5-1).

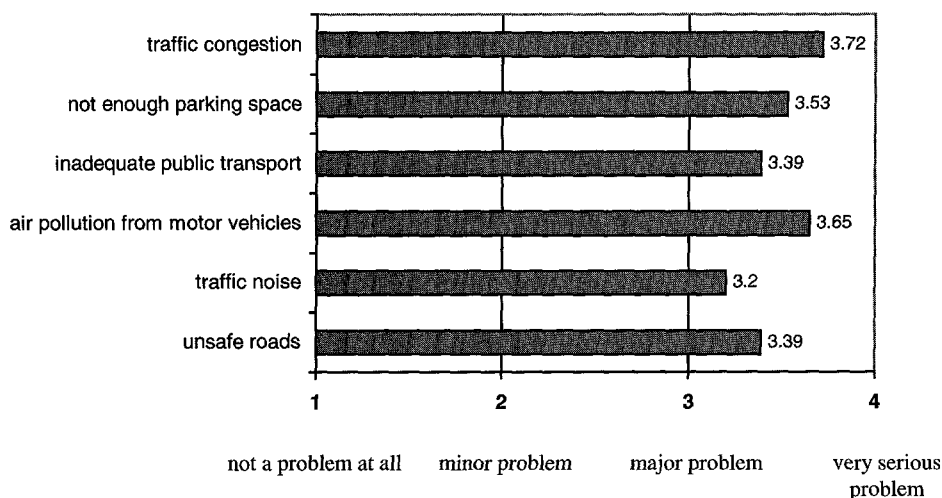


Figure 3.5-1: General Problem perception: Mean values.

The next question refers to the perception in which way transport problems affect the respondents themselves (tab. 3.5-1). Almost all of the respondents feel personally affected by congestion, air pollution, not enough parking space and unsafe roads. There seems to be no difference between the general and the personal problem perception in the Athens sample. Both are ranked extremely high.

Table 3.5-1: Personal problem perception (affectedness; in %).

	% who feel personally affected by
traffic congestion	97.3
not enough parking space	85.3
inadequate public transport	68.7
air pollution	88.0
noise	70.7
unsafe roads	84.0

The negative perception of current transport problems continues for the expectation regarding the development of the situation (tab. 3.5-2). In general, this expectation tends to be negative. Except for inadequate public transport and

unsafe roads the majority of the respondents expect the problems to deteriorate over the next five years.

Table 3.5-2: Problem expectation (in %).

	getting worse	stay the same	getting better
traffic congestion	83.3	15.3	1.3
not enough parking space	75.3	20.7	4.0
inadequate public transport	42.7	47.3	10.0
air pollution	61.3	28.0	10.7
noise	56.7	38.7	4.7
unsafe roads	40.9	48.3	10.7

In general, the persons interviewed are not certain about who should be responsible for the solution of transport problems (see fig. 3.5-2). Some responsibility is attributed to the automobile associations and the public transport companies and also to the municipality. The term automobile associations in the context of the Greek survey not only refers to automobile clubs but also to association of professional drivers such as taxi and truck drivers.

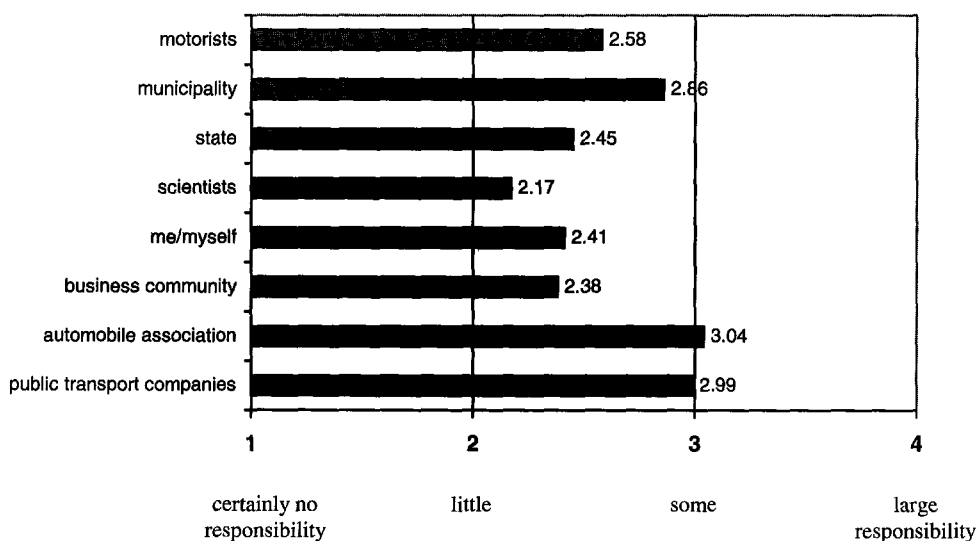


Figure 3.5-2: Attribution of responsibility for the solution of perceived problems (mean)

Surprisingly, almost all of the respondents indicated that car traffic should be limited (tab. 3.5-3). However, this question does not consider how to obtain this reduction.

Table 3.5-3: A need to limit the traffic? (in %).

no, not at all	not really	to some extent	certainly
.7	8.8	37.8	52.7

The next question deals with the perceived (subjective) dependency on car use (see section 2.2.6). The perceived behavioural control refers to people's perception of the ease or difficulty of performing the behaviour of interest (here: to reduce personal car trips). The perceived control can be different from objective control. E.g. in many cases motorists think that they would have no opportunity to use public transport. In fact, often there is possibility to use public transport, but the motorists are not informed about it. In the current case the hypothesis is, that people who see an opportunity to reduce car use would accept pricing strategies more easily. As reported in tab. 3.5-4 more than half of the Athens respondents consider it difficult to reduce car trips substantially.

Table 3.5-4: Perceived difficulty to reduce car trips substantially (in %).

not at all difficult	rather not difficult	rather difficult	very difficult
11.3	34.0	44.7	10.0

Figure 3.5-3 shows to what extent the respondents expect personal trips being affected in the case of road pricing. In general the participants of the Athens sample do not expect considerable changes in their leisure, shopping or work trips. Only to some extent the interviewees are willing to reduce shopping and leisure trips. However, this could be also an indicator that shopping trips may be directed to other shopping places outside the pricing area.

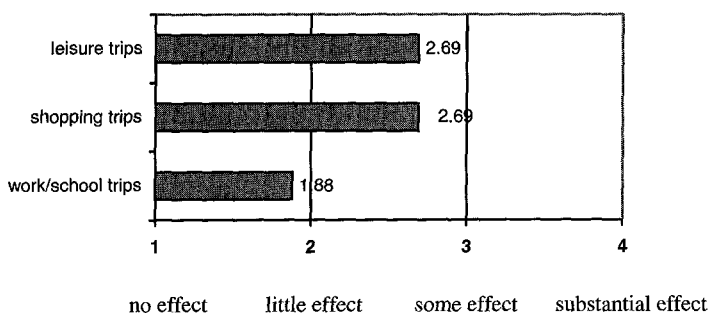


Figure 3.5-3: Self-reported price elasticity (mean).

The answer to the question whether car driving will become more expensive in the future serves as background information about general cost expectations

related to car use (tab. 3.5-5). More than 90% of the Athens interviewees expect an increase in car-related costs.

Table 3.5-5: Will car driving become more expensive? (in %).

no, not at all	probably no	probably yes	almost certainly yes
	9.3	60.7	30.0

In the following the results of the evaluation of the proposed AFFORD strategies is presented (see section 3.2 for a detailed description of the strategies).

Evaluation of Strategy A 'Best practice second-best'

Strategy A is the strong package. It contains the highest charges compared to the other strategies. Furthermore the use of revenues focuses mainly on a reduction of labour taxes.

It is not surprising that one half of the respondents indicate that they know nothing at all about strategy A (tab. 3.5-6). However, the other half stated to know at least little about the strategy. This is an indicator that pricing strategies in general are not completely unknown to the persons interviewed in Athens.

Table 3.5-6: Information about strategy A (in %).

nothing at all	little	somewhat	a lot
51.3	28.0	19.3	1.3

The evaluation of the effectiveness plays a major role in the acceptability model. It is hypothesised that the higher the perceived effectiveness of a problem solving measure is, the more attractive and therefore accepted will it become (e.g. Rienstra et al., 1999; Schlag, 1997). The rates of the effectiveness-evaluation in the case of the Athens sample are well balanced (tab. 3.5-7). As a whole the respondents are not completely sure about the effects of strategy A, only 15% respectively rate the strategy as absolutely ineffective or absolutely effective.

Table 3.5-7: Perceived effectiveness of strategy A (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
15.4	32.9	36.9	14.8

From a psychological point of view *perceived* justice is, among others, of major concern as a basic requirement for acceptability. The hypothesis here is, that the more the people expect advantages for themselves the more they are willing to accept the measure.

Table 3.5-8: Personal outcome expectation in general (in %).

disadvantage	no importance to me	advantage
28.7	35.3	36.0

As it can be seen from table 3.5-8, around one third of the respondents would expect advantages in the case of strategy A. The analysis does not reveal any differences between the three groups of respondents in socio-economic characteristics. Compared with the TransPrice public acceptability survey in Athens there is a considerable increase in the expectation of personal disadvantages. This could be due to the fact that in AFFORD more detailed packages were presented. This relates in particular to the proposed charges which make the packages more realistic and imaginable. In TransPrice, in the contrary, only general measures like road pricing were presented without outlining concrete prices. This could have led to a misconception about the personal consequences of the scheme.

Table 3.5-9 shows the distribution of the directly measured acceptability of strategy A. Only 2.7% of the respondents would accept strategy A totally, 22% would at least to some extent accept the measure. As a whole strategy A is rejected by the vast majority of the people interviewed in Athens. However, rejection is not as strong as in the 1998 TransPrice acceptability survey where up to 48% of the respondents rated isolated pricing strategies (without considering revenue usage) as absolutely unacceptable. This could be due to the fact that the AFFORD strategy A also indicates a way of revenue allocation.

Table 3.5-9: Acceptability of strategy A (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
31.3	44.0	22.0	2.7

The subjective (or social) norm as presented in table 3.5-10 refers to the respondents' assumption about whether their closest (family, friends) would think that they should accept the strategy (see section 2.2.6). This social factor refers to the perceived social pressure. As a general rule, the more favourable the subjective norm with respect to the presented pricing strategy, the stronger should be an individuals acceptability of the strategy. Thus, the social norm as an explaining predictor variable is important (see section 3.7). However, the descriptive results (frequencies) of this variable can be neglected and shall be reported only once (only for Athens, for strategy A).

Table 3.5-10: Social norm of strategy A (in %).

very unlikely	rather unlikely	rather likely	very likely
20.7	39.3	34.7	5.3

Which kind of behaviour do people intend to show in the case road pricing is introduced (here: strategy A)? Do people intend to behave in according⁶ with the measure? But what is supposed to be the right behaviour? This cannot be defined in each case. However, expressed intentions, as found here, are an indicator of what could happen after the introduction of a measure, at least to some extent. Tentatively the opportunities to respond to the measure can be divided into two subgroups, whose differentiation will be examined statistically in section 3.7.1. The first group of intentions (from 'drive less' up to 'use park & ride', see table 3.5-11) can be characterised as intentions to reduce car use and/or to switch to other modes. The second group can be described as intentions to maintain current car use, at least in a modified manner (only changes in routes or times but not in the total amount⁷).

Table 3.5-11: Expressed intentions in the case of strategy A is introduced (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	12.7	28.7	34.0	24.0
use public transport more often	12.7	22.7	31.3	33.3
use my bicycle or walk more often	22.8	29.5	24.2	23.5
take part in car-sharing or car-pooling	18.0	33.3	40.0	8.7
use park & ride more often	10.0	14.7	37.3	38.0
pay the tolls and drive as before	20.8	36.9	33.6	8.7
not drive tolled routes	14.0	22.0	37.3	26.7
not drive at tolled times	16.8	24.8	37.6	20.8
support a movement to stop the strategy	32.0	29.3	23.3	15.3

In Athens, there generally seems to be a willingness to adapt behaviour to the new mobility situation. There is the intention to reduce car traffic as well as the intention to modify car use. A majority of the respondents would use park & ride more often, drive less etc. In particular park & ride appears to be an alternative possibility to paying the tolls for the respondents of the Athens sample. This is confirmed by real life demonstrations in the TransPrice study (in prep.). There the Athens results of the road use pricing trial indicated that 25% of car users transferred to park & ride. The report (TransPrice, in prep., 8) follows that 'these results suggest that, on a network-wide basis, up to 15% of car drivers could transfer to park & ride with a 5:1 pricing regime in favour of Park & Ride'. Also, these results can be taken at least tentatively as some form of validation for the present questionnaire. The respondents are not sure about the possibility to take part in car sharing. This applies also for the maintenance of car use. The persons interviewed would intend to drive uncharged routes or drive less at tolled times.

⁶ In this case one would have to define some kind of 'optimal' behaviour.

⁷ Changes in route and time of car use are often main objectives of road pricing.

The majority of the respondents is not willing to pay the tolls. Around one third of the persons asked intend to support a movement to stop the strategy.

Thus it could be concluded tentatively, that even when the strategy described seems rather unacceptable at an attitudinal response level, people nevertheless mostly form intentions to behave in according with the strategy. Only a minority intends to show concrete reactance or resistance against the system once it is implemented.

Evaluation of Strategy B 'Acceptable'

Strategy B is the so-called 'acceptable' package. This is due to the fact that the charges are reduced about 50% and the revenues are allocated in the traffic sector exclusively. The distribution of answers concerning the information or knowledge about strategy B does not differ substantially from that of strategy A (see tab. 3.5-12). Around one half of the Athens respondents believe they know at least a little about strategy B.

Table 3.5-12: Information about strategy B (in %).

nothing at all	little	somewhat	a lot
53.3	26.7	18.0	2.0

The evaluation of the effectiveness of strategy B is rather positive (tab. 3.5-13). Although less respondents are convinced about the absolute effectiveness, 50.7% of those interviewed expect strategy B to have some effect.

Table 3.5-13: Perceived effectiveness of strategy B (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
12.0	28.7	50.7	8.7

Strategy B modifies the respondents' personal outcome expectations considerably (tab.3.5-14). In the case of strategy B more than 50% of interviewed would expect personal advantages. Statistical analysis reveals that, both, people who expect disadvantages and people who do not expect differences in the case of strategy A change their mind and come to a more positive evaluation for strategy B.

Table 3.5-14: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
21.3	26.7	52.0

The results for the directly measured acceptability of strategy B reveals that around 43% of the respondents would (rather) accept strategy B (tab.3.5-15).

Table 3.5-15: Acceptability of strategy B (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
14.7	42.7	41.3	1.3

This is a noticeable increase in support as compared to the acceptability of strategy A, but in general the support can only be seen as moderate. However, strong opposition has decreased substantially.

Concerning the intentions generated by strategy B there is no major difference to the intentions generated by strategy A. It seems that the respondents do not differentiate between these two rather abstract pricing strategies concerning the intentions what to do.

Table 3.5-16: Expressed intentions in the case of strategy B (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	10.7	31.3	34.0	24.0
use public transport more often	7.3	27.3	34.0	31.3
use my bicycle or walk more often	18.7	27.3	30.0	23.3
take part in car-sharing or car-pooling	18.7	34.0	38.0	9.3
use park & ride more often	7.3	12.7	37.3	42.7
pay the tolls and drive as before	18.1	36.9	34.9	9.4
not drive tolled routes	12.0	27.3	38.0	22.0
support a movement to stop the strategy	27.3	34.0	22.7	16.0

Athens Site Specific Strategy

In the following the results for the Athens site specific strategy are presented. This strategy was used only in Athens and includes local conditions and circumstances. The rationale for the strategy see below is based on the fact that the city of Athens has two cordons within its urban area: i) an external cordon and ii) an internal cordon. Since congestion is very pronounced, the proposed strategy C is planned to be implemented in both cordons and in morning and afternoon peak hours.

Table 3.5-17: Site specific strategy.

<p>Charge Motorists</p> <ul style="list-style-type: none"> • Toll of 1 euro for outbound cordon during 07:00-11:00 and 17:00-20:00, • Toll of 2 euro for inbound cordon during 07:00-11:00 and 17:00-20:00, • Parking fees increased 0.25 euro/hr, <p>and use the revenues:</p> <ul style="list-style-type: none"> • To half for investing in capacity expansion of known road traffic bottlenecks and to improve parking facilities, and • To half for improving the public transport service

Because of different external costs the tolls to be charged differ between the two cordons, i.e. the toll for the inner cordon is higher. The proposed increase in the parking fees is not very high (0.25 euro). The proposed pricing strategy is complemented with an improvement of: i) the service of the public transport and ii) available infrastructure facilities e.g. parking facilities.

In the survey conducted the majority of Athens respondents stated to be totally unfamiliar with the site specific strategy for their city (tab. 3.5-18). Around 40% indicated to know at least little about this strategy. Therefore it is the least known pricing strategy to the Athens respondents. This was a rather expected result since similar measures had not been implemented in Athens or in any other city in Greece before.

Table 3.5-18: Awareness of site specific strategy (in %).

nothing at all	little	somewhat	a lot
58.4	26.2	14.8	.7

As shown in tab 3.5-19 the Athens-specific strategy is considered as rather effective. More than 60% of the people interviewed believe that this strategy will have at least some effect. In the contrary to strategy B, which to about the same extent is evaluated as at least having some effect, more persons are convinced about the absolute effectiveness of the site specific strategy.

Table 3.5-19: Perceived effectiveness of site specific strategy (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
20.1	19.5	45.6	14.8

Still, compared to strategy B there is a considerable decrease in the expectation of advantages from the site specific strategy (tab. 3.5-20). A third of the Athens respondents expects personal disadvantages following from this strategy, and only a few people more expect advantages. Thus, of all three strategies the site specific strategy receives the most negative outcome evaluation.

Table 3.5-20: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
34.0	28.0	38.0

The acceptability results for the site specific strategy are comparable to the results for strategy A. They reveal a strong rejection of the strategy. Only 2.7% of the respondents would accept the site specific strategy totally, a fourth would rather

accept it, whereas more than 70% of the persons interviewed consider this strategy as rather or absolutely unacceptable.

Table 3.5-21: Acceptability of site specific strategy (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
27.3	44.7	25.3	2.7

Table 3.5-22 reports the intentions of respondents in case strategy C should be implemented. The majority of the Athens respondents is not willing to pay the charges. In general, there seems to be a readiness either to avoid the pricing scheme or to adapt the own behaviour to the new mobility situation. Most of the people interviewed would drive less or use public transport more often. The respondents would also strongly consider using park and ride facilities more often. But also a majority of the respondents state intentions not to drive tolled routes or to drive at non-tolled times.

Table 3.5-22: Expressed intentions in the case of the site specific strategy (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	10.7	24.8	31.5	32.2
use public transport more often	10.1	18.1	34.9	36.9
use my bicycle or walk more often	17.6	29.7	25.0	27.7
take part in car-sharing	22.1	33.6	32.9	11.4
use park & ride more often	10.1	9.4	34.2	46.3
pay the tolls and drive as before	28.2	35.6	27.5	8.1
not drive tolled routes	15.4	21.5	36.9	26.2
not drive at tolled times	19.5	22.8	35.6	22.1
support a movement to stop the strategy	29.5	32.2	19.5	18.8

Further results

Public acceptability strongly depends on how the revenues are used. Hypothecating revenues increases public support considerably (Jones, 1995). When people were asked about road user charging there was the maximum support by 30% of adults in the UK with a net support (i.e. supporters minus opponents) of minus 27%. When the same respondents were asked whether they would support a package of measures that includes road user charging, with revenues generated from the theme being used to pay for the other elements, then support doubled to 57% with a net support rate of +23% (Jones, 1991b). Similar results were reported in TransPrice. Hence, in the AFFORD Public Acceptability Survey we investigate the attitudes of the respondents regarding how to use the revenues arising from road pricing. At the same time AFFORD introduces new and progressive ways of revenue allocation following the ideas of green tax reform like 'lower income taxes' or 'lower vehicle taxes'. But there is a second

aspect which is highly related to the use of revenues. One problem of hypothecating revenues is that the promise of the reallocation must be credible. There is some evidence (FAW, 1995) that at least some people are not convinced about the expressed or published objectives of road pricing and thus do not believe in the sincere use of revenues. E.g. 12.7% of the participants in the MOBILPASS field-trial in Stuttgart indicated that road user charges are not a practical decision but a political. They suspected that road pricing is just another form of taxation (Jones, 1998).

First, the results of the AFFORD survey show clearly that the majority of the Athens respondents want the money to be used in a more conventional manner (see fig. 3.5-4). Around 90% of persons asked state that the money should be used for traffic flow and public transport improvements. Interestingly, the use of lowering vehicle taxes is favoured by 84% of the respondents. This is the highest degree of support compared to all other AFFORD sites. With the exception of state/municipal use (only 33% support) all other ways of using the revenues are supported by the majority of the respondents. On the other hand, the expectations about whether and how the authorities will use the money are rather negative. Only for the unpopular purpose of supporting state/municipal budget the majority expect the revenues to be used.

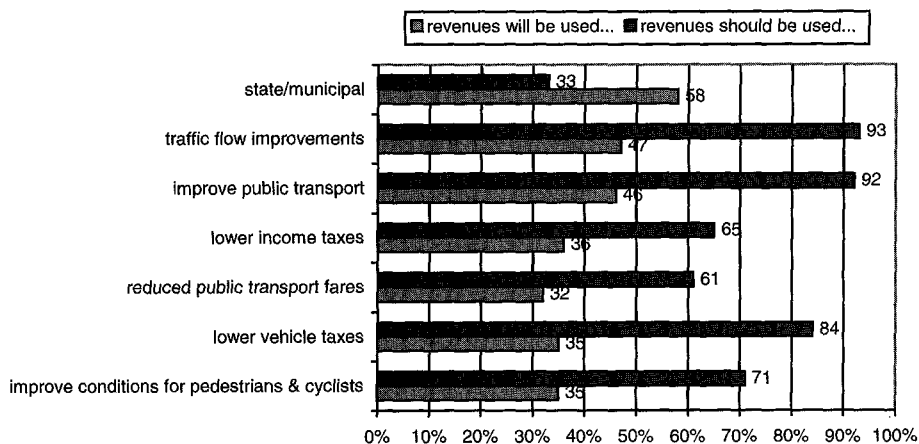


Figure 3.5-4: Revenue allocation (Confirmative responses in %).

The most positive expectations are expressed in the case of traffic flow and public transport improvements. Around one half of the respondents expect the money to be used in this way. All other purposes are expected by only one third of the persons asked.

The last question deals with the people's expectations for themselves if they had to pay more for driving their cars. This refers to the *intrapersonal* level of equity.

But in a more detailed manner it concerns which outcomes the people expect. The hypothesis is the more the people expect positive outcomes for themselves the more they are willing to accept the measure.

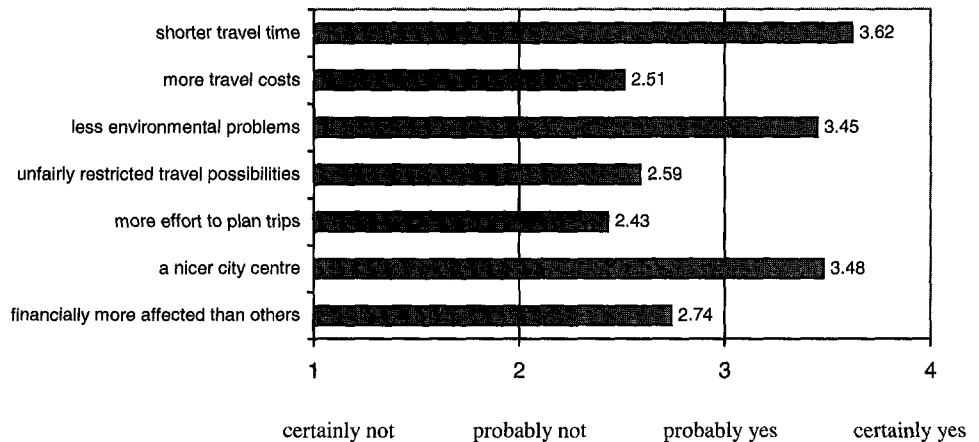


Figure 3.5-5: Equity outcome expectations in the general case of road pricing.

As it can be seen in figure 3.5-5 the respondents of the Athens sample mostly expects positive personal outcomes caused by road pricing. They expect shorter travel times, less environmental problems and a nicer city centre for themselves. About the negative personal impacts of road pricing the respondents are rather irresolute. In the tendency financial disadvantages compared to others are expected. In general the expectations about personal negative outcomes of road pricing are rather moderate. So if it comes to concrete expectations (as well as it was shown for concrete behavioural intentions) the image of road pricing seems to shift to a more positive impression.

3.5.2 Como

Como is one the main towns in Lombardy with a population of 84,000 in 1995, with about 50,000 employees (about 2/3 of them are commuters) and 59,000 cars in 1991. Recently (1990s) Como has become an university town. It is reached by motorways, the Italian National Railway (FS) and the local railway FNM. Public transport in the city comprises bus, lake boat, and funicular. The complex topography and the namesake lake form constraints to the urban mobility system. The city of Como has a significant need to rationalise private transport in order to reduce traffic congestion and atmospheric pollution. The Como *sample* contains 150 men (64.9%) and 81 women (35.1%). Again the median of the income distribution is below the median of the total sample.

The results of the AFFORD public acceptability survey in Como reveal particularly a high general problem perception regarding air pollution from motor vehicles (fig. 3.5.6). All other problems are evaluated as a major problem. Compared to the other AFFORD cities, in Como the general problem perception is second highest.

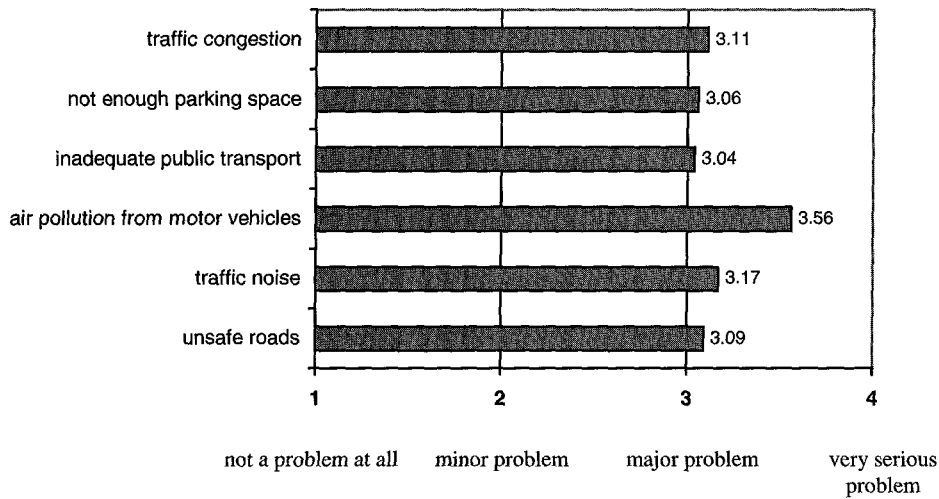


Figure 3.5-6: General problem perception: Mean values.

The affectedness by the problems confirms the results above (see tab. 3.5-23). Most of the Como interviewees feel personally affected by air pollution, followed by congestion and lack of parking space. Surprisingly more than two thirds of the respondents indicate that they are affected by an inadequate public transport.

Table 3.5-23: Personal problem perception (affectedness; in %).

	% who feel personally affected
traffic congestion	79.1
not enough parking space	71.3
inadequate public transport	71.3
air pollution	85.3
noise	58.1
unsafe roads	68.6

Concerning the expectations about further development (see tab. 3.5-24) again mainly air pollution, congestion and noise are evaluated negatively. Only in the case of inadequate public transport and unsafe roads the expectations are more or less neutral. However, in general a deterioration of the transport situation is anticipated.

Table 3.5-24: Problem expectation (in %).

	getting worse	stay the same	getting better
traffic congestion	62.2	33.0	4.8
not enough parking space	48.3	34.3	17.4
inadequate public transport	18.4	67.1	14.5
air pollution	67.4	27.9	4.7
noise	51.1	45.0	3.5
unsafe roads	25.5	61.9	12.6

Compared to the Athens sample the respondents of the Como sample are sure about who should be responsible for the solution of problems (fig. 3.5-7). Almost all respondents attribute a large responsibility to the municipality of Como, i.e. the City council. But a considerable responsibility is also attributed to the state and the public transport companies. A moderate responsibility is attributed to the general group of motorists.

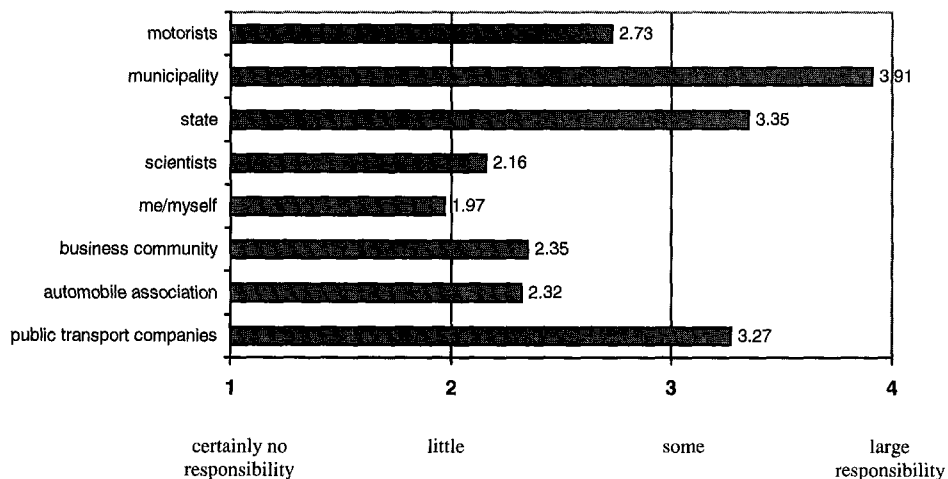


Figure 3.5-7: Attribution of responsibility for the solution of perceived problems (mean).

Concerning the question whether car traffic should be limited the vast majority prefers a limitation at least to some extent (tab. 3.5-25).

Table 3.5-25: A need to limit the traffic? (in %).

no, not at all	not really	to some extent	certainly
5.1	11.5	53.4	29.9

On the other hand, two thirds of the respondents state that it would be difficult to reduce car trips substantially (tab. 3.5-26). Nevertheless, the majority tends to state only a slight dependence on car use.

Table 3.5-26: Perceived difficulty to reduce car trips substantially (in %).

not at all difficult	rather not difficult	rather difficult	very difficult
12.2	23.1	46.3	18.3

Concerning the anticipation of personal effects on driving behaviour caused by road pricing (drive more or less) the respondents report a rather low elasticity of work trips (fig. 3.5-8). This means, that they do not expect a reduction of their personal car use for work trips. However, for leisure and shopping trips they anticipate a moderate reduction.

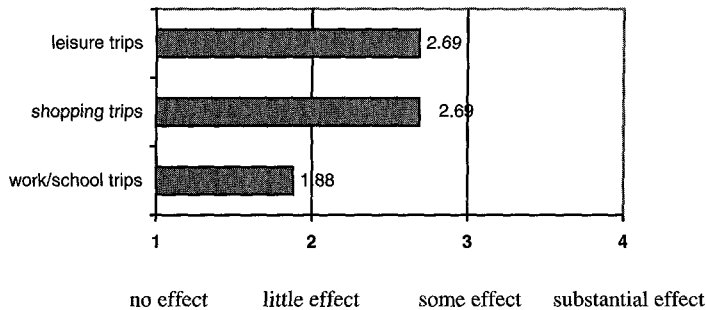


Figure 3.5-8: Self reported price elasticity (mean).

Similar to Athens, the persons asked in Como expect that car driving will become more expensive (tab. 3.5-27).

Table 3.5-27: Will car driving become more expensive? (in %).

no, not at all	probably no	probably yes	almost certainly yes
.9	7.4	52.6	39.1

Evaluation of Strategy A 'Best practice second-best'

One fourth of the respondents indicate to know at least something about strategy A. This result might be explained by the following reasons. The historical centre of Como, called "Walled city", is an Access Control Area. An automatic access control system which includes gates with cameras for recognising the authorised vehicles is now ready to be operated. Residents and authorised vehicles are allowed to enter the area, which is mainly accessible only to pedestrians. Furthermore, in Como studies and tests are carried out to replace the access control policy with a cordon pricing, where a fixed toll will have to be paid by the car users every time they pass through a toll point and enter the city centre. Demonstration and pilot projects are the parking and road pricing area of "Villa Geno" and the financing project of the "Borgovico" tunnel. Also, Como was a

demonstration site of the TransPrice project for which acceptability surveys were carried out as well. Thus, a number of the Como respondents might have been familiar with pricing strategies.

Table 3.5-28: Information about strategy A (in %).

nothing at all	little	somewhat	a lot
37.0	37.4	21.7	3.8

As shown in table 3.5-29 more than one half of the respondents believe that strategy A will not have any or only little effect. Only one third of the persons asked perceive at least some effect. Thus, the evaluation of the effectiveness of strategy A is rather pessimistic.

Table 3.5-29: Perceived effectiveness of strategy A (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
30.0	27.9	31.3	10.7

Correspondingly the personal outcome expectations are rather negative as well. 54.5% of the respondents expect personal disadvantages if strategy A should be introduced in Como.

Table 3.5-30: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
54.5	30.0	15.5

The rejection of strategy A is unanimous. 85% of the respondents would not accept this pricing strategy.

Table 3.5-31: Acceptability of strategy A (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
36.8	48.3	12.0	2.6

In the Como sample the most accepted alternative behaviour to car use is the use of park & ride (see tab. below). This measure could be very effective in Como because of the geography of the area, as there are only few access ways to the city, where parking lots could be built. Also people would use public transport more often. With regard to the adaptation of car use the respondents tend to drive non-tolled routes or at non-tolled times. To pay the tolls and drive as before is not taken into consideration by the majority of people interviewed.

Table 3.5-32: Expressed intentions in the case of strategy A (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	24.8	29.7	32.0	13.5
use public transport more often	19.0	27.1	37.1	16.7
use my bicycle or walk more often	27.1	19.5	27.6	25.8
take part in car-sharing or car-pooling	25.0	29.5	37.3	8.2
use park & ride more often	13.7	23.9	39.8	22.1
pay the tolls and drive as before	37.1	28.1	27.1	7.7
not drive tolled routes	14.3	32.3	32.3	21.1
not drive at tolled times	19.4	20.3	39.6	20.7
support a movement to stop the strategy	32.3	27.8	18.8	21.1

Evaluation of strategy B 'Acceptable'

Although it is similar to a conventional cordon pricing scheme, Strategy B is surprisingly more unknown than strategy A (tab. 3.5-33). Probably the people interviewed know the concept of pricing, but they are not able to distinguish between two different pricing policies: in other words, they know pricing, but they do not know the variations of such a policy.

Table 3.5-33: Information about strategy B (in %).

nothing at all	little	somewhat	a lot
44.8	40.9	11.7	2.6

Nevertheless, there is a considerable increase in positive evaluation of the effectiveness of strategy B although, the overall evaluation of strategy B is only moderate.

Table 3.5-34: Perceived effectiveness of strategy B (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
21.0	27.5	43.2	8.3

This fact continues for the expectations about personal advantages and disadvantages. Compared to strategy A there is a slight decrease in the expectation of disadvantages following for strategy B.

Table 3.5-35: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
47.6	33.8	18.7

The rather positive trend of the evaluation of strategy B also holds for the expressed acceptability. Compared to strategy A, strong rejection ('absolutely unacceptable') has decreased about one half and moderate support ('rather acceptable') has increased about 20%. Nevertheless, compared to the other AFFORD sites acceptability in Como is rather low.

Table 3.5-36: Acceptability of strategy B (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
18.4	47.4	32.5	1.8

Concerning the intentions generated by strategy B it is noteworthy that - compared to the ones expressed for strategy A - there is a noticeable increase (~9% points) in the respondents intention to pay the tolls and drive as before.

Table 3.5-37: Expressed intentions in the case of strategy B (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	29.5	31.3	31.3	7.8
use public transport more often	17.0	29.4	36.2	17.4
use my bicycle or walk more often	27.4	20.5	28.8	23.3
take part in car-sharing or car-pooling	28.1	30.9	32.7	8.3
use park & ride more often	15.6	24.6	38.4	21.4
pay the tolls and drive as before	25.6	30.6	36.5	7.3
not drive tolled routes	14.7	35.5	34.1	15.7
support a movement to stop the strategy	33.8	27.4	19.6	19.2

Como Site Specific Strategy

The Como site specific strategy includes the measures which are being derived from the present policies (see tab. 3.5-38). A road pricing measure is not to be expected in the near future, except for the access to the more congested tourist areas. The access control policy will be strengthened, including the automatic detection of non-authorized cars. The present parking pricing policy will be extended to also include the residents. In such a way for parking everywhere in the city (the "Convalle") a fee will be due.

Table 3.5-38: Como site specific strategy.

- A wider access control area with automatic access control by electronic devices
- Parking pricing: 154.94 euro annual fee for the residents and 1.03 euro/hr for the others
- Charges to enter and park in some very congested areas, like the tourist areas during the week ends and the summer season,
- and use the revenues to improve parking facilities.

The information about the site specific strategy for Como is about as high as the information about strategy A. The reason for this could be that most of the measures have already been carried out in the city and the strategy aims only to strengthen them. Again, a fourth of the respondents indicates to know at least somewhat about this strategy.

Table 3.5-39: Awareness of site specific strategy (in %).

nothing at all	little	somewhat	a lot
37.1	37.1	21.0	4.8

Of all three strategies the site specific strategy is considered as most effective by the Como respondents (tab. 3.5-40). The number of people evaluating the strategy as very effective is highest. Altogether nearly 70% of the respondents believe that the site specific strategy will have at least some effect.

Table 3.5-40: Perceived effectiveness of site specific strategy (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
11.8	18.9	55.3	14.0

Compared to the other strategies the Como-specific strategy also receives the most positive personal outcome evaluation, although still only less than a third of the persons interviewed expect advantages following from this strategy.

Table 3.5-41: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
35.5	36.0	28.5

The positive trend in the evaluation of the Como-specific strategy further continues for the acceptability-variable. More than half of Como respondents state that this strategy is at least rather acceptable. Although - in the whole - this means only moderate support for the site specific measure, it is again the highest acceptability-score compared to the other two strategies in Como.

Table 3.5-42: Acceptability of site specific strategy (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
17.5	28.8	50.2	3.5

As regards the intentions generated by the strategy, less people reduce the use of their car than in the strategies A and B.

Table 3.5-43: Expressed intentions in the case of site specific strategy (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	29.1	33.2	28.2	9.5
use public transport more often	17.1	34.1	34.6	14.3
use my bicycle or walk more often	23.5	19.8	32.3	24.4
take part in car-sharing or car-pooling	26.2	33.6	33.6	6.5
use park & ride more often	12.2	25.8	38.9	23.1
pay the charges and drive as before	30.8	32.7	30.4	5.6
not drive tolled routes	18.7	34.6	32.7	13.6
not drive at tolled times	18.1	25.5	42.1	14.4
support a movement to stop the strategy	36.7	35.3	13.3	14.7

There is also a reduction of the rate for the use of the public transport. Park & ride is the more chosen alternative (62%).

Further results

Regarding the preferred use of revenues the following findings are revealed.

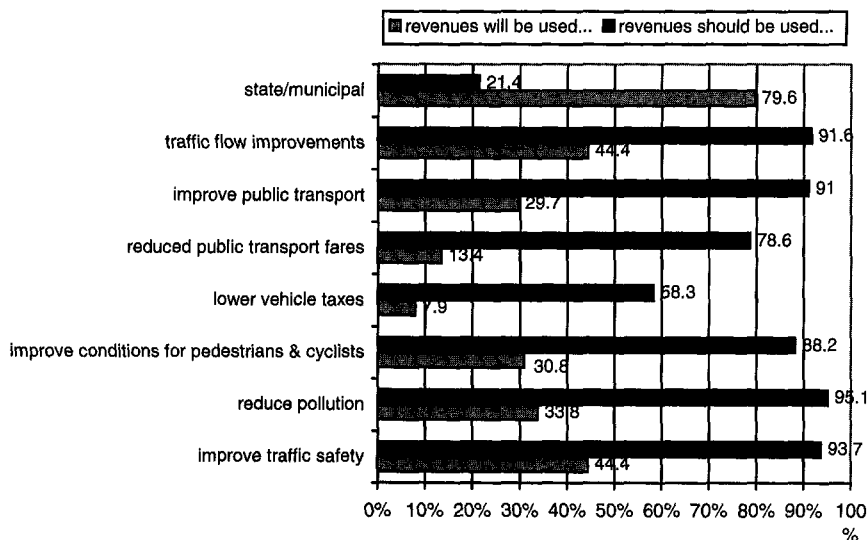


Figure 3.5-9: Revenue allocation (confirmative response in %).

Financial support for the general budget is widely rejected, but expected in fact by around 80% of the respondents. Besides Oslo this is the highest percentage of respondents who expect the use of revenues in such way. All other purposes are considerably more favoured by the majority of the respondents. Although less preferred than purposes like 'improve public transport' or 'reduce pollution', the

uncommon use of revenues for lowering vehicle taxes was supported by 58.3% of the persons interviewed.

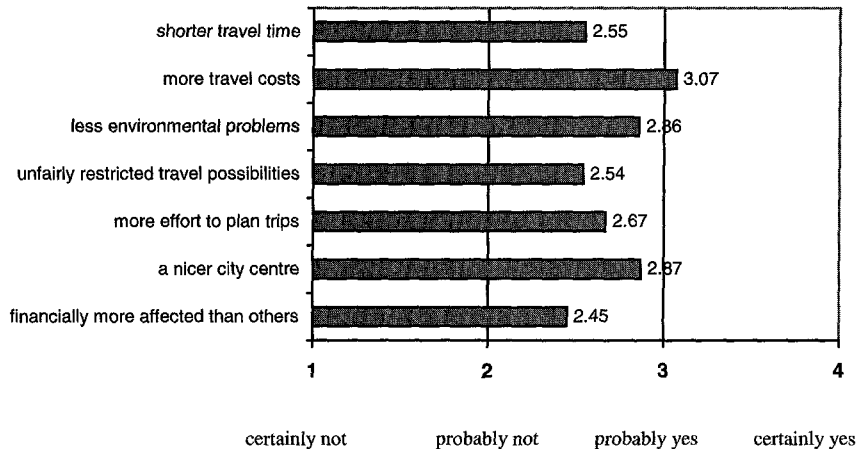


Figure 3.5-10: Equity outcome expectations in the general case of road pricing.

In the Como sample negative equity outcome expectations in the general case of road pricing are predominant although they are rather moderate (fig. 3.5-10). However, positive consequences like less environmental problems and a nicer city centre are expected from the introduction of a pricing strategy.

3.5.3 Dresden

The Dresden sample contains 282 persons, 64.5% men and 35.5% women. Compared to the other cities the number of unemployed in the Dresden sample is rather high (7.5%), although the real unemployment rate in Dresden is much higher (ca. 18%).

The Dresden sample shows a differentiated perception of transport related problems as societal problems. Traffic congestion is perceived as the main general problem, followed by not enough parking space. Air pollution and traffic noise are considered as rather major problems. Inadequate public transport and unsafe roads are less seen as a problem (see fig. 3.5-11).

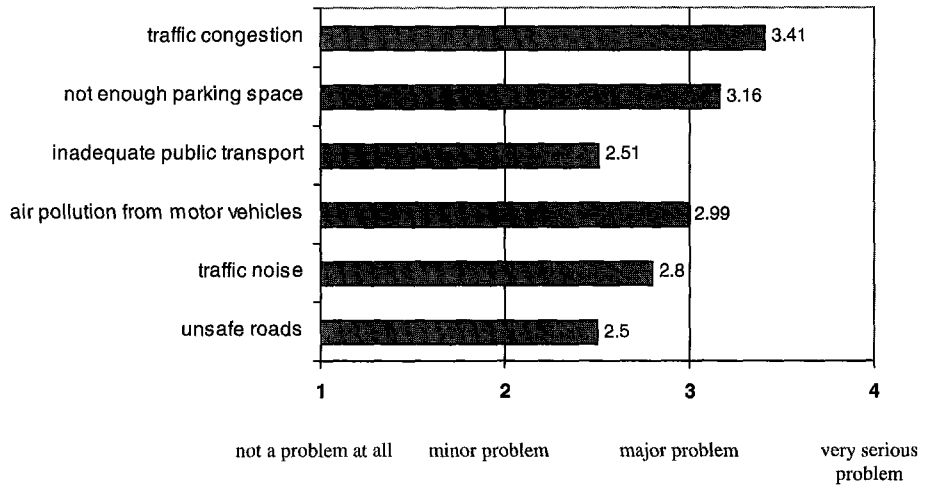


Figure 3.5-11: General Problem perception: Mean values.

The personal problem perception does not differ substantially from the general problem perception. More than $\frac{3}{4}$ of the respondents feel personally affected by congestion.

Table 3.5-44: Personal problem perception (affectedness; in %).

	% who feel personally affected
traffic congestion	84.7
not enough parking space	61.6
inadequate public transport	34.8
air pollution	61.2
noise	52.4
unsafe roads	47.8

The Dresden expectations about further development of the perceived problems differ considerably from the assumed expectations of the other city sites (tab. 3.5-45). Unexpectedly the general problem expectation in Dresden is neutral and compared to the other cities rather positive. With the exception of 'traffic congestion' which a considerable number of respondents expect to worsen, the majority of the respondents expect no changes in the development of the perceived problems over the next five years. Even 42% of the persons interviewed believe that the public transport situation will get better.

Table 3.5-45: Problem expectation (in %).

	getting worse	stay the same	getting better
traffic congestion	44.0	47.6	8.4
not enough parking space	13.3	54.3	32.4
inadequate public transport	10.9	47.1	42.0
air pollution	18.1	52.7	29.2
noise	10.0	63.4	26.5
unsafe roads	24.6	61.8	13.6

Like the Como respondents, Dresden respondents are sure about who to be made responsible for the solution of problems. The main responsibility is attributed to the municipality of Dresden. Almost all of the respondents indicate a large responsibility for the Dresden City Council, but also for the public transport companies and the state. A moderate responsibility is attributed to the business community.

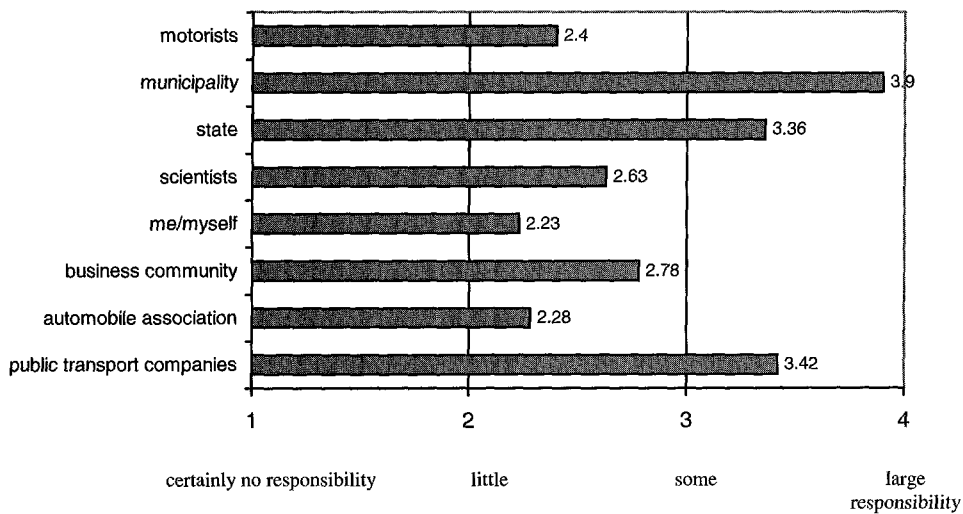


Figure 3.5-12: Attribution of responsibility for the solution of perceived problems (mean).

In Dresden the opinions about whether car traffic should be limited are split (tab. 3.5-46). Whereas merely 60% support at least to some extent a limitation of traffic, 40% of the respondents decline the necessity of traffic reduction. Compared to all other sites, in Dresden support for a limitation of traffic is lowest.

Table 3.5-46: A need to limit the traffic? (in %).

no, not at all	not really	to some extent	certainly
7.2	33.3	42.7	16.8

More than two thirds of the respondents state that it would be difficult for them to reduce car trips substantially. Nevertheless, the majority tends to state only a slight dependence on car use, although, compared to the other cities, in Dresden the number of respondents indicating a difficulty to reduce car trips is highest.

Table 3.5-47: Perceived difficulty to reduce car trips (in %).

not at all difficult	rather not difficult	rather difficult	very difficult
6.1	23.7	41.4	28.8

As regards the anticipation of the personal effects of pricing strategies on driving behaviour, the respondents report a low elasticity of leisure and work trips (fig. 3.5-13). They only expect some effects for the reduction of personal shopping trips, which in turn could be problematic for the business of the inner city.

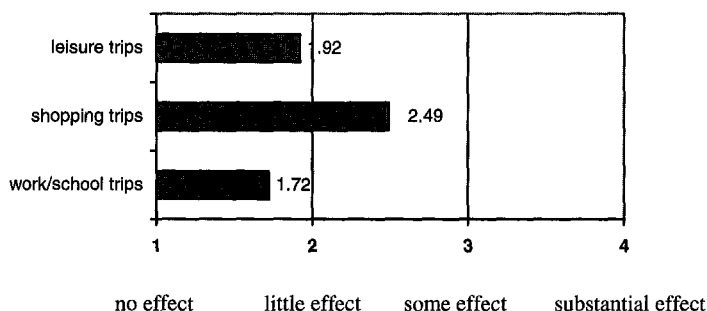


Figure 3.5-13: Self reported price elasticity (mean).

Although the majority of persons asked expect that car driving will become more expensive in the future, a considerable minority of roughly 25% does not expect an increase in car costs. This is the highest number of people of all AFFORD city sites.

Table 3.5-48: Will car driving become more expensive? (in %).

no, not at all	probably no	probably yes	almost certainly yes
8.2	17.1	55.2	19.6

Evaluation of strategy A 'Best practice second-best'

In Dresden a large majority of the respondents is not familiar with strategy A (tab. 3.5-49). One fifth of the persons interviewed state to know at least little about the measure. Compared to the other sites, in Dresden the subjective knowledge level is lowest. These results give rise to the assumption that

transport-related measures in general seem to be less well-known in Eastern-Germany (see Schade, 1999). In particular price-based measures have been unfamiliar in the former socialist countries.

Table 3.5-49: Information about strategy A (in %).

nothing at all	little	somewhat	a lot
77.8	13.6	7.5	1.1

The evaluation of the effectiveness of strategy A tends to be negative although only a minority denies the effectiveness completely (tab. 3.5-50). However, around 40% concede at least some effects on reducing the amount of traffic to strategy A.

Table 3.5-50: Perceived effectiveness of strategy A (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
14.6	46.3	26.7	12.5

The expressed personal outcome considerations reveal clearly that the majority of the respondents expect personal disadvantages for themselves in the case strategy A should be introduced. Only less than 10% would expect advantages.

Table 3.5-51: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
68.9	22.5	8.6

The negative cost/benefit-expectations as shown in table 3.5-51 are reflected in the general acceptability of strategy A (see below). More than half of the respondents state very clearly that they absolutely do not accept this measure. This is the strongest opposition to strategy A of all AFFORD sites.

Table 3.5-52: Acceptability of strategy A (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
57.6	25.2	11.5	5.8

The strong opposition continues for the expression of intentions in the case strategy A should be introduced (tab. 3.5-53). In general, all sustainable modifications are rather denied. The majority of respondents is not willing to use alternative modes more often, to drive less or to pay the tolls. The only accepted adaptations would be to drive uncharged routes or to drive at non-charged times.

On the other hand Dresden respondents state the highest degree of preparedness to support a movement to stop the strategy. To sum up, the Dresden sample generally expresses intentions which do not correspond to the objectives of the pricing strategy. This reminds of the pragmatic definition of acceptance by Van der Laan (1998) as the absence of resistance. However, these are only intentions and not revealed behaviour. But intentions may still be a hint of possible contra-induced behaviour.

Table 3.5-53: Expressed intentions in the case of strategy A (%).

	certainly not	probably not	probably yes	absolutely certain
drive less	27.7	34.9	30.6	6.8
use public transport more often	24.1	36.7	30.2	9.0
use my bicycle or walk more often	26.4	26.7	34.3	12.6
take part in car-sharing or car-pooling	38.2	36.7	20.7	4.4
use park & ride more often	22.3	40.1	31.8	5.8
pay the tolls and drive as before	34.8	38.8	23.2	3.3
not drive tolled routes	5.8	10.1	39.0	45.1
not drive at tolled times	16.1	22.6	42.3	19.0
support a movement to stop the strategy	19.1	26.0	25.6	29.2

Evaluation of strategy B 'Acceptable'

The information or knowledge about strategy B does not differ from the one for strategy A. The system is totally unfamiliar for the large majority of Dresden interviewees.

Table 3.5-54: Information about strategy B (in %).

nothing at all	little	somewhat	a lot
77.1	11.4	7.1	4.3

There are also no major changes in the evaluation of the effectiveness of strategy B. Like for strategy A the effectiveness-evaluation for strategy B is rather negative.

Table 3.5-55: Perceived effectiveness of strategy B (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
11.4	45.4	38.2	5.0

However, the personal outcome expectations shift moderately from *very* negative to *rather* negative, although the majority still expects disadvantages if strategy B should be implemented.

Table 3.5-56: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
53.6	30.7	15.7

The slight improvement in the personal outcome expectations is also reflected in the evaluation of acceptability (tab. 3.5-57). Strong opposition has decreased about 26% points ('absolutely unacceptable') and moderate opposition as well as moderate support has increased about 14% points each. Nevertheless, compared to all other cities in Dresden the level of acceptability is lowest.

Table 3.5-57: Acceptability of strategy B (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
31.1	37.1	25.4	6.4

The intentions in response to strategy B do not show considerable changes compared to the intentions generated by strategy A. In general the majority of the respondents does not intend to adjust their behaviour in a sustainable manner. At the same time they do not want to pay the tolls and to drive tolled routes.

Table 3.5-58: Expressed intentions in the case of strategy B (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	30.6	36.3	27.8	5.3
use public transport more often	21.7	38.8	28.8	10.7
use my bicycle or walk more often	24.9	26.4	35.7	13.0
take part in car-sharing or car-pooling	41.3	37.7	17.8	3.3
use park & ride more often	26.7	38.5	29.7	5.1
pay the tolls and drive as before	30.8	33.3	31.5	4.3
not drive tolled routes	7.6	15.6	37.5	39.3
support a movement to stop the strategy	25.1	26.2	22.9	25.8

It has to be noted that one fourth of the people asked are absolutely certain that they would support a movement to stop the strategy if an introduction was considered. Perhaps this reflects the positive experience of people's force to influence political decisions (German reunification). Further there are indications that in Eastern-Germany the potential of resistance against new tolls is higher than in Western-Germany. For instance, the introduction of reformed charges for the water use was accompanied by a strong resistance against this measure.

Dresden - Site Specific Strategy

Dresden is situated in the south-eastern part of the Free State of Saxony, which borders to the Czech Republic and Poland. The total population is 490,947 inhabitants (1998). The total area comprises 273.22 km². The location of Dresden is characterised by the river Elbe, which flows from the south-east to the north-west and divides the city in two areas. The length of river Elbe within the city boundaries is 30 km. At the moment there are six bridges for the city traffic of Dresden to cross the Elbe. These are not sufficient for the present growth of traffic, and therefore a new, additional bridge is being planned (the so-called Waldschlösschen bridge). This bridge is expected to contribute to a considerable decrease of the present traffic problems, although this point of view is controversial. The begin of building was planned for the middle of 1999 but has been delayed a several times. This, above all, can be put down to the repeatedly uncertain financing of the bridge, which is not surprising in the face of the tense situation of public budgets.

The funding-problem of the Waldschlösschen-bridge formed the starting point for the development of the Dresden site-specific strategy. It was assumed that if the building of the bridge was important to the Dresden motorists but unsure due to a lack of public funds, the motorists would agree paying a toll for the crossing of the bridge. This would guarantee the building of the bridge. The tolls to charge would correspond to the actual fares of the Dresden public transport organisation (DVB). It has to be noted that this strategy was not calculated in economic terms. The aim of this developed strategy is to test if Dresden motorists are willing to pay for the use of the bridge and so to help financing it.

Table 3.5-59: Dresden site specific strategy.

<p>Within the next year the construction of the new Waldschlösschen-<i>bridge</i> should start in Dresden. Imagine, that the financing of this construction could be supported by the following measure:</p> <p>Charge motorists</p> <p>1.25 euro for each crossing of the bridge. There is the possibility to gain a monthly ticket (32.5 euro), a half year ticket (175 euro) or an annual ticket (317.5 euro).</p> <p>And use the revenues:</p> <p>For financing the construction of the Waldschlösschen - bridge</p>
--

Like strategy A and B, the site specific strategy is also very unknown to most Dresden respondents. This was to be expected, because until now a charge for crossing the new bridge has not been discussed.

Table 3.5-60: Awareness of site specific strategy (in %).

nothing at all	little	somewhat	a lot
78.6	8.9	6.4	6.0

The majority of people interviewed perceive only little to no effectiveness at all for the site specific strategy. Compared to the other two strategies, here the number of people denying the effectiveness at all (that is more than a third of respondents) is highest.

Table 3.5-61: Perceived effectiveness of site specific strategy (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
38.6	38.9	16.4	6.1

The personal outcome expectations for the Dresden-strategy are also rather negative. Although - different from the other strategies - there are fewer persons expecting disadvantages following from the site specific strategy, there is a large increase of the number of persons expecting no differences at all. The small number of people expecting advantages is comparable to strategy A, but it is only nearly half as high as for strategy B.

Table 3.5-62: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
41.3	50.2	8.5

Correspondingly to the effectiveness- and outcome expectations the acceptability of the site specific measure is very low. To the Dresden respondents it is slightly more acceptable than strategy A, but less acceptable than strategy B. Still, nearly 80% of the people interviewed rather or strongly reject the site specific strategy.

Table 3.5-63: Acceptability of site specific strategy (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
54.4	24.9	13.9	6.8

The intentions as depicted in tab. 3.5-64 show clearly that a great majority of the people interviewed does not accept the tolls for a crossing of the bridge. They are neither willing to pay the tolls nor to drive less nor to use alternative means of transport. Against that the interviewees state the intention of supporting a movement to stop the strategy or of using one of the other bridges. This would indeed be a very negative effect.

All in all the intentions of Dresden interviewees reflect a clear disapproval of the site specific strategy. The unwelcome intentions are made easier by a multitude of alternatives still being available for the motorists if the presented strategy should be introduced.

Table 3.5-64: Expressed intentions in the case of the site specific strategy (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	60.2	28.0	9.0	2.9
use public transport more often	45.5	34.8	15.1	4.7
use my bicycle or walk more often	45.9	25.8	22.2	6.1
use car-sharing	46.9	39.0	13.0	1.1
pay the charges and drive as before	56.0	25.6	13.4	5.1
support a movement to stop the strategy	21.4	19.9	23.9	34.8
use not charged bridges	5.8	8.6	29.1	56.5
drive more	37.5	50.2	9.7	2.5

Further results

The results concerning the revenue allocation can be divided into three parts: Firstly, the use of money for direct traffic related purposes like 'traffic flow improvements' or 'reduced public transport fares' is accepted by the vast majority (see fig. 3.5-14). The respondents also generally believe that the authorities will spend the money for these purposes, but with one exception. 80% of the respondents do not believe that the money will be used for reducing public transport fares.

Secondly, public use (state or municipal) is refused by around three fourths of the persons asked. However, this use is expected by 64%. Thirdly, the innovative use of revenues for lowering taxes is also refused by a majority. Thus, in the whole, it seems that the respondents do not believe in a direct money hypothecation by reduced taxes or public transport fares.

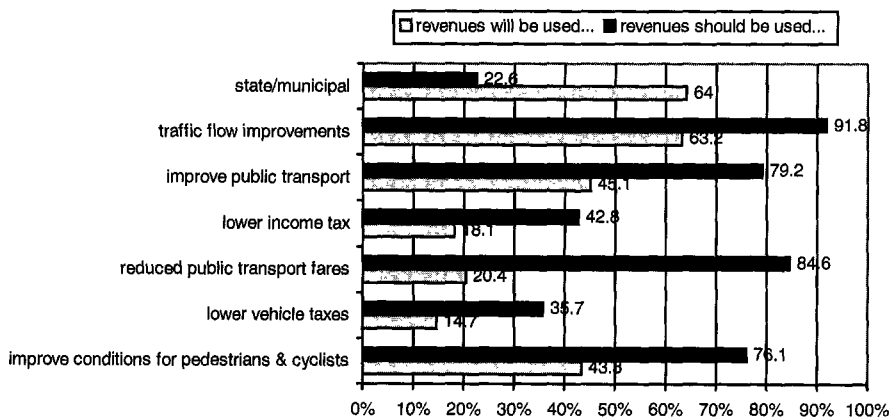


Figure 3.5-14: Revenue allocation (Confirmative responses in %).

In the Dresden sample negative outcome expectations in the general case of road pricing are predominant (see fig. 3.5-15). Additional travel costs, more effort to plan trips and an unfair restriction of travel possibilities are expected to be most likely. In the contrary, all possible positive outcomes are rather not expected to arise.

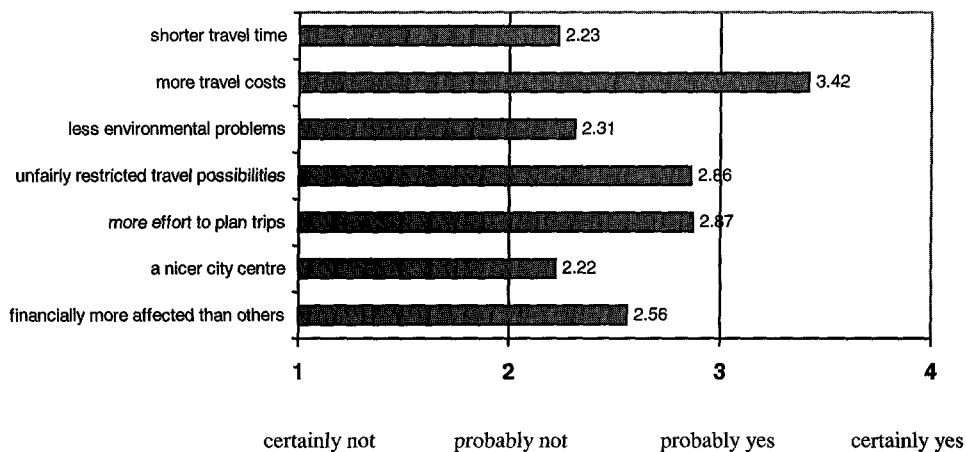


Figure 3.5-15: Equity outcome expectations in the general case of road pricing (mean).

What could be the reason for the very low acceptability in Dresden? First, in the Eastern part of Germany ('Neue Länder') there is a particular high concern about income and money as well as about personal outcome expectations. People feel at disadvantage compared to the Western part of Germany ('Alte Länder'). Secondly, influencing behaviour through prices has been most unfamiliar in former socialist countries and is perceived as unfair (cp. Frey & Pommerehne, 1993). And thirdly, moving without further restrictions and above all driving freely seems to be perceived as a very important achievement gained in the peaceful revolution in 1989. One of the most predominant claims was the call for 'Reisefreiheit' (freedom of travel). On this basis there is a strong and general refusal of pricing strategies. Thus, the people do not differentiate between the three presented AFFORD pricing strategies.

3.5.4 Oslo

The Oslo sample contains 285 persons, 56.5% men and 43.1% women. It is somewhat different from the other city samples. Also, it has to be taken into account that the general income of the Oslo sample is considerably higher than in the other cities as the amount of prices of the presented strategies were equal in all cities.

The evaluation of several states as a general problem is rather moderate (fig. 3.5-16). Air pollution from motor vehicles is perceived as a major problem whereas all other states are evaluated as a bit less serious. Compared to the other AFFORD sites, in Oslo general problem perception is lowest.

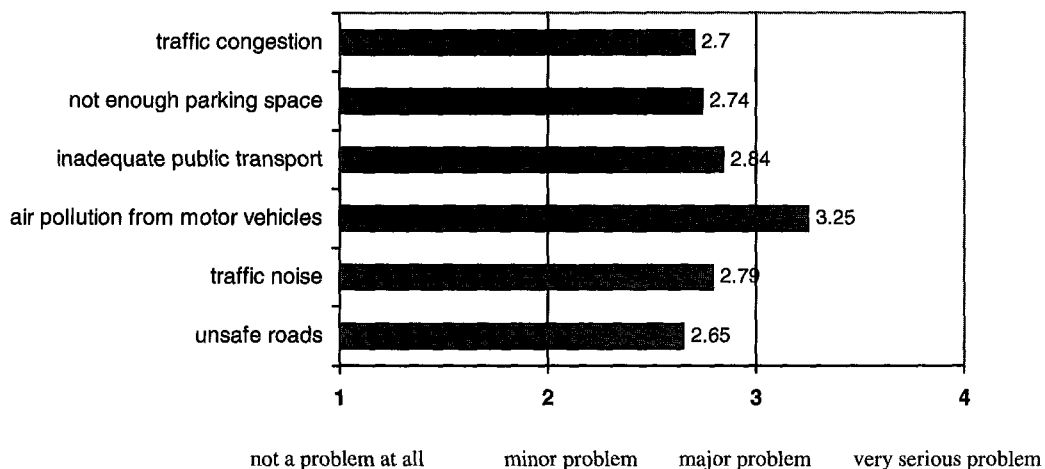


Figure 3.5-16: General Problem perception: Mean values.

The findings concerning whether the respondents feel personally affected by several problems correspond with the results above (tab. 3.5-65). In general, the majority of respondents does not feel affected by the mentioned problems. More than one third of the persons asked indicate that they feel personally affected by a lack of public transport. Only 30% feel affected by congestion. Compared to the other AFFORD cities, Oslo respondents perceive traffic related problems as less serious and less urgent (maybe partly resolved).

Table 3.5-65: Personal problem perception (affectedness; in %).

	% who feel personally affected
traffic congestion	30.2
not enough parking space	40.7
inadequate public transport	37.3
air pollution	37.2
noise	29.0
unsafe roads	25.8

But the respondents are not certain about further developments: Contrary to the rather low level of problem perception the expectations about further development of the perceived problems are surprisingly negative. A majority of

the respondents expects a worsening of problems like congestion, lack of parking space and air pollution. Positive developments are expected by only a very small minority of 2 to 15%.

Table 3.5-66: Problem expectation (in %).

	getting worse	stay the same	getting better
traffic congestion	62.4	31.6	6.0
not enough parking space	56.0	41.8	2.1
inadequate public transport	27.5	57.5	15.0
air pollution	52.0	32.4	15.7
noise	45.4	50.0	4.6
unsafe roads	26.8	60.4	12.9

The attribution of responsibility for the solution of problems is like in most of the other cities (fig. 3.5-17). There is a clear attribution to public institutions like the municipality, the state or the public transport companies (which are often private). A certain responsibility is attributed to the group of motorists. It is noteworthy that the internal attribution of responsibility (me/myself, motorists) is the highest of all sites.

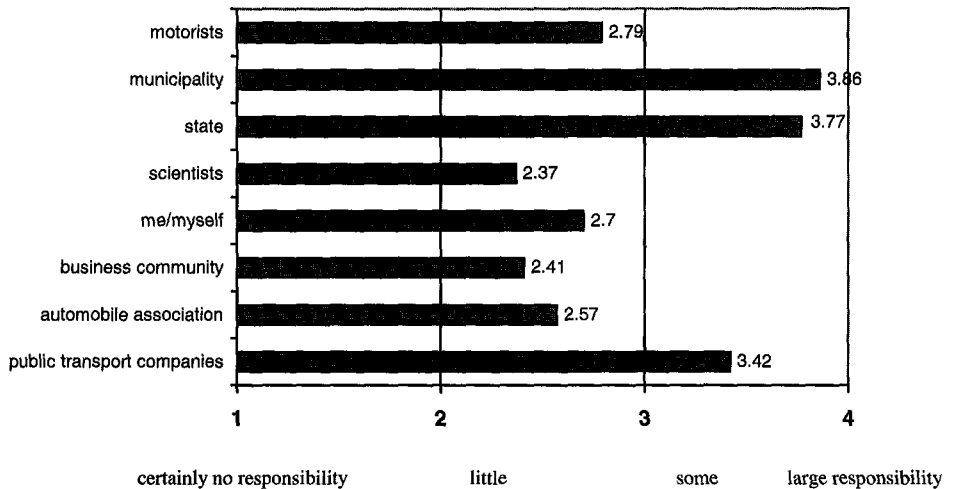


Figure 3.5-17: Attribution of responsibility for the solution of perceived problems (mean).

The vast majority of the Oslo sample (68.6%) states that car traffic should be limited at least to some extent (see tab. 3.5-67). Still, around one third of the respondents deny the necessity to reduce car traffic.

Table 3.5-67: A need to limit the traffic? (in %).

no, not at all	not really	to some extent	certainly
12.4	19.1	40.3	28.3

Concerning the perceived dependency on car use 65.7% of the persons asked report that it would be rather or very difficult for them to reduce car trips substantially

Table 3.5-68: Perceived difficulty to reduce car trips substantially (in %).

not at all difficult	rather not difficult	rather difficult	very difficult
10.7	23.6	40.7	25.0

Figure 3.5-18 refers to the expectations about what personal trips would be (more or less) affected in the case of road pricing. Altogether, the people of the Oslo sample state a very low elasticity concerning a reduction of personal car trips. For leisure and shopping trips little effects are expected, but the respondents are not willing to reduce work trips.

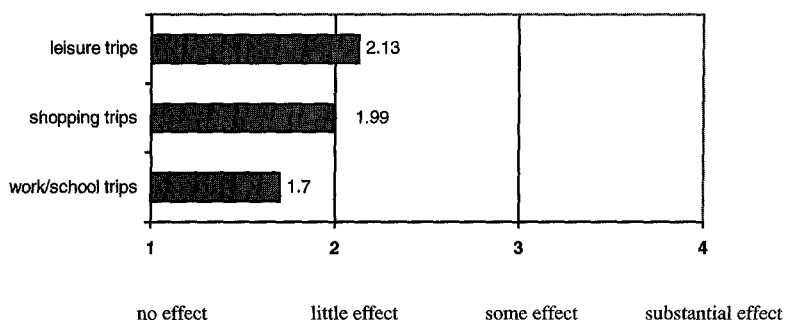


Figure 3.5-18: Self-reported price elasticity (mean).

Regarding the question whether car driving is getting more expensive the response is very clear. Only the minority expects no changes in costs.

Table 3.5-69: Is car driving getting more expensive? (in %).

no, not at all	probably no	probably yes	almost certainly yes
1.1	15.2	65.6	18.1

Evaluation of strategy A 'Best practice second-best'

Differently from the other AFFORD cities the people of Oslo have experience with a road pricing scheme (here: cordon pricing) and some knowledge about it. Thus, it can be assumed that the evaluation *basis* of the Oslo respondents for the presented AFFORD pricing packages differs clearly from the evaluation basis in the other cities.

The people of Athens, Como or Dresden have no experience with any pricing scheme. Some may have heard something or may have an idea about road pricing. However, nobody in these cities has experienced the real effects of a pricing scheme in the own city. A more thorough evaluation based on personal experience and knowledge can be expected for Oslo.

81.3% of the respondents in Oslo indicate to know nothing at all about the presented AFFORD strategy A (tab. 3.5-70). This is not surprising. Firstly, the strategy was designed in AFFORD and is thus new. Secondly, in Athens, Como and Dresden this question has referred to some kind of subjective knowledge (as an impression to know something) about road pricing in general, whereas in Oslo it has rather addressed the *objective personal knowledge* about road pricing. To find out the real objective knowledge about the pricing scheme in the Oslo sample a knowledge test is needed.

Table 3.5-70: Information about strategy A (in %).

nothing at all	little	somewhat	a lot
81.3	14.1	4.2	.4

The perceived effectiveness of strategy A is rather high (compared to other cities). A majority of the Oslo respondents perceive effects on a reduction of traffic at least to some extent. However, in general the respondents are not very sure about the effectiveness and indicate only little or some effects.

Table 3.5-71: Perceived effectiveness of strategy A (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
15.7	30.2	42.3	11.7

The evaluation of the expected personal outcomes is neutral (tab. 3.5-72). The majority of respondents would expect no changes, although the number of interviewed people expecting advantages is higher than the one of people expecting disadvantages following from strategy A.

Table 3.5-72: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
11.0	61.8	27.2

Nonetheless, in general strategy A is not accepted by the Oslo sample (tab. 3.5-73). More than two thirds of the persons asked do not accept this measure. Around one fifth could rather accept strategy A. Thus, in the whole, the acceptability of strategy A does not differ substantially between the four sites.

Table 3.5-73: Acceptability of strategy A (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
42.0	34.3	19.4	4.2

Table 3.5-74 shows the results of the intentions called forth by strategy A. In general around one third of the respondents would intend to modify their car driving habits, e.g. to drive less or to use public transport more often. The correlation between the first five items (from 'to drive less' up 'to use park & ride more often') is very high. That means that mostly the same persons intend to modify their behaviour in the mentioned ways. This leads to the assumption that if somebody is willing to modify his behaviour in general then he intends to do it in several ways. On the other hand, if somebody does not want to modify his

behaviour all adaptive alternatives are rejected. The respondents of the Oslo sample are rather decided to pay the tolls and drive as before or to drive at non- or less-tolled times. Three fourths of the respondents are not willing to avoid crossing the cordon.

Table 3.5-74: Expressed intentions in the case of strategy A (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	30.0	35.0	26.4	8.6
use public transport more often	25.9	41.0	23.4	9.7
use my bicycle or walk more often	35.4	35.0	22.7	6.9
take part in car-sharing or car-pooling	34.4	45.3	17.0	3.3
use park & ride more often	52.4	29.1	13.1	5.5
pay the tolls and drive as before	19.7	28.5	40.1	11.7
avoid crossing the cordon	34.3	40.4	20.2	5.1
not drive at tolled times	17.4	27.2	43.5	12.0
support a movement to stop the strategy	20.3	33.7	29.0	17.0

Evaluation of strategy B 'Acceptable'

The information level about strategy B has slightly increased compared to strategy A, even if the overall level is lowest for all AFFORD sites.

Table 3.5-75: Information about strategy B (in %).

nothing at all	little	somewhat	a lot
78.4	15.5	5.7	.4

In contrast to this, the perceived effectiveness of strategy B is significantly lower than of strategy A (tab. 3.5-76). This is somewhat surprising because in Athens and Como strategy B was seen as more effective than strategy A (in Dresden there was no difference). Perhaps the Oslo sample, who as the only AFFORD-sample has gained experience with real effects of road pricing, perceives strategy B as softer and weaker than strategy A.

Table 3.5-76: Perceived effectiveness of strategy B (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
22.6	41.7	32.9	2.8

The evaluation of personal outcomes following from strategy B is shifted to a more negative view. If strategy B should be introduced one third of the respondents would expect disadvantages for themselves. Notwithstanding, the overall evaluation seems to be neutral.

Table 3.5-77: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
33.7	44.3	22.0

The acceptability level changed significantly from Strategy A to B. Strong resistance ('absolutely unacceptable') decreased by about 26% points whereas moderate support ('rather acceptable') increased considerably (+20% points). This means that almost half of the Oslo respondents have (rather) positive attitudes towards the introduction of strategy B. However, most of the support is only moderate and could be provisional. And some of the arguments for a higher acceptability may relate to a weak perceived effectiveness (thus putting weaker constraints on own behaviour).

Table 3.5-78: Acceptability of strategy B (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
16.1	36.2	40.5	7.2

The weaker influence of the 'acceptable'-strategy on travel behaviour can be seen in the distribution of the expressed intentions. If strategy B should be introduced fewer people would intend to drive less. This tendency significantly⁸ holds for all other cases of alternative behaviour. The weaker influence or power of strategy B also shows in the contradictory behaviour of maintaining car use. More people would intend to pay the tolls and drive as before as well as more respondents would not intend to avoid crossing the cordon.

Table 3.5-79: Expressed intentions in the case of strategy B (%).

	certainly not	probably not	probably yes	absolutely certain
drive less	45.4	41.4	12.5	.7
use public transport more often	34.6	45.0	15.7	4.6
use my bicycle or walk more often	39.5	43.8	14.1	2.5
take part in car-sharing or car-pooling	38.8	46.7	13.0	1.4
use park & ride more often	55.8	33.0	8.0	3.3
pay the tolls and drive as before	10.4	15.1	48.9	25.5
avoid crossing the cordon	40.1	42.2	13.7	4.0
support a movement to stop the strategy	22.0	43.3	24.5	10.1

⁸ Wilcoxon Signed Ranks Test ($p < .01$) for the comparison between strategy A and B.

Oslo - Site Specific Strategy

In brief, the site specific strategy for Oslo corresponds to the objective of marginal cost pricing. Today, most motorists have monthly or (semi) annual passes, making it free on the margin to enter town. The idea of the site specific strategy is to make annual passes so expensive that most people will prefer the discount coupons, by which you pay on the margin, but at a discount compared to single tickets. Recently congestion pricing has been discussed in Norway. The new Minister of Transport has advocated it and suggested a rather stiff charge for entering the city during the rush hour.

Table 3.5-80: Oslo site specific strategy.

Motorists pay
<ul style="list-style-type: none"> • NOK 5000 for an annual pass in the cordon toll ring and NOK 2500 for a semi annual pass, • NOK 500 for a monthly pass, • NOK 30 per passing during the morning rush (7-9 a m), • NOK 10 per passing between 9 a m and 5 p m from Mondays to Fridays, • no charge after 5 p m or during weekends,
and use the revenues:
<ul style="list-style-type: none"> • lower the income tax in Oslo, by reducing the municipal tax rate.

For the Oslo respondents the site specific strategy is the most known of all three presented strategies (tab. 3.5-81). More than 50% of them report to know at least little about this measure.

Table 3.5-81: Awareness of site specific strategy (in %).

nothing at all	little	somewhat	a lot
46.0	22.2	27.1	4.6

The extent of the perceived effectiveness for the Oslo-strategy is similar to the one for strategy A; it is higher than for strategy B. More than half of the respondents believe that the Oslo-strategy will at least have some effect. But in comparison to strategy A fewer people are convinced about the absolute effectiveness of the site specific measure.

Table 3.5-82: Perceived effectiveness of site specific strategy (in %).

will not work at all	will have little effect	will have some effect	will work very effectively
12.0	35.7	45.9	6.4

The evaluation of personal outcomes for the site specific strategy reveals nearly as negative results as for strategy B. Only slightly more than a fourth of the Oslo sample expect advantages following from the site specific measure, whereas a third expects personal disadvantages.

Table 3.5-83: Personal outcome expectations in general (in %).

disadvantage	no importance to me	advantage
34.3	37.8	27.9

It is interesting that as many as 35% of respondents consider the site specific strategy 'rather' or 'totally acceptable' although the overall acceptability of the site specific strategy is rather low. It is more acceptable than strategy A, but less acceptable than strategy B to the people interviewed. Maybe one reason for this is that the revenues of the site specific strategy are used exclusively to lower the Oslo income tax and no money is allocated to the transport sector. If people have to pay for something they want to get something back. In this case there could be the assumption that the motorists have to pay for an overall reduction of income tax and also other people (non-motorists) gain although they did not pay for it (see also fig. 3.5-19).

Another reason for the relatively low acceptability of the site specific strategy can be found in the intentions of the Oslo respondents (tab. 3.5-85).

Table 3.5-84: Acceptability of site specific strategy (in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
33.3	32.3	30.1	4.3

Table 3.5-85: Expressed intentions in the case of the site specific strategy (in %).

	certainly not	probably not	probably yes	absolutely certain
drive less	36.7	43.1	17.1	3.2
use public transport more often	30.6	45.9	16.7	6.8
use my bicycle or walk more often	36.7	41.6	16.7	5.0
take part in car-sharing or car-pooling	34.5	45.0	18.0	2.5
use park & ride more often	50.5	32.5	13.0	4.0
pay the tolls and drive as before	13.0	21.4	46.4	19.2
transfer from pass to single payments	31.0	22.8	27.6	18.7
avoid crossing cordon	35.3	32.7	24.4	7.6
cross cordon when cheap	15.7	25.7	41.1	17.5
support a movement to stop the strategy	19.2	35.5	29.3	15.9

For the strong strategy A the acceptability rate is low whereas the effects on the intentions to modify travel behaviour are very high. The acceptability of the weaker strategy B is high but the effects on the intentions are rather low. Finally, for the site specific strategy there is a medium level of acceptability compared to the other strategies, and also the effects on intentions can be characterised as modest. Therefore the cost of the measure has also an influence on the acceptability of the schemes. The three strategies differ in many aspects, but the price for a single pass within each strategy is as follows:

Table 3.5-86: Toll structure (single pass) of the three Oslo strategies.

Strategy	Toll for a single pass	acceptability (mean)
B	8 NOK	2.38
C	10 NOK	2.05
A	16 NOK	1.85

Perhaps the surprisingly low acceptability for strategy C is mainly caused by the price for a single crossing of the cordon.

Further results

The results concerning the revenue allocation do not differ substantially from the other sites. The common purposes of money use like traffic flow and public transport improvements are favoured by almost all of the respondents. 'To lower income taxes' is not accepted by the majority but 'to lower vehicle taxes' is supported by 62%.

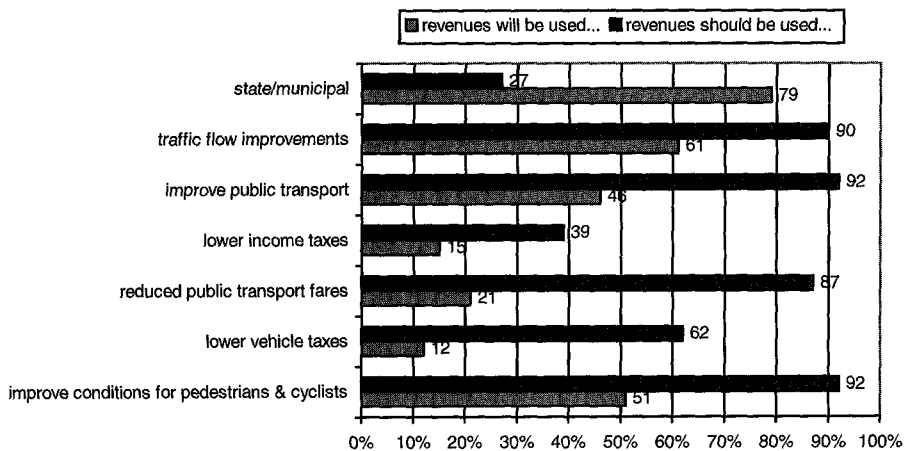


Figure 3.5-19: Revenue allocation (Confirmative responses in %).

On the other hand around 80% of the respondents expect the money to be used for state or municipal purposes which, in turn, is not wanted. The expectations about the use of money are very similar to the other cities. The use for traditional aims like traffic flow and public transport improvements are widely expected whereas a reduction of public transport fares or, in general, the reduction of other taxes is expected by only a very small minority. The equity outcome considerations are shown in the figure 3.5-20.

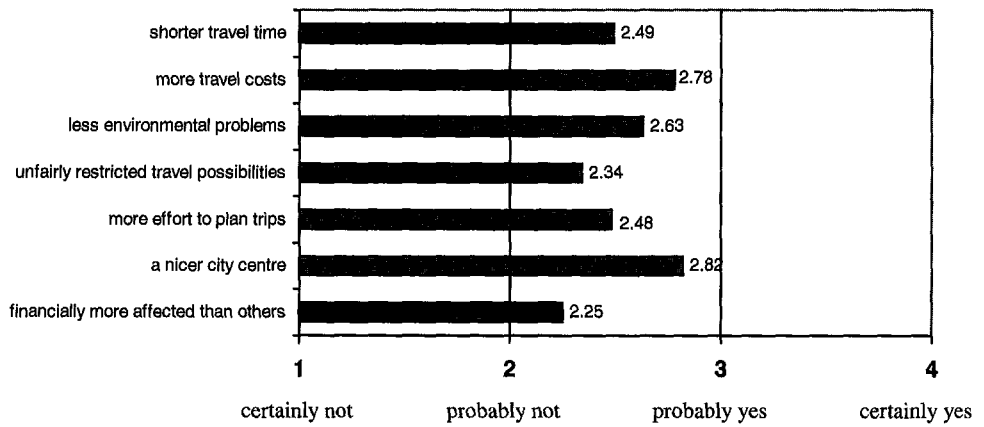


Figure 3.5-20: Equity outcome expectations in the general case of road pricing (mean).

In general the results are rather indifferent. However, positive outcomes like a nicer city centre or less environmental problems are expected to some extent, but also negative outcomes like more travel costs.

3.6 Overall Results

In this chapter the overall results for all AFFORD sites are presented. This is done in two ways:

- (i) Total, for each variable all site results are added up to one aggregated result respectively.
- (ii) Site for site; this allows comparisons between the different sites.

3.6.1 Total

When describing the results of the total sample it is be inappropriate to present the mean values of the total sample. As a consequence of differences between the four cities in the sample size, the combined results would base on disproportional large amount of Dresden and Oslo subjects and an disproportional small amount

of Athens subjects. Therefore, the four samples have been given an equal weight. I.e., in describing the overall results the average of the four sample-means will be presented and referred to as the overall mean.

Problem perception

All the mentioned traffic related items are regarded as major problems. The most pressing problems in the four European cities are air pollution and traffic congestion (see fig. 3.6-1). On average more than 80% of all respondents perceive these as being problematic. However, all other items are perceived as a major problem, as well. Compared to the TransPrice public acceptability survey (Keränen et al., 1999) the AFFORD findings confirm that - apart from problems like traffic congestion and a lack of parking space air pollution is seen as a major problem.

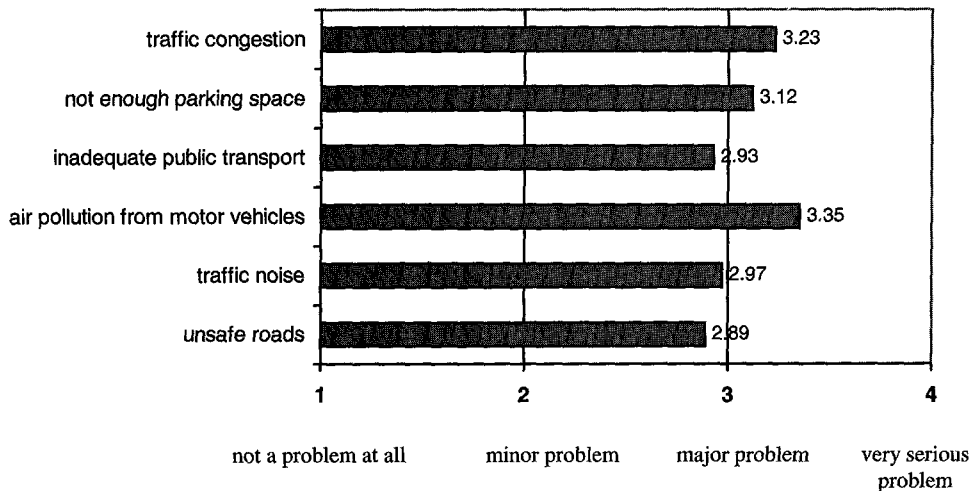


Figure 3.6-1: General problem perception (overall mean).

Concerning the general (societal) problem perception and personal problem perception the results are very consistent. In general the respective traffic problems are more considered as a societal problems than as personal problems (fig. 3.6-2).

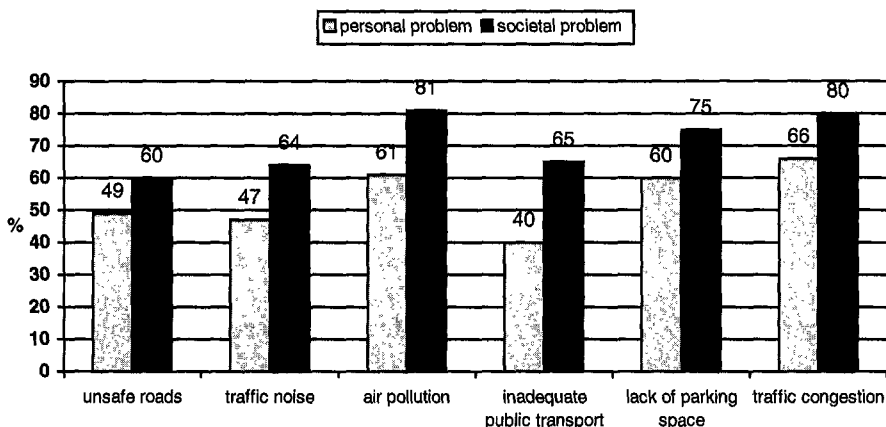


Figure 3.6-2: Evaluation as personal and societal problem (Confirmative response in %).

However, respondents who feel personally affected by a problem evaluate it significantly⁹ higher as a societal problem than subjects who do not feel affected by the problem.

The above mentioned tendency continues for the expectations about the development of the perceived problems (tab. 3.6-1). Negative expectations refer mainly to traffic congestion, air pollution and a lack of parking space. For all other items the majority of the respondents does not expect changes. In general less than one fifth of the persons asked state positive expectations. Together with the high general problem perception this can be interpreted as a pessimistic view of the overall situation.

Table 3.6-1: Problem expectation (total in round %).

	getting worse	stay the same	getting better
traffic congestion	60	34	6
lack of parking space	45	40	15
inadequate public transport	23	55	22
air pollution	47	37	16
noise	38	51	11
unsafe roads	28	59	13

Attribution of responsibility

Based on the finding that environmental and traffic related problems are perceived by a vast majority of the respondents in the four surveyed cities, the

⁹ $p < .01$ with Wilcoxon Signed Ranks Test for two-related-samples.

question is interesting to whom the respondents attribute the responsibility for the solution of these perceived problems. The results are very clear. The responsibility for the solution of the problems is mainly attributed to public entities. For all other groups the attribution is rather neutral. Only, in the tendency there is some attribution to the group of motorists.

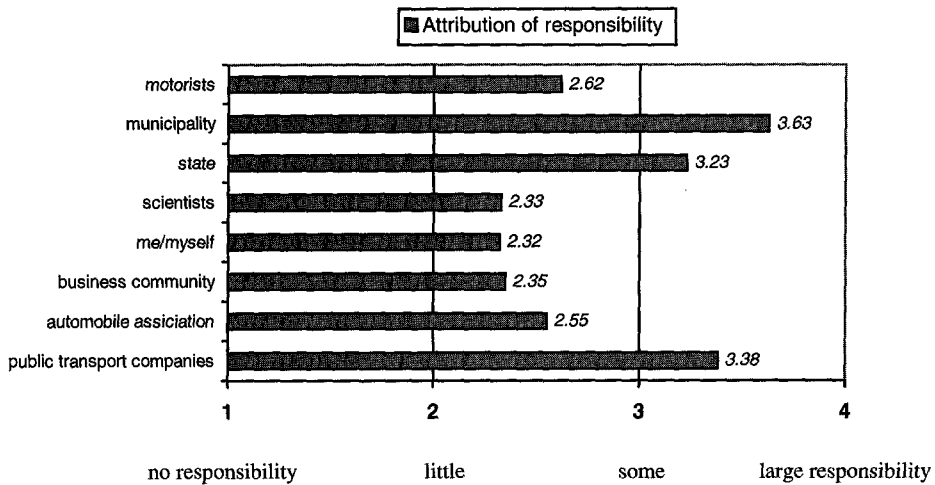


Figure 3.6-3: Attribution of responsibility (overall means).

Revenue allocation

The overall results concerning the revenue allocation confirm the relative homogeneous findings of the different sites. The common purposes of money use like e.g. *traffic flow* and *public transport improvements* are favoured by a vast majority of respondents. 'To lower income taxes' is not accepted by the majority but 'to lower vehicle taxes' is supported by 65.4%. It is obvious that if people, here motorists have to pay fees they want to get something back. In this sense it is very interesting that the car drivers favour the hypothecation of their money to public transport sector.

On the other hand there, around 70% of the respondents expect that the money will be used for state or municipal purposes, which is not wanted. The expectations about the use of money are very consistent between the cities. The use for traditional aims like traffic flow and public transport improvements are widely expected, whereas a reduction of public transport *fares* or in general the reduction of other *taxes* is expected by only a very small minority.

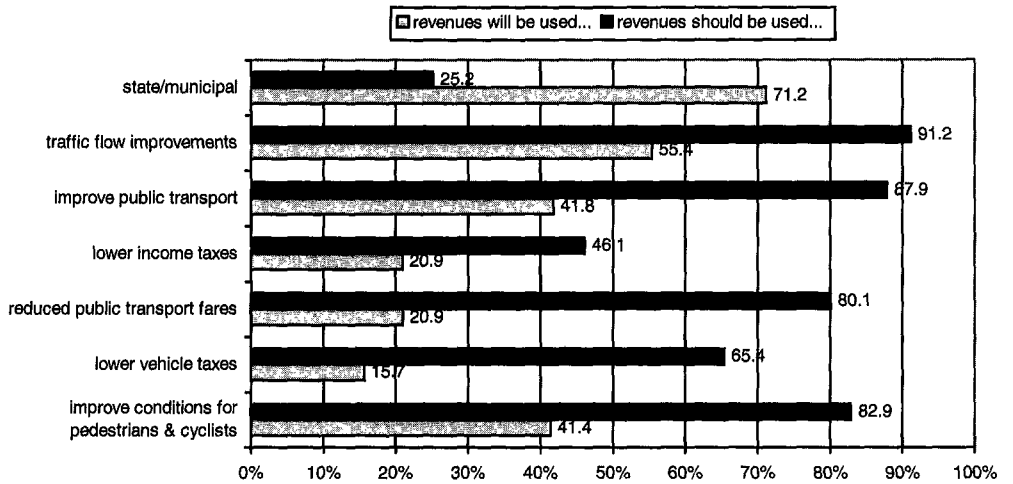


Figure 3.6-4: Revenue allocation (Confirmative responses in per cent).

Traffic limitation

The overall opinion about a limitation of inner city traffic is clear. Almost three fourths of all respondents support a limitation and less than 10% deny a limitation at all.

Table 3.6-2: A need to limit the traffic? (overall in %).

no, not at all	not really	to some extent	certainly
7.2	19.8	43.9	29.1

Capability to reduce car trips

But, if it comes to a reduction of personal car trips, the opposite results to the ones shown above reveal. 65% of all respondents state that it would be difficult to reduce car trips substantially and only 9.8% of the respondents state no dependency on car use. It has to be noted that in particular people who use the car mainly for work trips report a car dependency. People who mainly use other modes (bus, bike etc.) state a lower degree of dependency.

Table 3.6-3: Perceived difficulty to reduce car trips substantially (overall in %).

not at all difficult	rather not difficult	rather difficult	very difficult
9.8	25.2	42.9	22.1

Which car trips would the respondents be willing to reduce if road pricing should be introduced? In general slight effects on *shopping trips* are expected and also little effects on *leisure trips*. Work trips have got the lowest self-reported price elasticity.

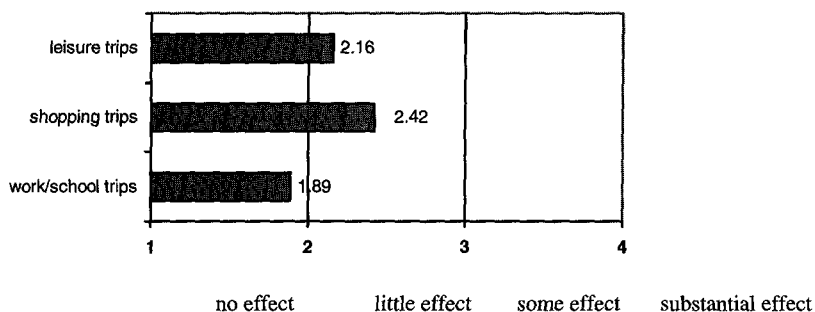


Figure 3.6-5: Self-reported price elasticity (overall mean).

The expectations about the developments of costs in general are rather unanimous. A vast majority expects an increase (tab. 3.6-4).

Table 3.6-4: Will car driving become more expensive? (overall in %).

no, not at all	probably no	probably yes	almost certainly yes
2.9	12.9	58.5	25.6

In the following, the frequency distributions of the *total* sample for the two evaluated pricing strategies A (best practice second best) and B (acceptable) are reported.

Overall evaluation of strategy A (best practice second-best)

The subjective level of information about strategy A is very low. Only 13.5% of all interviewees report to know at least somewhat about strategy A, the majority states to know nothing at all.

Table 3.6-5: Information of strategy A (overall in %)

nothing at all	little	somewhat	a lot
64.5	22.0	11.9	1.6

The perceived effectiveness of strategy A is well balanced. 46.3% admit at least some effects whereas 53.8% deny effects on a reduction of inner city traffic (tab. 3.6-6).

Table 3.6-6: Perceived effectiveness of strategy A (overall in %).

will not work at all	will have little effect	will have some effect	will work very effectively
18.9	34.9	34.1	12.2

All in all, the expectations about personal consequences following from the introduction of strategy A are rather negative, although 38.2% do not expect considerable changes.

Table 3.6-7: Global personal outcome expectations for strategy A (overall in %).

disadvantage	no importance to me	advantage
41.6	38.2	20.2

However, the refusal of strategy A is strong. Only 15.7% of all respondents rather accept strategy A and only 4% accept it totally (tab. 3.6-8).

Table 3.6-8: Acceptability of strategy A (overall in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
43.6	36.7	15.7	4.0

The perception of social pressure to accept the strategy is a little bit higher.

Table 3.6-9: Perceived social norm to accept strategy A (overall in %).

very unlikely	rather unlikely	rather likely	very likely
35.3	41.5	18.6	4.7

Overall evaluation of strategy B (acceptable)

The information level about strategy B is also very low, with no major changes compared to strategy A.

Table 3.6-10: Information about strategy B (overall in %).

nothing at all	little	somewhat	a lot
65.9	22.3	9.5	2.3

The perceived effectiveness of strategy B does also not differ considerably from the one of strategy A. 45.5% of all AFFORD respondents consider strategy B as at least somewhat effective.

Table 3.6-11: Perceived effectiveness of strategy B (overall in %).

will not work at all	will have little effect	will have some effect	will work very effectively
17.2	37.3	39.8	5.7

For the personal outcome expectations there is a slight shift to more positive expectations (tab. 3.6-12). However, expectations about personal disadvantages are still prevailing (41%).

Table 3.6-12: Global personal outcome expectations for strategy B (overall in %).

disadvantage	no importance to me	advantage
41.0	34.9	24.1

But, in contrast to strategy A, strategy B is rather well accepted. Strong refusal has decreased by about a half and slight approval ('rather acceptable') has doubled. There are no changes in strong support which remains around 5%.

Table 3.6-13: Acceptability of strategy B (overall in %).

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
20.9	40.4	34.2	4.7

The shift to more positive attitudes towards strategy B as shown above continues and is confirmed by the perception of social pressure to accept this strategy.

Table 3.6-14: Perceived social norm to accept strategy B (overall in %).

very unlikely	rather unlikely	rather likely	very likely
21.8	40.7	31.0	6.5

Concerning the detailed equity outcome considerations the results are rather indifferent (fig. 3.6-6).

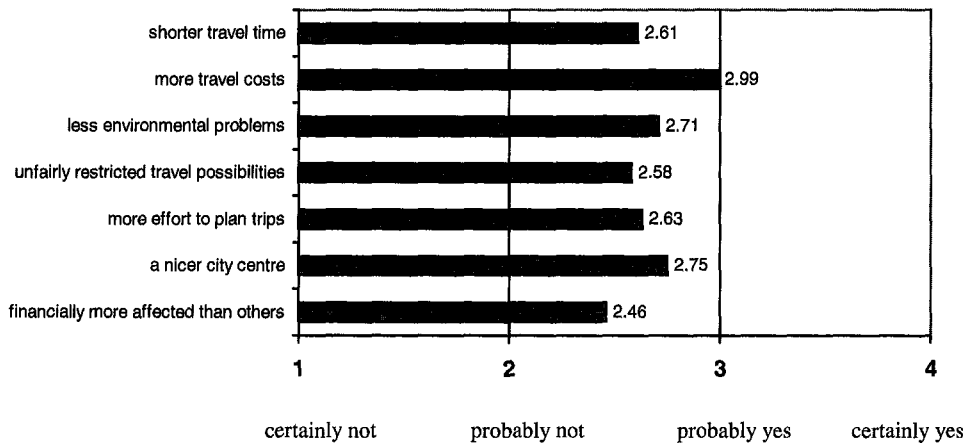


Figure 3.6-6: Equity outcome expectations in the general case of road pricing (mean values).

However, beside the negative outcome of increased travel costs, positive outcomes like a nicer city centre and less environmental problems are expected at least to some extent. It is noteworthy that the expectation of shorter travel times (lowering of congestion) is not a dominant expectation. The least expected outcome is to be financially more affected than other people.

3.6.2 Site for Site Results

In the following the four AFFORD sites will be compared with respect to the main measured variables of the public acceptability. Mainly frequency distributions and mean values will be reported.

Table 3.6-15 shows the percentage of respondents by sites who rated the traffic issues as a 'major problem' or 'a very serious problem'. There are considerable differences in general problem perception between the four sites. In Athens all items are rated as a problem by nearly all respondents. This result confirms the findings of the TransPrice survey (Keränen et al., 1999) where also a very high problem perception for Athens was found. There is also a high awareness of problems in Como, with the exception of direct traffic related problems. In particular these problems ('congestion' and 'a lack of parking space') are perceived as very serious in Dresden, which may be due to the fact of the special traffic situation in Eastern-Germany after the reunification. However, in Dresden all other items are rated as less serious than in Athens and Como. The lowest problem perception is found in Oslo where especially air pollution and an inadequate public transport are perceived as problematic.

Table 3.6-15: General problem perception - Confirmative response (%).

Problems	Problem perception				
	TOTAL	Athens	Como	Oslo	Dresden
air pollution from motor vehicles	83	95	90	81	73
traffic congestion	82	Athens 97	Dresden 94	Como 79	Oslo 65
not enough parking space	77	Athens 97	Dresden 81	Como 73	Oslo 65
inadequate public transport	67	Athens 91	Como 76	Oslo 69	Dresden 46
traffic noise	67	Athens 79	Como 76	Dresden 63	Oslo 59
unsafe roads	62	Athens 88	Como 74	Oslo 54	Dresden 46

In the whole, it can be said that the AFFORD results confirm earlier findings about the problem perception (e.g. Bartley, 1995; Schlag & Schade, 2000). In general there is a high perception of several problems caused by traffic. The three *main problems* which are perceived by a vast majority of all respondents are **air pollution, congestion** and a **lack of parking space**. Beside traffic related problems the interviewed car drivers perceive traffic induced *environmental* problems as well.

Responses to the question whether car traffic should be limited show the same ranking. Further analysis reveals that there is a relationship between the perception of rather environmental problems and the support of traffic limitations. This means that respondents who evaluate e.g. air pollution as a major problem state a more positive attitude towards traffic limitations than people who do not perceive air pollution as a problem ($r = .37, p < .01$)

Table 3.6-16: A need to limit the traffic? (Confirmative responses in %).

Total	Athens	Como	Oslo	Dresden
73	89	82	68	59

The following table (see tab. 3.6-17) summarizes the descriptive results (mean values) for the evaluation of the two AFFORD strategies. Strategy A is the so called '*best practice second-best*' strategy and strategy B is the so-called '*acceptable*' strategy. As can be seen for the total sample, the subjective information levels for both strategies are very low. This is not surprising because the strategies are new. However, there are differences between the sites. There is very little knowledge in Dresden and Oslo and rather little in Athens and Como. This gap could be due to the fact that a) in Oslo the question referred to the objective knowledge because of an already existing pricing system and that b) in

Dresden as part of a former socialist country the knowledge about *pricing* instruments is in general low. The Athens and Como respondents - on the other hand - seem to feel to be better informed about the strategies.

Table 3.6-17: Overall evaluations of strategies A and B.

	Strategy	Information	Perceived effectiveness	Personal outcome expectations (equity)	Acceptability
Total sample	A	1.50	2.39	-.21	1.80**
	B	1.48	2.34	-.16	2.22
Athens	A	1.70	2.51	.07*	1.96**
	B	1.69	2.56	.30	2.29
Como	A	1.92**	2.23*	-.39*	1.80**
	B	1.72	2.38	-.28	2.17
Dresden	A	1.32	2.37	-.60	1.65**
	B	1.39	2.37	-.37	2.07
Oslo	A	1.23	2.50**	.16**	1.85**
	B	1.27	2.15	-.11	2.38

All mean values can vary from 1 (e.g. know nothing at all, absolutely unacceptable) to 4 (know a lot, totally acceptable) with the exception of personal outcome expectations (equity) where values can vary from -1 (expected disadvantages) to +1 (expected advantages).

Wilcoxon Signed Ranks Test:

* Difference between strategy A and B is significant at the 0.05 level.

** Difference between strategy A and B is significant at the 0.01 level.

The effectiveness-evaluation of the two strategies with respect to the reduction of inner city traffic is much higher than the information level. Thus, respondents may believe that demand management is to some extent capable of successfully addressing current transport problems, and accordingly, that the public is prepared to trust these measures even if they are new and unknown (Schlag & Teubel, 1998). In Athens and Como the perceived effectiveness of strategy B is higher than of strategy A (but only in Como slightly significant), in Dresden it is at least the same, in Oslo the stronger strategy A is perceived as more effective than strategy B. Again, this finding could be due to the fact that the respondents of the Oslo sample have experience with an existing pricing scheme, allowing a more realistic evaluation of the effects than in the other cities where the evaluation may be very subjective.

Concerning the *personal outcome expectations* (equity) it can be said that for the total sample there are no significant differences in the expectations about personal (dis-) advantages between the two packages. All in all, the majority of respondents rather expects disadvantages following from the introduction of the two strategies. However, there are differences between the sites. In Athens, Como and Dresden respondents expect more advantages of the strategy B than of strategy A. In Athens the personal outcome expectations tend to be generally rather positive with even a majority expecting advantages of the "acceptable" strategy.

Only the Oslo respondents expect more personal advantages of strategy A than of strategy B, a finding which cannot be explained, yet.

In general, both strategies are rejected by the respondents (see tab. 3.6-18). As expected, rejection is stronger regarding strategy A. But there is a significant increase in support from strategy A to strategy B. Nevertheless, the so called "acceptable" strategy B is still not accepted by a majority. In Dresden rejection of both strategies is strongest. In Como the attitudes towards both pricing strategies are also very negative. In Oslo there is a strong refusal of strategy A but strategy B is rather accepted. In Athens the attitudes towards both strategies in general are less negative.

Table 3.6-18: Acceptability (% who rate the strategy as rather or totally acceptable).

Strategies	Support in %				
A	Total 20	Athens 25	Oslo 24	Dresden 17	Como 15
B	39	Oslo 48	Athens 43	Como 34	Dresden 31

Table 3.6-19 shows a cross-comparison of the responses towards the two strategies A and B. 53% of all respondents reject both strategies. 27% accept the weaker strategy B, but reject strategy A. Only 12% of the respondents accept strategy B as well as strategy A. It is surprising that 8% of the people interviewed accept the stronger and more expensive strategy A, but reject the softer and cheaper strategy B (these are around 40% of all supporters for strategy A).

Table 3.6-19: How supporters and opponents of strategy B reacted to strategy A and vice versa.

		Strategy A		%
		not accepted	accepted	
Strategy B	not accepted	53%	8%	61%
	accepted	27%	12%	39%
		80%	20%	100%

Based on the descriptive figures above the increase of acceptability from strategy A to strategy B can not be explained. All variables do not vary significantly between the two strategies on the overall level. However, there are some rather unsystematic differences on the city level. To analyse the relations between the different variables further statistical investigations on a multivariate basis are necessary.

3.7 Factors Influencing the Degree of Acceptability

In this section multivariate statistical methods like factor and regression analysis are used to investigate - above all - the questions

- i) how the low level of acceptability for the various pricing strategies can be explained and
- ii) which factors are influencing the degree of acceptability.

For this a two-step procedure has been chosen (cf. Schade, 1999): First, with a factor analysis the extensive data are reduced to an appropriate minimum. Many of the used variables (e.g. problem perception, important aims to reach, internal attribution of responsibility, intentions etc.) base on a multitude of items, which cannot all be examined with regard to their relation with acceptability. The factor analysis allows the statistical reduction of data to prepare them for the use of a regression analysis. Based on theory the regression analysis it applied to investigate which variables contribute to the explanation of acceptability.

3.7.1 Factoranalytical Results

The use of factor analysis in this study was motivated by the following reasons:

- a) to prove the theoretically assumed dimensions of certain scales like internal vs. external attribution of responsibility, personal vs. social aims to reach, positive vs. negative personal outcome expectations,
- b) as a tool to reduce data and to generate further hypotheses, in particular for variables for which no a priori assumptions about the structure have been put up. This reduction will allow for an effective and economical analysis of the influence of key variables on the acceptability of pricing strategies.

Factor analysis is a statistical method to reduce a comparatively large number of variables to a limited number of factors, i.e. independent quantities of influence. Variables correlating highly with each other are united to one factor and variables of different factors at best correlate low. The first step of the analysis involves a z-standardisation of scores, so that their mean is 0 and their standard deviation is 1. Then, Pearson product-moment correlation for all involved variables is determined. On the basis of the resulting correlation matrix further calculations are carried out.

If it has not already been specified at the beginning of the analysis, the number of factors to be extracted depends on the eigenvalues of each factor. At first there are as many factors as variables, but factors are only taken into further consideration if their eigenvalue is at least 1, i.e. if they explain a certain share of the whole variance of all variables.

After defining the number of factors a matrix is produced that shows the relations between extracted factors and variables. Ideally variables should correlate highly

especially with one of the factors and comparatively low with the others. To crystallise just those relations the factor matrix usually has to be rotated. The most common method here is the varimax rotation that maximises the number of variables loading high on a factor.

The crucial purpose of a factor analysis is to find factors that can be interpreted meaningfully in psychological content.

The factor analysis of the AFFORD variables was carried out for the total sample. The principal components extraction method and varimax rotation were used.

As it can be seen in table 3.7-1 for the variables 'important aims to reach', 'personal outcome expectations' and 'attribution of responsibility' the assumed dimensions are confirmed. For instance, the different attribution of responsibility for the solution of perceived problems is represented clearly by internal and external entities. The reliabilities (Alpha Cronbach¹⁰) of the scales are rather low, which is not surprising because of both the heterogeneity of the underlying items as well as of the four different city samples. However, all theoretically presumed differentiations are corroborated.

Table 3.7-1: Some factors created by factor analysis and their descriptive values.

Scale	Number of items	Alpha Cronbach	Mean	Total variance explained
social aims	5	.60	3.30	44.97%
personal aims	4	.58	2.84	
Outcome expectation (expected advantages)	3	.71	2.70	57.42%
Outcome expectation (expected disadvantages)	4	.64	2.67	
Internal attribution of responsibility	2	.74	2.48	56.37%
External attribution of responsibility*	4	.53	3.21	

* The following variables had to be excluded: a) business community b) automobile association

Problem perception factors

For the variable 'problem perception' which is divided in general or societal vs. personal problem perception¹¹ an analysis was done for both problem perception parts separately. The results are shown in the tables below (tab 3.7-2/3).

For the general problem perception two factors have been created which can be interpreted as useful. The first component refers to the perception of rather *environmental* problems (from the car driver's point of view) like air pollution or

¹⁰ Alpha (Cronbach). This is a model of internal consistency, based on the average inter-item correlation.

¹¹ Personal affectedness.

noise resulting from traffic, whereas the second factor comprises the perception of *direct traffic* problems (congestion, lack of parking space).

Table 3.7-2: Factoranalytical results of the scale 'general problem perception'.

Item	1. Factor loading	2. Factor loading	h ² Communalities
traffic congestion	.25	.78	.67
parking space problems	.10	.87	.75
inadequate public transport	.67	.06	.46
air pollution	.81	.04	.66
traffic noise	.79	.11	.63
unsafe roads	.63	.31	.49

1. Reliability (Alpha Cronbach) scale 1 $r = .72$, scale 2: $r = .58$
2. Total variance explained: 60.83%

This differentiation is confirmed also for the personal problem perception, where a so-called environmental and a traffic related component are separated.

Table 3.7-3: Factoranalytical results of the scale 'personal problem perception'.

Item	1. Factor loading	2. Factor loading	h ² Communalities
traffic congestion	.13	.80	.66
parking space problems	.07	.81	.66
inadequate public transport	.48	.02	.26
air pollution	.79	.14	.63
traffic noise	.75	.08	.57
unsafe roads	.56	.39	.47

1. Reliability (Alpha Cronbach) scale 1 $r = .60$, scale 2: $r = .55$
2. Total variance explained: 54.40%

Which further implications does the finding of two rather independent problem perception patterns have? There is a slightly significant positive correlation between both problem perception scales and the acceptability of strategy A and a non-significant correlation between the perception scales and the acceptability of strategy B (see tab. 3.7-4).

Table 3.7-4: Correlation of problem perception scales with acceptability of strategy. A/ B.

	general problem perception (pp)	personal pp	traffic related general pp	environmental general pp	traffic related personal pp	environmental personal pp
Strategy A Acceptability	-.07*	.07*	-.04	.10**	-.02	.09**
Strategy B Acceptability	-.00	-.05	-.12**	.06	-.13**	.00

** Correlation is significant at the .01 level.

* Correlation is significant at the .05 level.

On the one side the correlations between the more differentiated traffic related and environmental problem perception scales show that in the case of strategy A only the environmental perception is in a significant relation with acceptability. That means, that somebody who perceives environmental problems (e.g. air pollution etc.) accepts strategy A more than somebody who perceives mainly traffic related problems. It has no influence on the relationship whether the perception is more personal or general based. On the other side the relationship between the acceptability of strategy B and the more differentiated perception scales is characterised by a significant negative relation between the perception of traffic related problems, regardless whether the perception is general or personal, and the acceptability of strategy B. That means, that a person who perceives mainly traffic related problems rather does not accept strategy B. Summed up, these results indicate that for explaining its impact on acceptability the construct "problem perception" should not be used as a whole but divided into two different parts. The perception of environmental problems rather has a positive impact on acceptability whereas the perception of traffic related problems rather has a negative impact. This may imply that people who perceive e.g. congestion as a main problem oppose measures designed just to reduce congestion. In fact statistical tests reveal that respondents who perceive congestion as a very serious problem stronger oppose strategy A and B than respondents who perceive congestion as a problem to a lower extent¹².

Intention factors

Furthermore we examined the underlying structure of the indicated intentions, for the case that a pricing strategy (A or B) would be introduced (see tables 3.7-5 & 3.7-6). Again, two factors which can be interpreted meaningfully have been created. The first factor can be interpreted as intentions to reduce car use and/or to switch to other modes. The second factor can be described, roughly spoken, as intentions to maintain current car use, at least in a modified manner (so-called "opponents"). Though changes in routes or times are taken into consideration. It has to be noted that the internal consistency of the second factor is very low. This means, that the responses represented by the second factor are not very homogenous. In particular the item 'pay the tolls and drive as before' was answered diversely. Although factor 1 and 2 do not exclude each other, the results reveal clearly that if someone states e.g. to drive less, he also intends to use public transport or to use his bicycle more often (so-called 'adapters'). Thus, in general there seems to be a willingness to adapt behaviour to the new mobility situation. However, these findings are only tentative.

¹² $\text{Chi}^2=15.20, \text{df}=3, p<.01.$

Table 3.7-5: Factoranalytical results of the scale 'Intention generated by strategy A'.

Item	1. Factor loading	2. Factor loading	h ² Communalities
drive less	.80	.06	.64
use public transport more often	.85	-.13	.73
use my bicycle more or walk more.	.74	-.03	.55
take part/join in car-sharing or car-pooling	.50	.20	.29
use park & ride more often	.68	.12	.48
pay the tolls and drive as before	-.38	-.12	.16
not drive tolled (charged) routes	.26	.76	.68
not/less drive at tolled times	.45	.53	.48
support a movement to stop the strategy	-.30	.70	.57

1. Reliability (Alpha Cronbach) scale 1 $r = .79$, scale 2: $r = .23$

2. Total variance explained: 50.63%

Table 3.7-6: Factoranalytical results of the scale 'Intention generated by strategy B'.

Item	1. Factor loading	2. Factor loading	h ² Communalities
drive less	.81	.06	.66
use public transport more often	.84	-.13	.72
use my bicycle more or walk more.	.76	-.03	.58
take part/join in car-sharing or car-pooling	.50	.27	.32
use park & ride more often	.72	.12	.53
pay the tolls and drive as before	-.43	-.03	.19
not drive tolled (charged) routes	.30	.74	.64
support a movement to stop the strategy	-.21	.81	.70

1. Reliability (Alpha Cronbach) scale 1 $r = .80$, scale 2: $r = .15$

2. Total variance explained: 54.05%

Again, the two factors are in a different relation to the acceptability of the two AFFORD pricing strategies. Respondents who are willing to reduce car use ('adapters') accept strategy A as well as strategy B significantly more often than respondents who intend to maintain their current car use ('opponents').

Table 3.7-7: Correlation between acceptability and the two different intention factors.

	Adapters (Strategy A)	Opponents (Strategy A)	Adapters (Strategy B)	Opponents (Strategy B)
Strategy A Acceptability	.17**	-.26**		
Strategy B Acceptability			.16**	-.21**

3.7.2 Regression Analysis

Regression analyses were conducted to examine the main research questions as outlined in section 2.2. On a general level this is the question of how the low level of acceptability for pricing strategies can be explained. Furthermore it is of interest which factors influence the degree of acceptability.

In more detail it has to be ascertained (for instance):

- whether the acceptability of road pricing strategies is in connection with the perception of problems resulting from traffic. The assumption is, that a high problem perception leads to an increased dealing with options for solving the perceived problems. Thus, this is one precondition for road pricing acceptability.
- whether from a higher valuation of common social aims follows a higher level of acceptability of road pricing and whether pursuing personal and gain maximising aims could lead to a refusal of road pricing, because of a threatening restriction of personally important aims?
- whether a higher level of subjective information (knowledge) leads to an increase of acceptability for pricing strategies?
- whether lower scores in the perceived effectiveness go along with a lower acceptability for a certain measure and vice versa. Or does a strategic response on perceived effectiveness occur because respondents try to justify their rejection of painful policy by claiming that they perceive them as ineffective?

Multiple linear regression is a method for explaining relations between more than two variables at a time. Independent variables are related not only to the dependent variable but also to each other. Thus a redundancy of information of every single variable results, and the extent to which a predictor explains the variability of the dependent variable has to be traced. The objective of the method is therefore to form a multiple regression equation by weighting and summing the values of the independent variables in such way that the best possible prediction of any individual's score on the dependent variable is received. The multiple regression has originally been designed for data at interval level, but according to Hays (1994) it is also suitable for categorical or ordinal variables if an appropriate transformation (e.g. dummy coding) has been carried out.

Table 3.7-8: Used symbols and abbreviations.

r^2	=	Coefficient of determination (fit);
B	=	Estimate of the change in the dependent variable that can be attributed to a change of one unit in the independent variable;
β (beta)	=	Beta coefficient, sometimes called standardised regression coefficient, is the regression coefficient when all variables are expressed in standardised (z-score) form;

In this study stepwise analyses were carried out, which stop when no new variable is able to improve the prediction of the dependent variable. Originally, the analyses were done for both the whole sample and the separate city samples because of the assumption that possible relations between the variables could vary between the examined cities. However, here only the more important results of the whole sample are reported. For more information about city site results please see AFFORD Deliverable 2C (Schade et al., 2000).

First the predictive power of the independent variables which were examined in direct relation to the two pricing strategies have been analysed. The variable to be predicted is 'Acceptability', that is the degree of approval or disapproval of the respective strategy (A or B). The independent variables are level of information, perceived effectiveness, general personal outcome expectations outcomes and the perceived social pressure to accept the strategy (social norm).

As can be seen in table 3.7-9, three variables qualified accounting for nearly 30 percent of the criterion variance. A high acceptability of strategy A is to be expected if social pressure to accept such a strategy is regarded as high, if the impact of strategy A to reduce inner city traffic is perceived as effective, and if personal advantages following from the introduction of strategy A are expected. The subjective level of information does not improve the equation, although it is slightly significant. The surprising result is, that the social norm has the most predictive value of all variables. Besides the influence of the social norm only cost-benefit evaluations predict the acceptability of the strategy.

Table 3.7-9: Stepwise multiple regression analysis of the Acceptability of strategy A (total data-set).

Predictor variables	R ²	B	β
social norm	.215	.355**	.354
perceived effectiveness	.262	.189**	.207
personal outcome expectations global	.299	.227**	.203
information	.303	.074*	.066
constant		.152	
F total = 100.829**; df = 4/926			

* .01 < p < .05 **p < .01

The regression analysis for strategy B as shown in table 3.7-10 confirms the findings above. In the case of strategy B, the three variables account for 38 percent of the criterion variance, which is a slight improvement. Again, the social norm, the perceived effectiveness and personal outcome expectations were qualified, with the social norm having the most predictive power.

Table 3.7-10: Stepwise multiple regression analysis of the Acceptability of strategy B (total data-set).

Predictor variables	R ²	B	β
social norm	.301	.364**	.378
perceived effectiveness	.347	.206**	.207
personal outcome expectations global	.381	.224**	.214
constant		.522**	

F total = 189.816**; df = 3/924

* .01 < p < .05 **p < .01

The interactions between the independent variables have not been taken into account for the above-reported analyses. Although there is no multicollinearity¹³ between the predictor variables, mediating relations are possible. A simple cross-table of the variables 'information' and 'personal outcome expectations' in strategy A reveals that with growing subjective knowledge both the expectation of advantages and of disadvantages of the pricing strategy increases¹⁴ (see tab. 3.7-11). I.e. with an increasing knowledge people perceive both more advantages and disadvantages. But when examining this effect for strategy B the Chi-square-test slightly misses the 5% -limit.

Table 3.7-11: Cross-table for the variables 'information' and 'personal outcome expectation' of strategy A.

		(A) - Personal outcome expectation global		
		disadvantage	no importance	advantage
(Strategy A) Information	nothing at all	247 40.6%	259 42.5%	103 16.9%
	little	86 41.5%	67 32.4%	54 26.1%
	somewhat	53 47.3%	30 26.8%	29 25.9%
	a lot	7 46.7%	3 20.0%	5 33.3%

In the following the remaining background variables, problem perception, important mobility aims and responsibility-attribution have been examined in regression analyses, and - together with other analyses - integrated into a general model. For this an arithmetic mean for the variables information, effectiveness, personal outcome expectations, social norm and acceptability has been calculated for the two strategies A and B. All analyses were carried out for the total sample. First, for each bundle of variables (e.g. social vs. personal important aims;

¹³ Collinearity (or multicollinearity) is the undesirable situation where the correlations among the independent variables are strong.

¹⁴ Chi²: 20,97; df = 6; p < .01.

internal vs. external attribution etc.) regression analyses were carried out (not reported here). Then, all variables which showed a significant impact on the acceptability variable have been subjected to a total stepwise multiple regression, of which the results are shown in table 3.7-12.

Table 3.7-12: Multiple stepwise regression analysis for the acceptability of strategy A and B.

Predictor variables	R ²	B	β
social norm	.236	.269**	.274
personal outcome expectations	.317	.296**	.270
perceived effectiveness	.343	.164**	.170
traffic related problem perception	.359	-.179*	-.123
general (societal) important aims to reach	.369	.113**	.083
internal attribution of responsibility	.376	.078**	.088
information	.380	.068*	.065
constant		.320	
F total =80.34**; df =7/918			
* .01 < p <.05 **p < .01			

The variables examined in direct connection with the two pricing strategies (like social norm, perceived effectiveness, personal outcome expectations etc.) reveal again the highest predictive power. The social norm, i.e. the perceived social pressure to accept or not to accept the measure, shows to be the most influential predictor. Against the background of a general information deficit about pricing strategies this finding can be interpreted as follows:

If there is a lack of information and of social comparison possibilities for the evaluation of the presented strategies, an approach to own tentative ideas and valuations is to be expected. If so far only rather few norms have been perceived, the evaluating person assumes that others share his opinion. This in turn clarifies - although rather indirectly - the importance of social norms. Because if social norms were changed in a favourable way towards road pricing, a respective alignment of personal attitudes could be expected. Moreover, most of the people strive for social integration and consonance (Festinger, 1957). The pressure towards conformity exercised by relevant others is one of the strongest factors which influence personal opinions, feelings and behavioural intentions, above all in a situation with a rather uncertain physical basis for judgement. But these influences may go into both directions, favouring or opposing pricing strategies. Today, the latter tendency is more probable.

Besides the social norm especially the personal outcome expectations prove to be an influential predictor of acceptability: the one who expects certain advantages shows a significant higher acceptability for the specific measures. Subjects who expect rather advantages and subjects who expect rather disadvantages from the above-mentioned strategies were compared in a socio-economic check. It reveals that mainly subjects who drive less kilometres on average a year ($r = -.24, p < .01$),

who are not member of an automobile association ($r = -.13, p < .01$), and who tend rather not to take the car to work ($r = -.24, p = .01$) expect advantages from road pricing for themselves.

The effectiveness-evaluation of a strategy also shows to be a variable with high predictive power. Here, it should be referred to Rienstra et al. (1999, 190), in whose opinions 'strategic responses on perceived effectiveness may occur when respondents try to justify their rejection of painful policy by claiming that they perceive them as ineffective.' A tentative test of this hypothesis may be carried out when the variable personal outcome expectations is included. The assumption is that persons who expect mainly disadvantages evaluate the measure as being ineffective to justify their disapproval of road pricing. Table 3.7-13 shows the correlations between the variables "effectiveness", "acceptability" and "personal outcome expectations".

Table 3.7-13: Correlation of perceived effectiveness, personal outcome expectations and acceptability.

	Personal outcome expectations	Acceptability
Effectiveness	.182**	.322**
Personal outcome expectations		.474**

Though there is a relation between the expectation of disadvantages and an as low evaluated effectiveness, this correlation is considerably lower than the correlation between equity and acceptability and between effectiveness and acceptability. If a partial correlation is carried out, with the impact of acceptability excluded then for the correlation between outcome expectations effectiveness, a coefficient of $r = .05$ (n.s.) is obtained. I.e., the relation between the expectation of advantages or disadvantages from road pricing and the acceptability of the strategies is not statistically related to the effectiveness-evaluation of the strategies. Thus, these findings point out that in this study strategic responses are not likely.

Of the background variables, besides problem awareness, especially the general important aims to reach qualify as a predictor for acceptability. This means, the one who perceives socially important aims like rights for cyclists or an improvement of urban living conditions significantly clearer approves of the strategies.

Concerning problem awareness, a perception of traffic-related problems like traffic congestion or lack of parking space rather proves to hinder the acceptability of road pricing.

Socio-economic impacts

In the following the socio-economic impact on the key variables of acceptability (problem perception, information, effectiveness, personal outcome expectations,

acceptability) is examined. As outlined in section 2.2 there are only few reasonable hypotheses about socio-economic characteristics concerning road pricing acceptability. The only assumption is that low income groups should oppose road pricing more often because of their higher marginal utility of money and their decreased willingness to pay to reduce externalities. Conversely, road pricing should receive more support from higher income groups because their value of time is higher and their marginal value of income is generally lower.

The following socio-economic variables were included in the stepwise regression analyses: sex, age, persons living in the household, persons under 17 living in the household, employment status, household income¹⁵, yearly driven kilometres by car, member of an automobile association and usual mode of transport to work (e.g. car or bike etc.)¹⁶.

First we analyse the predictive power of the socio-economic variables on the problem perception was analysed (see tab. 3.7-14).

Table 3.7-14: Stepwise multiple regression analysis of general problem perception.

Predictor variables	R ²	B	β
income 4501-6000 euro	.020	-.234**	-.140
income 6001-8000 euro	.038	-.290**	-.123
income 1001-2000 euro	.045	.105*	.094
persons per household	.053	.076**	.170
usual moving modus - car	.061	-.088*	-0.085
persons under 17 per household	.068	-.059*	-.109
sex	.073	-.075*	-.072
constant		2.951**	
F total = 8.158**, df = 7/726			

* .01 < p < .05 **p < .01

As can be seen above, particularly higher income groups perceive less general and individual problems. Conversely lower income groups perceive more problems. This finding seems to be confounded by the income distribution between the cities. In Athens problem awareness is highest but income lowest whereas in Oslo it is the opposite. Respondents who mainly go by car to work encounter less general problems than respondents who use other (sustainable) modes. This could be interpreted as an effect of cognitive dissonance. Those respondents who mainly use their cars deny general problems to justify their use of car. Strikingly, people living in households with two or more persons under 17 report a lower perception of general problems. As known from environmental

¹⁵ It has to be noted that the highest income group consists mainly respondents from Oslo because of the higher average level of income in Norway.

¹⁶ All categorical data was dummy-coded.

awareness research (Bell et al., 1990), women perceive more general problems than men.

The results concerning the influence on information (subjective knowledge) about the pricing strategies are rather inconsistent (tab 3.7-15).

Table 3.7-15: Stepwise multiple regression analysis of information.

Predictor variables	R ²	B	β
household	.008	.123**	.211
household with persons under 17	.024	-.104**	-.148
income 1001-2000 euro	.033	.195**	.133
income 2001-3000 euro	.040	.149*	.095
profession other	.047	.463*	.093
sex	.053	.108*	.080
constant		.913**	
F total = 6.823**; df = 6/729			
* .01 < p <.05 **p < .01			

Respondents living in bigger households report a higher degree of information whereas people living in households with two or more persons under 17 state a lower degree of knowledge. Surprisingly, rather lower income groups indicate to know something about the presented pricing strategies. As also expected from environmental research (see e.g. Franzen, 1997), men report a higher degree of knowledge than women.

The socio-economic impacts on the perception of effectiveness again are very small (2.7% explained variance). Yet, surprisingly full time employed respondents report a lower degree of effectiveness. In contrast to the finding of Rienstra et al. (1999) older people consider the effectiveness of strategies as lower than young people. However, as found by Rienstra et al. (1999), lower income groups tend to evaluate price strategies as more effective. Rienstra et al. (1999, 195) state that 'this result might be explained by the fact that they¹⁷ expect to be compensated or not to be harmed by these measures'. In the AFFORD survey this interpretation cannot be maintained as shown by the results for the personal outcome expectations variable (see tab. 3.7-17).

¹⁷ the lowest income group.

Table 3.7-16: Stepwise multiple regression analysis of perceived effectiveness.

Predictor variables	R ²	B	β
Employed full time	.009	-.175**	-.121
Age	.016	-.004*	-.079
income 2001-3000 euro	.021	.136*	.078
usual moving modus - public transport	.027	.150*	.077
constant		2.559**	
F total = 5.110**; df = 4/731			

* .01 < p <.05 **p < .01

As expected, the lower income group expect more individual disadvantages whereas the higher income group expect personal advantages following from pricing measures. Perhaps the income impact on the evaluation of the effectiveness is influenced by a third variable which is unknown at the moment. The above interpretation by Rienstra and colleagues seems to be motivated by their 'strategic response' hypothesis saying that the perception of the effectiveness is mediated by evaluations about personal outcomes following from the measures.

Table 3.7-17: Stepwise multiple regression analysis of 'personal outcome expectations'.

Predictor variables	R ²	B	β
usual moving modus - car	.068	-.336**	-.263
profession - unemployed	.079	-.351**	-.099
income 6001-8000 euro	.088	.243*	.084
income 501-1000 euro	.094	-.178*	-.081
profession - other	.099	-.367*	-.078
profession - homemaker	.104	-.259*	-.070
constant		1.971**	
F total = 14.111**; df = 6/728			

* .01 < p <.05 **p < .01

The 'personal outcome expectations'-results as shown in tab. 3.7-17 again do not confirm the strategic response assumption. Following this assumption the lower income group who perceives a high effectiveness would have to expect advantages which is not the case in this survey. Concerning the other variables the results are as expected. People mainly going by car to work, unemployed respondents and homemakers fear disadvantages following from the presented pricing strategies.

Regarding the acceptability of pricing strategies only two dummies of the 'usual moving modus to work'-variable qualified (tab. 3.7-18). Respondents who mainly use public transport or the bike accept the strategies more often than people who mainly go by car. All other socio-economic variables (like sex, age, income etc.) have *no explanatory value* concerning the acceptability variable. This means, that

a prediction of acceptability of pricing strategies based only on socio-economic variables is not possible. The explained criterion variance is again very low (2%).

Table 3.7-18: Stepwise multiple regression analysis of acceptability.

Predictor variables	R ²	B	β
usual moving modus – public transport	.011	.221**	.116
usual moving modus - bike	.019	.267*	.093
constant		1.957**	

F total = 7.256**, df = 2/732

* .01 < p < .05 **p < .01

In conclusion, the results reveal clearly that the perceptions, attitudes and evaluations towards the pricing strategies are influenced only to a low extent by socio-economic characteristics of respondents. This confirms the findings of Rienstra et al. (1999). Nevertheless, there are some interesting additional findings. Although the hypothesis that higher income groups support pricing strategies could not be confirmed, it could be shown that these groups rather expect advantages from the strategies, whereas lower income groups rather expect disadvantages. Still, not all income variables became significant. The reason why this personal outcome expectations-mediated effect (the expectation of advantages of higher income groups) does not influence acceptability remains unclear for the present.

Furthermore, indications were found that the 'strategic response' hypothesis does not apply. This means that it does not come to a mixture of effectiveness-judgement for the strategies and of the weighing-up of personal consequences resulting from the introduction of such strategies.

3.8 Summary and Discussion

Several studies and research projects all over the world have considered transport pricing measures and policies - including all kinds of road and parking pricing - as promising attempts to solve the urgent traffic problems in urban areas. One important precondition for the successful implementation of pricing measures is *public acceptability*. However, empirical findings have shown that the acceptability of such measures is rather low (e.g. Bartley, 1995; Jones, 1991a; Schlag & Schade, 2000). In this section the results of the AFFORD surveys will be summarised and discussed with regard

- (i) to the descriptive results (section 3.8.1)
- (ii) to the theoretical basis as outlined in section 2 (section 3.8.2).

The practical relevance of this survey's findings for a possible enhancement of urban transport pricing acceptability shall be dealt with in section 5

3.8.1 Descriptive Results

As expected, there is a high *problem awareness*, both general and personal. Especially air pollution, congestion and parking problems are considered to be very critical. But there are local differences in the problem perception. Negative expectations about the development of the perceived problems are predominant, which contributes to a rather pessimistic view of the overall situation.

The direct evaluation of the two AFFORD strategies reveals that the subjective level of *information* for both strategies is very low. This is no surprise because the measures are new. However, there are differences between the sites. The knowledge about the measures is very low in Dresden and Oslo and rather low in Athens and Como. This gap could be due to the following: a) in Oslo the question referred to the objective knowledge because there already exists a specific pricing system; b) in Dresden as well as in all former socialist countries knowledge about pricing instruments in general is low. On the other hand in Athens and Como the respondents seem to feel slightly better informed about the measures.

The *perception of the effectiveness* of the two strategies to reduce inner city traffic is much higher than the information level. These overall higher scores for effectiveness than for awareness may indicate that respondents believe that demand management is to some extent capable of successfully addressing current transport problems. Accordingly, the public seems prepared to trust these measures to a certain degree, even where they are new and unknown. Concerning the personal outcome (as a first and easy to communicate approximation to *equity*) the majority of the respondents expects more disadvantages for themselves following from the introduction of road pricing.

The *responsibility* for the solution of the perceived problems is mainly attributed to public entities like the municipality, the state or the public transport companies whereas a majority of respondents denies to be personally (jointly) responsible for the solution of problems. Furthermore the overall opinion concerning a *limitation of inner city traffic* is clear. Almost three fourths of all respondents support a limitation. But if it comes to a reduction of personal car trips the opposite result appears. 65% of all respondents state that it would be difficult to reduce car trips substantially. So, which car trips would the respondents be willing to reduce? In general slight effects on shopping trips are expected and also some effects on leisure trips. Work trips have the lowest self-reported price elasticity.

It has been found, as expected, that at present road pricing is not capable of winning a majority among motorists. In general, the stated *acceptability* of both strategies, the 'best practice second best' strategy and the one assumed as rather 'acceptable' is low. As expected, rejection is stronger regarding the stronger strategy A. But there is a significant increase of support from strategy A to strategy B. Nevertheless, the majority of respondents does not accept the so-

called 'acceptable' strategy B either. But, there are still differences between the four sites. In Dresden rejection of both strategies is very strong, which at least partly could be put down to the socialist past. Although this finding should be further examined it has to be considered when introducing road pricing in the future EU-member states of Eastern Europe. Refusal is also very strong in Como. In Oslo there is a strong rejection of strategy A but strategy B is rather accepted. In Athens the attitudes towards both strategies are generally less negative. Thus, even if a package solution with transparent revenue hypothecation receives stronger support than single pricing measures (Jones, 1991b; Keränen et al., 1999; Schade, 1999; Schlag & Teubel, 1997), the packages tested here find no majority among the motorists. However, compared to the 'strong' strategy A the acceptability of the 'weak' strategy B pricing has nearly doubled.

3.8.2 Predicting Acceptability

Multivariate statistical methods like factor and regression analyses were used to investigate the questions how the low level of acceptability for the various pricing measures can be explained and which factors influence the degree of acceptability. The analyses show that in particular the variables '*social norm*', '*perceived effectiveness*', '*personal outcome expectations*' and the '*approval of societal important aims*' are positively connected with the acceptability of pricing strategies. On the other hand the results reveal that socio-economic characteristics (e.g. income) of respondents influence the perceptions, attitudes and evaluations towards the pricing strategies only to a low extent. That means, an individuals acceptability of a pricing strategy is stronger (increases),

- the more social pressure to accept the respective strategy is perceived,
- the more personal advantages following from the introduction of the measure are expected,
- the more pricing strategies are evaluated as effective and
- the more societal important aims are approved of.

The surprising result is, that the social norm has the most predictive value of all variables. As discussed in the previous section, we assume that, if there is a lack of information and of social comparison possibilities for the evaluation of the presented strategies, an approach to own tentative ideas and valuations is to be expected. If so far only rather few norms have been perceived, the evaluating person supposes that others share his opinion. This in turn clarifies - although rather indirectly - the importance of social norms. Because if social norms were changed in a favourable way towards road pricing, a respective alignment of personal attitudes could be expected. Moreover, most of the people strive for social integration and consonance (Festinger, 1957). The pressure towards conformity exercised by relevant others is one of the strongest factors which influence personal opinions, feelings and behavioural intentions, above all in a

situation with a rather uncertain physical basis for judgement. But these influences may go into both directions, favouring or opposing pricing strategies. Today, the latter tendency is more probable.

Besides the social norm especially the *personal outcome expectations* prove to be an influential predictor of acceptability. This is not surprising, but it points out, that the advantages of the pricing packages have to be communicated in a very credible and convincing manner. Also, the evaluation of the measures' *effectiveness* predicts the acceptability of pricing strategies. No indications were found that respondents justify their rejection of the policies by claiming that they perceive them as ineffective. Thus, the hypothesis of a 'strategic response' on perceived effectiveness could not be confirmed in this survey (Rienstra et al., 1999). However, the authors recommend for future studies to check this assumption more explicitly.

Furthermore, other psychological variables like mobility-related *aims to reach* play a role when explaining pricing acceptability. But here only general, more societal aims have shown to be of importance and not personal, in a broader sense benefit-emphasizing aims.

As found in a more precise analysis, two *problem perception* patterns seems to exist (cp. Schade, 1999). The first one comprises the perception of rather directly with the road-use connected problems (congestion, lack of parking space etc.), while the second pattern refers to the perception of rather indirect traffic problems and environmental problems resulting from traffic (e.g. air pollution, noise). Surprisingly a rather contrary effect of the perception of direct traffic problems on the acceptability of pricing strategies have been detected, whereas for the environmental problem awareness no or a more positive effect could be shown. Only cautious assumptions may be put up for the causes of the different patterns of problem perception. It seems plausible that the problem perception is influenced by individual objectives concerning mobility. This is confirmed by the data: persons who evaluate personal mobility-relevant aims as important perceive traffic related problems more often, while persons who rate societal aims as important rather perceive environmental problems. The rather moderate influence of problem awareness on the acceptability of pricing strategies may be explained with the existence of another, mediating variable. If - for instance - a road user attributes congestion to inefficient traffic light sequences he would not consider road pricing strategies but rather of technology-based changes. Kals (1996) describes this variable as 'attribution of *cause* for the perceived problems'. The one who recognizes an own responsibility for the causation of the perceived problems will also take some responsibility for the solution of the problems. This confession of responsibility for the causes is clearly related to the own behaviour, and it could increase the likelihood to accept behaviour-changing measures. However, the one who *internally attributes the responsibility* for the *solution* of the perceived problems, i.e. the one who includes himself, shows a higher

acceptability of the strategies. In the contrary, external attribution (e.g. public entities) has no effect on acceptability.

But the data also reveal that possibly important influences on acceptability have not been considered so far. Influences like emotions (e.g. anger, rage), mobility-concerning equity considerations beyond pure cost-benefit-calculations, or a lack of credibility of - for instance - the proclaimed aims or of the use of revenues are to be taken into account.

Of special practical interest is the finding that, despite the high problem awareness most respondents have only little knowledge of the various TDM-strategies for the improvement of the traffic situation. If road pricing strategies are unknown, an appropriate effectiveness-evaluation or weighing-up of costs and benefits by the motorists cannot be expected. Without the knowledge and the understanding of the problem situation and the aims, an approval of the introduction of road pricing cannot be expected. Therefore the problem-background has to be made clear. For instance, the real costs of mobility ('external costs') must be disclosed, but also the causes of the problems by car-traffic have to be pointed out. Only when the car drivers at least partly see their responsibility for the problems, there is a possibility that they consider strategies which influence their mobility-behaviour as resolving options. Furthermore, the intended and with road pricing reachable aims (environmental aims, reduction of congestion etc.) have to be elucidated. The general and personal objectives of the road-users are to be taken into account, here, and possibly to be integrated in the concept.

4 Political Acceptability

4.1 Introduction

Besides the views and intentions of the persons affected by the measure (public acceptability), also the ones of the relevant political agencies as another key group have to be taken into account. The viewpoints of the national politicians are usually to ascertain through their stated policy and operational programmes. But (marginal) road pricing schemes have to be adapted to the specific local situation. Therefore the opinions and the acceptability on the local political level is of great importance for the implementation of specific measures.

But until now only very few studies have examined the political decision process in the traffic sector. Rienstra et al. (1999) cite Seale (1993) who investigated London politicians' attitudes towards road pricing, and found that there is a positive correlation between the politicians' knowledge of the concept and their support for road pricing. In the EU-project TransPrice (Keränen et al., 1999, p. 5) the conclusion is drawn that the lack of political willingness to implement pricing measures stems from a perceived low acceptability of the electorate for such measures. However, it exists a lack of systematic studies about the political acceptability of road pricing.

Generally, political decisions are made in the focus of different societal groups. Figure 4.1-1 gives a static perspective of the relationship between the different actors. It can be assumed that in reality a very complex and dynamic interaction between the stakeholders takes place.

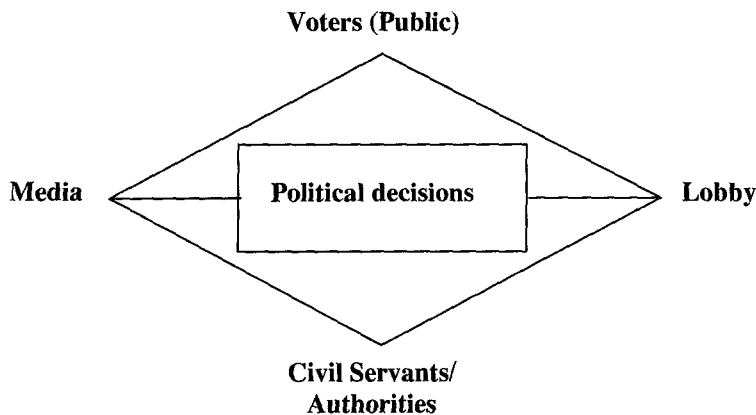


Figure 4.4.1-1: Political decisions (based on PRIMA, 1998).

Within the scope of AFFORD it is not feasible to consider the whole political decision-making process of introducing and implementing road pricing in detail. However, the opinions and attitudes of local politicians towards road pricing schemes are an essential prerequisite for the investigation of acceptability. The political acceptability survey focuses on two important points:

- (i) The politicians attitudes towards road pricing. This comprises the central constructs of the acceptability model (Schlag & Teubel, 1997) e.g. problem awareness, perceived effectiveness, acceptability and expectations.
- (ii) The politicians' perception of the public acceptability. Recent studies have reported (e.g. Jones, 1995; Keränen et al., 1999) that the views of politicians and the views of the public concerning the necessity and the effectiveness of restrictive measures agree in many points. But politicians' perception is that the public votes much more 'pro-car' than is the case. For instance, in the UITP/EC-survey (Schlag & Teubel, 1997) 85% of adults gave priority to public transport over the car, the estimate of the decision-makers was only half of this level (43%). It is to be assumed that this gap has important effects on the decision-making process.

According to the theory of planned behaviour (Ajzen, 1988, 1991) the politicians' perceptions of the public opinion can be interpreted as a subjective (or social) norm. This is the perceived social pressure, and means that the more the public is perceived to be in favour of a presented pricing strategy, the stronger the politicians' willingness to accept the strategy should be. However, a 'strategic response' on acceptability may occur when politicians try to justify their rejection of pricing strategies by reporting that they perceive the public as being against road pricing. Perhaps politicians who perceive stronger resistance against proposed measures than is the case, refrain from introducing these measures and even from being involved in the discussion about them. Thus a taboo develops based on misperceptions of the public's expectations and problems. To solve this, one first step must than be to communicate the true perceptions and opinions of people to the decision makers and thus to introduce a more thorough discussion.

Different questions have been addressed in the AFFORD political acceptability survey:

- (i) What kind of traffic problems are perceived by the political decision-makers?
- (ii) How do they rank traffic problems in comparison to other municipal problems?
- (iii) How do they evaluate different DM-schemes?
- (iv) Do the politicians see the necessity for traffic reductions?
- (v) The politicians' acceptability of the three AFFORD pricing strategies,
- (vi) The politicians' perception of public viewpoints (e.g. problem awareness, traffic reduction, acceptability),
- (vii) General evaluations of political decisions.

Because of the small sample size the analysis will be descriptive.

4.2 Survey Method

The political acceptability survey was carried out as a phone survey in spring 1999. Based on the developed questionnaire (see appendix) personal interviews with the politicians were performed. It was aimed to interview 5 to 10 politicians in the cities of Como and Dresden respectively. The interviewees had to be member of one of the major local parties who act in the city council. The persons interviewed should be experienced in traffic issues.

4.3 Results

4.3.1 Sample description

Como sample

All six interviewed politicians are male. The mean age is 48 years by a standard deviation of 11.73 years. Table 4.3-1 shows the party membership of the respondents.

Dresden sample

Seven of the politicians interviewed are male and one is female. The mean age of the sample is 44.38 years by a standard deviation of 13.52 years.

Table 4.3-1: Membership of party.

Como		Dresden	
Political party	N	Political party	N
DS - Democratici di Sinistra	1	CDU - Christlich Demokratische Union Deutschlands	1
FI - Forza Italia (one of the politicians is the Assessor Chief of the Transport Department)	2	SPD - Sozialdemokratische Partei Deutschlands	2
PPI - Partito Popolare Italiano	1	Bündnis 90 / Die Grünen	1
PRC - Partito della Rifondazione Comunista	1	FDP - Freiheitlich Demokratische Partei Deutschlands	1
DemC. - Democratici di Centro	1	PDS - Partei des demokratischen Sozialismus	2
		others	1

The main mode of the transport the politicians use to work is shown in table 4.3-2.

Table 4.3-2: Main mode of transport to work.

Main mode of transport to work	Como (N)	Dresden (N)
car	4	4
public transport	-	3
walk	2	-
missing	-	1

4.3.2 Politicians own perceptions of problems and their perceptions of public viewpoints

Table 4.3-3 shows that politicians in Como as well as in Dresden consider their traffic-related problem awareness to be different from the public's problem awareness. All six interviewed Como politicians rate public transport as a problem, followed by congestion and air pollution - each rated as a problem by five interviewees. Only two politicians regard road safety as a problem. For air pollution and traffic noise the politicians consider the public problem awareness as being equally high as their own problem awareness. For public transport one politician states a lower public problem perception than his own, whereas for all the other traffic-related problems the public problem perception is rated higher - mostly by one but for parking by two politicians.

In Dresden the politicians' traffic related problem perception is very diverse. Only congestion and traffic noise are seen as problems by all interviewed politicians. It is noticeable that except for parking and for public transport, for which they rate the public problem perception as equally high as their own, the interviewees always consider the public perception to be lower than the own problem awareness.

Table 4.3-3: Rated as a problem by N politicians.

Point of view:	Como		Dresden	
	Politicians' perception of traffic related problems	Guess about public traffic related problem perception	Politicians' perception of traffic related problems	Guess about public traffic related problem perception
Congestion	5	6	8	7
Parking	4	6	5	5
Public transport	6	5	3	3
Air pollution	5	5	6	2
Traffic noise	4	4	8	4
Road safety	2	3	4	2

Of special interest is the finding that the Dresden politicians do not regard the public to perceive air pollution as a problem although 73% of the asked motorists perceive air pollution as a major problem (see tab. 3.6-15). It can be assumed that the problem perception of the whole public (and not only the motorists) is even higher.

As shown in table 4.3-4 several political problems are of different importance for the Como and Dresden politicians. While for the Como politicians traffic and security problems are most urgent to be solved, it is unemployment and city development for the Dresden politicians. But traffic problems are also very important in Dresden.

Table 4.3-4: Ranking of problems.

Item	Como median	Dresden median
Traffic problems	1.0	4.0
Security	2.0	7.0
Unemployment	4.0	1.0
Economic growth	4.0	4.5
Environmental problems	4.0	4.5
Cultural and educational policy	5.5	6.0
City development (e.g. housing etc.)	6.0	3.0
City finances	6.0	5.0

All interviewed Como politicians and five of the eight interviewed Dresden politicians agree a future traffic restriction. The public opinion on traffic restriction is again rated slightly lower than their own opinion (see tab. 4.3-5).

Table 4.3-5: Number of politicians who agree traffic restriction.

Point of view	Como N	Dresden N
Politicians	6	5
Perception of public opinions	5	4

4.3.3 Politicians attitudes and evaluations with regard to the three packages

Evaluation of Strategy A 'Best practice second best'

In Como the opinions about the effectiveness of strategy A are very diverse, whereas in Dresden the majority of the interviewed politicians perceives strategy A as very effective (tab. 4.3-6). This indicates that the evaluation of the effectiveness is done by politicians who are experienced in traffic issues.

Table 4.3-6: *Perceived effectiveness of strategy A (frequency distribution).*

	will not work at all	will have little effect	will have some effect	will work very effectively
<i>Como</i>	2	1	1	2
<i>Dresden</i>	0	2	1	5

In tendency the measure is rather rejected in the two cities, although the rejection is not as high as expected (tab. 4.3-7). So, three Dresden politicians could accept strategy A.

Table 4.3-7: *Acceptability of strategy A (frequency distribution).*

	absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
<i>Como</i>	3	2	1	-
<i>Dresden</i>	2	3	2	1

The expectation concerning the car drivers' acceptability is unanimous. Most interviewed politicians in Como and all Dresden politicians expect at most 20% of the car drivers - if not less - to accept measure A. This is consistent with the results of the Public Acceptability survey, for in Como 15% of the interviewed car drivers and in Dresden 17% accepted strategy A.

Table 4.3-8: *Expectation about car drivers to accept strategy A (frequency distribution).*

	0 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
<i>Como</i>	4	-	2	-	-
<i>Dresden</i>	8	-	-	-	-

Table 4.3-9 reports about the extent which the public (which in this case, besides the car drivers, includes also all other people) have to accept strategy A, so that a positive political decision for this strategy can be made. In Como the necessary percentage is seen very diverse but in general only a low percentage of the public has to accept the strategy for a positive political decision. In Dresden the majority of the interviewed politicians is the opinion that at least 50% of the public should have to accept strategy A.

Table 4.3-9: *Rated necessary percentage of the public to accept strategy A as a basis for a political decision pro strategy A (frequency distribution).*

	more than 75%	more than 50%	more than 25%	of no influence
<i>Como</i>	1	1	2	2
<i>Dresden</i>	-	6	2	-

Evaluation of Strategy B 'Acceptable'

In Como strategy B is perceived as clearly more effective than strategy A (tab. 4.3-10). Therefore, for the politicians as well as for the car drivers it is found that the objectively less effective strategy B is evaluated as more effective than the actual more effective strategy A. This is not the case in Dresden, because the politicians here perceive strategy B to be less effective than strategy A. Notwithstanding, the Dresden politicians perceive strategy B as rather effective. However, the asked car drivers of the Dresden sample did not perceive any differences in effectiveness between the two strategies A and B.

Table 4.3-10: Perceived effectiveness of strategy B (frequency distribution).

	will not work at all	will have little effect	will have some effect	will work very effectively
Como	-	1	4	1
Dresden	-	2	5	1

The extent of perceived effectiveness also shows in the acceptability-scores, especially for Dresden. There the majority of the politicians interviewed consider strategy B as rather acceptable.

Table 4.3-11: Acceptability of strategy B (frequency distribution).

	absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
Como	1	3	2	-
Dresden	2	-	5	1

That is why the rating of the assumed car drivers' acceptability for strategy B is also slightly higher, though - especially in Dresden - it is underestimated by the politicians. In the public acceptability survey an acceptability-level of 31% in Dresden and of 34% in Como accept revealed.

Table 4.3-12: Expectation about car drivers accepting strategy B (frequency distribution).

	0 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Como	2	2	2	-	-
Dresden	6	2	-	-	-

In Como only one politician thinks that for political pro-strategy-B decision more than 50% of public should support the strategy. The others are the opinion that less support is sufficient, or that public support has no influence on the decision. In Dresden - in the contrary - the opinion remains that more than 50% of the public should accept strategy B, so that a positive political decision for this strategy could be made.

Table 4.3-13: Rated necessary percentage of the public to accept strategy B as a basis for a political decision pro strategy B (frequency distribution).

	more than 75%	more than 50%	more than 25%	of no influence
Como	-	1	2	3
Dresden	-	7	1	-

Evaluation of Strategy C 'Site specific'

Because in Como and Dresden different site specific strategies were evaluated, the data for the two cities cannot be compared.

The site specific strategy in Como comprises mainly the implementation of an access restriction with a parallel improvement of parking facilities. In Dresden the building of a bridge shall be financed with the imposition of tolls for its crossing. The exact description of the site specific strategies can be found in sections 3.5.2 and 3.5.3.

In Como the effectiveness-evaluation for the site specific strategy is rather positive, but in Dresden rather negative (tab. 4.3-14). However, there are also positive judgements for this strategy.

Table 4.3-14: Perceived effectiveness of strategy C (frequency distribution).

	will not work at all	will have little effect	will have some effect	will work very effectively
Como	-	1	4	1
Dresden	2	3	2	1

In Como the site specific strategy is unanimously rather accepted by the politicians. This can be put down to the experience with access restrictions already gained in Como (e.g. in the EU-project TransPrice). In Dresden the site specific strategy is seen controversial by the politicians. Three do not accept the strategy at all whereas also three politicians could rather accept this measure. Summed up, in Dresden the overall political acceptability of the site specific strategy is rather low.

Table 4.3-15: Acceptability of strategy C (frequency distribution).

	absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
Como	-	-	6	-
Dresden	3	1	3	1

The car drivers' acceptability for the site specific strategy is mostly estimated at 40% in Como, but one politician rates it at more than 60% (tab. 4.3-16). In the whole the majority of the Como politicians underestimate the real level of car

drivers' support of 54%. In Dresden the real proportion of 21% of car drivers' acceptability is estimated quite well.

Table 4.3-16: Expectation about car drivers to accept strategy C (frequency distribution).

	0 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Como	-	4	1	1	-
Dresden	7	1	-	-	-

While in Dresden the ratings for the necessary level of public acceptability have not changed, five of the six Como politicians state that only more than 25% of the public would have to support the site specific strategy for making a positive political decision possible (tab. 4.3-17).

Table 4.3-17: Rated necessary Percentage of the public to accept strategy C as a basis for a political decision pro strategy C (frequency distribution).

	more than 75%	more than 50%	more than 25%	of no influence
Como	-	1	5	-
Dresden	-	6	2	-

Finally the politicians' expectation concerning the future development of car costs shall be reported in table 4.3-18. In general, the politicians consider car driving to become more expensive in the future.

Table 4.3-18: Will car driving become more expensive? (frequency distribution).

	no, not at all	probably no	probably yes	almost certainly yes
Como	-	-	3	3
Dresden	-	1	2	5

4.3.4 General evaluations of political decisions

The above reported results may be viewed against the background of the evaluation concerning the general influence of different groups on local political decisions.

In Dresden the media are seen as the most influential group for political decisions. This indicates that the influence of the media on the acceptability of road pricing has not sufficiently been considered, yet. The influence of the voters as well as of the political parties is also rated high in Dresden, whereas only medium influence is attributed to the lobby groups and to the local business community.

Table 4.3-19: Evaluation of the general influence of different groups on local political decisions.

Groups	Como median	Dresden median
Media	3.5	2.0
Public / Voters	4.0	3.0
Political parties	4.0	3.5
Lobby	2.0	4.5
Local business	1.0	5.0
Civil servants / Authorities	7.0	6.0
Friends / families of politicians	6.0	7.0

In Como the local business community is seen as the most influential group. Great influence is also attributed to lobby groups, while the media, the public/voters, and also the political parties are considered to have only medium influence.

In Como as in Dresden the lowest influence on political decisions is attributed to the authorities and to the friends/families of the politicians.

Cross tables show that politicians who rate the general influence of the public/voters rather low also rate the public level of support necessary for a pro pricing decision rather low. However, on the basis of the small sample this result is only to be seen as a preliminary hint.

4.4 Summary and Discussion

Because of the very small sample only very careful conclusions can be drawn; especially in Como, as there only six politicians agreed to be interviewed.

Perceptions

Generally it is found that the politicians' personal traffic related problem perception is rather high. Thus, it does not substantially differ from the car drivers' problem perception. While for Como no clear statements can be made, for the Dresden politicians it can be said that they underestimate the public problem perception. This especially refers to air pollution. However, for traffic related problems like congestion and parking the perceptions correspond rather well.

Compared to other municipal problems, traffic problems are generally given high priority. This particularly holds for Como. In Dresden other problems like unemployment or city development, which result from the special political situation (German reunification), still overweigh the present traffic problems.

In general the majority of the interviewed politicians agrees a reduction of inner city traffic.

Evaluations

Both the politicians' evaluation of the effectiveness and their personal acceptability of the presented strategies is surprisingly positive. Although strategy A is still mainly rejected, the majority of interviewed politicians considers strategy B, which also contains cordon pricing, as at least rather acceptable. So, the politicians' acceptability of pricing policies is higher than expected. In the contrary, especially in Dresden, the public's acceptability is clearly underestimated. This - as experience shows - should be higher than the 31% acceptability as shown by the motorists in the public acceptability survey.

In a current statement the institution 'Deutscher Städtetag', which is a lobby for German cities, has rejected the introduction of road tolls in cities as a suitable instrument for coping with urban traffic problems (Der Städtetag, 1999, p. 7). Especially the involved negative effects on city development would be a reason against road tolls. Instead of this it is proposed that for influencing and financing traffic already existing instruments should be used more intensively before new taxes would be introduced. Above all, the 'Deutsche Städtetag' fears immense shifts of traffic towards the toll-free roads in the city-outskirts, and - as a consequence - negative effects on the local economy (retail trade).

Considering the findings that an acceptability level of ca. 50% of the public is seen as necessary for a positive political decision, the introduction of a measure like strategy B does not seem so unrealistic anymore. However, besides the voters also other groups show to have a substantial influence on political decisions, and thus are able to hinder the introduction of pricing policies. Especially the influence of the media in relation to the (lacking) acceptability of road pricing has not sufficiently been considered yet.

5 How to Enhance the Acceptability of Urban Transport Pricing?

There are no simple solutions for obtaining acceptability for road pricing measures. However, based on this survey findings at least some general rules should be considered in order to make an implementation of a transport pricing measure more likely. (cp. Schlag & Teubel, 1997; Schlag & Schade, 2000). More specific a communication strategy as one of the main pillars of the introduction procedure should to be designed which “sell” the measures. Furthermore, some communication principles shall be presented.

5.1 General Rules

The objectives of the pricing strategy have to meet **main public concerns**. Politicians and the public regard traffic problems in cities as a very important and urgent issue. There is a search for solutions. Thus, marginal cost pricing should give rise to environmental benefits and congestion reduction (and these have to be communicated), safety contributions and other advantages should be perceived and it should meet positive social norms (Goodwin, 1989). A number of guidelines to successful implementation can, therefore, be suggested.

- Pricing strategies have to be perceived as very **effective solutions**, if not as the only effective solution for the perceived traffic problems. People are used to regard public roads as “free” goods, therefore there will be strong emotional resistance to any attempt to charge for them. If you want people to accept charging for road use or parking there must be very good and convincing reasons. Perhaps the best reason is, that this is the best way of solving perceived urgent problems. The effectiveness of transport pricing may be high but this is not guaranteed and depends on the definition of objectives. The efficiency will be comparatively very high - from the cities', but not from the motorists' point of view. Thus, not only the objectives of the intended measures must be valued highly by the public, people must also believe that their behaviour contributes to reach these objectives. The values as well as the expectations (the perceived probability to reach these objectives) should be made transparent and first trials of a new behaviour must be successful so that the new behaviour is perceived as effectively contributing to reach the shared values, thus creating positive contingencies between the behaviour and its consequences.
- **Revenues** must be **hypothecated** and alternatives have to be provided. People want to get something for their money. Thus, there must be a package solution, combining traffic restraints and road charging with a set of transport and environmental improvements (cp. Jones, 1998; Schlag & Schade, 2000).

- **Fairness** issues have to be considered very carefully. The system must be perceived as fair in particular relating to the personal cost-benefit-relation. The benefits people see for themselves must balance their costs at least in an immaterial way (e.g. by reaching other valuable objectives). In addition people should not feel to be treated unjust in comparison to others. An important role plays in this context the use of the revenues. With the help of the raised charges it is possible to influence the distributional impacts in the desired direction. Hypothecation of the revenues must result in guaranteeing a desired level of mobility for all, even supporting mobility chances for some groups thus meeting equity issues on a population level (Bannister, 1994; Giuliano, 1994; Langmyhr, 1997; Schade et al., 2000)
- **Charging only new facilities** can be a rather easy way to introduce road pricing. Using road pricing only for new infrastructure has a better chance of acceptance, as there is a net benefit from the new investment.
- Public acceptability can only be expected if people have **confidence** among others in the effectiveness of the measure, the use of the revenues, the fairness and anonymity of the system. One precondition to support confidence is *transparency* of the intended measures at an early stage. Connected to transparency, for the acceptability of any change you have to create some commitment of people to the new ideas, perhaps creating some identification with the proposed package of measures. This commitment depends on early and credible communication, on positive experiences (at least by models), on the conviction that this is an effective solution, and on perceived chances of *participation*. People want to see themselves as having at least some degree of control over the things they are affected by. Thus there is a connection between participation, commitment, acceptability and later effectiveness. This points out the importance of early information and participation of people even in concept development. A second precondition for creating confidence is defined responsibility. Who will be responsible for the functioning of the system, for charging and accounting, for revenue allocation, for failures and undesired effects? This has to be defined clearly before implementing the system. Responsibility issues are of particular relevance in connection with the debate of privatisation. And finally, to meet the above requirements it is necessary to design a strategy to communicate the measures.
- The necessary publicity calls for an **intelligent communication strategy**.

5.2 Some Communication Principles

The communication strategy only works if it covers the whole package. From a psychological point of view a successful communication strategy should - among others - reflect the following principles:

- All the externalities have to be discussed in advance: creating awareness for the problem, then presenting a package of credible solutions.
- Positive objectives must be connected with most effective solutions to reach them. Thus transport pricing has to be communicated as a very effective means to reach commonly shared goals. This can make private costs more acceptable.
- There must be personally positive experiences in first trials changing the transport mode, e.g. time savings, less parking problems, ecological advantages, the possibility to participate in solving traffic problems, attraction of inner-cities etc. Positive experiences on first trials help to get used to the new behaviour. If the first experiences with a newly implemented system have to be positive to hold them, then investments in public transport must go ahead before pricing is introduced to reduce painful first experiences and to have the capacities available.
- The communication has to point out the positive sides of the package, ie the uses for which the road charges are used. This connection between push and pull - measures (see hypothecation) was not given in a sufficient way in former road pricing strategies (e.g. in Stuttgart, Germany) or it was not communicated transparently enough. (FAW, 1995).
- People must feel to have a choice, even if the choice alternatives are restricted and the inputs of their decisions have changed. If they only feel to be forced to compliance, some of them will show reluctance, a strong motive to change the situation for themselves and to restore former perceived possibilities to choose between alternatives. Crucial is the *perceived freedom of choice* (Weiner, 1993).
- If you can not convince people, external control to enforce the desired measures has to be very strong. But this external control will only work if a great majority of people generally agree with the measures and accept that people offending against these measures are enforced and punished. This will certainly work if no more than 20 or 30 per cent of all the people targeted oppose the measure. Thus you have to convince a great majority of road users and even of car drivers. The conviction of a great majority is not only a precondition for the acceptance of the measure, but also a precondition for the acceptance of the control against offenders.
- In addition positive information should be disseminated which corresponds with the desired attitudes and behaviour and negative information for undesired.
- Achieving changes in normative values is another strong element for establishing the new behaviour. Creating new norms on a collective and new intentions on a personal level may motivate to behave in a new manner to

meet these new beliefs. But that must be experienced as valuable in a material and in an immaterial sense. Generally, the perception of the situation has to be changed - and this will influence the behaviour of people.

- The pricing scheme, and supporting measures must develop a new transport system, offering real alternatives (bus, tram, shared modes of transport), which are well known (information) and attractive in terms of price, convenience, availability and accessibility etc. Constraints to changes in behaviour must be identified and eliminated. Thereby mobility should not be diminished by transport pricing. Such a favourable situation is a precondition to break old habits and to realise new intentions. Thus positive first experiences with alternatives (in mode, time, route choice) can be understood as a learning exercise which demonstrated what can be gained from changed behaviour. In the first instance, positive expectations, positive values and positive outcomes may be partly communicated by models which explain the scheme, and get vicarious rewards.
- The pricing message has to be communicated by very credible communicators (credible from the point of view of car drivers and other users).

References

- Adams, J.S. (1965). Inequity in Social Exchange. In: L. Berkowitz (Ed.). *Advances in Experimental Social Psychology*. New York: Academic Press, 267-299.
- Ajzen, I. (1988). *Attitudes, Personality and Behavior*. Chicago: The Dorsey Press.
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Bannister, D. (1994). Equity and Acceptability in Internalising the Social Costs of Transport. In: *EMCT, Internalising the Social Costs of Transport*. Paris: EMTC, 153-175.
- Bartley, B. (1995). Mobility Impacts, Reactions and Opinions. Traffic demand management options in Europe: The MIRO Project. *Traffic Engineering and Control*, 36, 596-603.
- Bell, P.A., Fisher, J.D., Baum, A. & Greene, T.C. (1990). *Environmental Psychology*. Fort Worth: Harcourt Brace Jovanovich College Publishers.
- Brehm, J.W. (1966). *A Theory of Psychological Reactance*. New York: Academic Press.
- Button, K.J. & Verhoef, E.T. (1998). *Road Pricing, Traffic Congestion And The Environment. Issues of Efficiency and Social Feasibility*. Cheltenham: Edward Elgar Publishing.
- Commission of the European Communities (1995). *Towards Fair and Efficient Pricing in Transport: Policy Options for Internalising the External Costs of Transport in the European Union*. Green Paper, Brussels.
- Deutscher Städtetag (1999). Städte wollen Zentren von Verkehr entlasten: City-Maut bringt keine Entlastung. *Der Städtetag*, 7, 6-7.
- Eagly, A.H. & Chaiken, S. (1993). *The Psychology of Attitudes*. San Diego, CA: Harcourt Brace Jovanovich.
- Ernst, A. & Spada, H. (1993). Bis zum bitteren Ende?. In: J. Schahn & T. Giesinger (Hrsg.). *Psychologie für den Umweltschutz*. Weinheim: PVU, 17-28.
- FAW - Forschungsinstitut für Anwendungsorientierte Wissensverarbeitung (1995). *MobilPass-Feldversuch*. Dokumentation im Auftrag des Verkehrsministeriums Baden- Württemberg, Stuttgart.
- Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations*, 7, 117-140.

- Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press.
- Fishbein, M. & Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: an Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Franzen, A. (1997). *Umweltbewußtsein und Verkehrsverhalten*. Chur: Rüegger.
- Frey, B.S. & Pommerehne, W.W. (1993). On the Fairness of Pricing - An Empirical Survey among the General Population. *Journal of Economic Behavior and Organization*, 20, 295-307.
- Goodwin, P.B. (1989). The 'Rule of Three': A Possible Solution to the Political Problem of Competing Objectives for Road Pricing. *Traffic Engineering + Control*, 39, 495-497.
- Giuliano, G. (1994). Equity and Fairness Considerations of Congestion Pricing. In *Curbing Gridlock*, Vol. 2, National Research Council. Special report 242, 250-279, Washington D.C.
- Hays, L. W. (1994). *Statistics*. Fort Worth: Harcourt Brace College Publishers.
- Homburg, A. & Matthies, E. (1998). *Umweltpsychologie: Umweltkrise, Gesellschaft und Individuum*. Weinheim: Juventa.
- Hornby, A.S. & Growther, J. (1995). *Oxford Advanced Learners' Dictionary of Current English*. Berlin: Cornelsen and Oxford University Press.
- Jones, P.M. (1991a). UK Public Attitudes to Urban Traffic Problems and Possible Countermeasures: a Poll of Polls. *Environment and Planning C: Government and Policy*, 9, 245-256.
- Jones, P.M. (1991b). Gaining Public Support for Road Pricing through a Package Approach. *Traffic Engineering + Control*, 4, 194-196.
- Jones, P.M. (1995). Road Pricing: The Public Viewpoint. In: B. Johansson & L.G. Mattson (Eds.). *Road Pricing: Theory, Empirical Assessment and Policy*. Boston: Kluwer, 159-180.
- Jones, P.M. (1998). Urban Road Pricing: Public Acceptability and Barriers to Implementation. In: K.J. Button & E.T. Verhoef (Eds.). *Road Pricing, Traffic Congestion And The Environment. Issues of Efficiency and Social Feasibility*. Cheltenham: Edward Elgar Publishing, 263-284.
- Kals, E. (1996a). *Verantwortliches Umweltverhalten*. Weinheim: PVU.
- Kals, E. (1996b). Are Pro-environmental Commitments Motivated by Health Concerns or by Perceived Justice?. In: L. Montada & M. Lerner (Eds.). *Current Societal Concerns about Justice*. New York: Plenum Press, 231-258.

- Keränen, M., Schade, J., Schlag, B. & Vougioukas, M. (1999). *Public Acceptability*. TransPrice Deliverable 6, Report to EC, DG VII. Helsinki, Dresden, London.
- Keuchel, S. (1992). Internationale Erfahrungen mit Straßenbenutzungsgebühren im Stadtverkehr. *Internationales Verkehrswesen*, 44, 377-386.
- Langmyhr, T. (1997). Managing equity: The case of road pricing. *Transport Reviews*, Vol. 4 (1), p.25-39.
- Lerner, M.J. (1975). The Justice Motive in Social Behavior. *Journal of Personality*, 45, 1-52.
- Leung, K. & Lind, E.A. (1986). Procedural Justice and Culture: Effects of Culture, Gender, and Investigator Status on Procedural Preferences. *Journal of Personality and Social Psychology*, 50, 1134-1140.
- Lucke, D. (1995). *Akzeptanz. Legitimität in der „Abstimmungsgesellschaft“*. Opladen: Leske+Budrich.
- Luk, J. & Chung, E. (1997). *Public Acceptance and Technologies for Road Pricing*. ARRB Transport Research Ltd., Research Report No. 307, Vermont South.
- Milne D., Niskanen E. & Verhoef E. (2000): *Operationalisation of Marginal Cost Pricing within Urban Transport*. Project AFFORD, funded by the European Commission, 4th Framework – Transport RTD. VATT Research Reports No 63. Helsinki.
- MIRO (1995). *MIRO Final Report*. Deliverable 8 to Commission of the European Communities, DG XIII DRIVE Programme. Brussels.
- Norwegian Public Roads Administration et al. (1999). *Bompengeringen. Holdningsundersøkelse 1989-1998*. PROSAM report. 59, Oslo.
- OECD (1997). *Environmental Taxes and Green Tax Reform*. Paris: OECD Publications.
- Pligt, J. (1995). Social Psychology and Environmental Issues. In: G. Semin & K. Fiedler (Eds.). *Applied Social Psychology*. London: Sage Publications, 173-197.
- PRIMA (1998). *Technical Annex, part 2*. Description of the PRIMA project (Project no: 98-3020).
- Rawls, J. (1971). *A Theory of Justice*. London: Oxford University Press.
- Rienstra, S. A., Rietveld, P. & Verhoef, E. T. (1999). The Social Support for Policy Measures in Passenger Transport. A statistical analysis for the Netherlands. *Transportation Research Part D*, 4, 181-200.

- Rogers, R.W. (1983). Cognitive and Psychological Processes in Fear Appeals and Attitude Change: A Revised Theory of Protection Motivation. In: J.T. Cacioppo & R.E. Petty (Eds.). *Social Psychophysiology: A Sourcebook*. New York: Guilford Press, 153-176.
- Schade, J. (1999). Individuelle Akzeptanz von Straßenbenutzungsentgelten. In: B. Schlag (Hrsg.). *Empirische Verkehrspsychologie*. Lengerich: Pabst Science Publishers. 227-244.
- Schade J., Schlag B., Giannouli I. & Beier A. (2000): *Acceptability of Marginal Cost Road Pricing*. Deliverable 2C, Project AFFORD, funded by the European Commission, 4th Framework – Transport RTD. Technische Universität Dresden.
- Schahn, J. (1993). Die Kluft zwischen Einstellung und Verhalten beim individuellen Umweltschutz. In: J. Schahn & T. Giesinger (Hrsg.). *Psychologie für den Umweltschutz*. Weinheim: PVU, 29-50.
- Schlag, B. (1997). Road pricing-Maßnahmen und ihre Akzeptanz. In: B. Schlag (Hrsg.). *Fortschritte der Verkehrspsychologie 1996*. Bonn: Deutscher Psychologen Verlag, 217-224.
- Schlag, B. (1998). Zur Akzeptanz von Straßenbenutzungsgebühren. *Internationales Verkehrswesen*, 50, 308-312.
- Schlag, B. & Schade, J. (2000). Public acceptability of traffic demand management in Europe. *Traffic Engineering + Control*. Sept. 2000, Vol 41, No 8, p. 314-318.
- Schlag, B. & Teubel, U. (1997). Public Acceptability of Transport Pricing. *IATSS Research*, 21, 134-142.
- Schwartz, S.H. (1970). Moral Decision Making and Behavior. In: J. Macaulay & L. Berkowitz (Eds.). *Altruism and Helping Behavior*. New York: Academic Press, 221-279.
- Seale, K. (1993). Attitudes of Politicians in London to Road Pricing. *Proceedings of Seminar F of the PTRC 21st Summer Annual Meeting*, 117-128.
- Steg, L. & Vlek, C. (1997). The Role of Problem Awareness in Willingness-to-Change Car-Use and in Evaluating Relevant Policy Measures. In: T. Rothengatter & E.C. Vaya (Eds.). *Traffic and Transport Psychology*. Amsterdam: Pergamon. 465-475.
- SPARTACUS (1998). Final Report to the European Commission.
- Teubel, K. (1997). Verteilungswirkungen von Straßenbenutzungsgebühren in einem städtischen Ballungsraum. *Internationales Verkehrswesen*, 49, 97-103.

- TransPrice (2000). Final Report and Summary. *Deliverable 9 to Commission of the European Communities*, DG VII, London.
- Van der Laan, J.D. (1998). *Acceptance of Automatic Violation-Registration Systems*. PhD-Thesis, University of Groningen, The Netherlands.
- Vierth, I. & Göthlin, L. (1995). *MIRO – DRIVE II: Attitudes to Demand Management Strategies. Local Results for Göteborg*. Stockholm: TFK – Transport Research Institute.
- Walster, E., Walster, G.W. & Berscheid, E. (1978). *Equity: Theory and Research*. Boston: Allyn and Bacon.
- Weiner, B. (1992). *Human Motivation: Metaphors, Theories, and Research*. Newbury Park: Sage Publications.

Appendix A: Public Acceptability Questionnaire

Good Morning/Afternoon

We are carrying out a survey about transport and traffic issues inas part of a research project for the European Commission. Your name came up in a random drawing. Your help would be very valuable for the success of this research-project.

The project is investigating public attitudes to potential transport policies in four European Cities: Athens (Greece), Como (Italy), Dresden (Germany) and Oslo (Norway). By answering this questionnaire you help us to make sure that all pertinent viewpoints get a fair representation in the research.

Your answers will be treated with utmost confidentiality. The collected data will be used for research purposes only, no single respondent can be identified from the results.

If you have any questions about this survey, or the AFFORD project in general please contact ...

Internet: <http://www.vatt.fi/afford/>

1. What do you think about **transport problems** in Oslo? In the white cells, we ask you to evaluate the various items as **general** problems (for the society as a whole). In the grey cells we want you to state whether you are **personally** affected by the problem or not.

	not a general problem at all	a minor general problem	a major general problem	a very serious general problem	I am <i>not</i> personally affected	I am personally affected
• Traffic jam	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Not enough parking spaces	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Inadequate public transport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Air pollution from motor vehicles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Traffic noise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Unsafe roads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Do you think these problems become better or worse or stay the same in over the **next 5 years**?

	getting worse	stay the same	getting better
• Traffic jam	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Not enough parking spaces	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Inadequate public transport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Air pollution from motor vehicles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Traffic noise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• Unsafe roads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Do you personally think there is a need to *limit the amount of traffic* in ... or do you think there is no need for a limit?

no, not at all	not really	to some extent	certainly
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Who is responsible for resolving the transport problems in Oslo?

	certainly no responsibility	little responsibility	some responsibility	large responsibility
• the motorists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• the municipality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• the state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• the scientists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• you (yourself)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• the business community (e.g. trade, shops, shopping malls)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• the automobile association	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• the public transport companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• others:				

5. Please tell us which of your *mobility interests* are important for you and which are less important.

	unimportant	less important	rather important	very important
I want to use my car whenever I like.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The air in <i>Oslo</i> should become better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to go by car to every place I want.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travelling should be cheap.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
All should be treated equal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to be by myself if I go by car.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The city centre should be pedestrianised	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There should be more bicycle routes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Traffic safety should be improved.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to go to every place I want (in the city) no matter which transport mode (bus, tram, bicycle etc.) I use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

There exists different ways to improve the traffic situation in Oslo. We now present three possible strategies. Please, answer a few questions related to each of these strategies.

Strategy A

<p>"Charge motorists</p> <ul style="list-style-type: none"> • <i>toll cordon with charges of 2 euro during the morning peak (7.00 - 9.00 a.m.) and 0.5 euro thereafter</i> • <i>parking charges increased with 0.5 euro/hr</i> • <i>fuel taxes increased with 0.5 euro/litre</i> <p style="text-align: center;">and use the revenues:</p> <ul style="list-style-type: none"> • <i>two thirds to lower labour taxes</i> • <i>one third to invest in capacity expansion of known road traffic bottlenecks"</i>
--

6. Have you heard of the above mentioned strategy before?

nothing at all	little	somewhat	a lot
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. How effective do you think this strategy will be in reducing the amount of traffic in the city centre of Athens/Como/Dresden?

will work very effectively	will have some effect	will have little effect	will not work at all
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. How acceptable would you say that this strategy would be for the city of Athens/ Como/ Dresden?

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Compared to the present situation and all things considered, do you think this would be,

<input type="radio"/> to your advantage	<input type="radio"/> to your disadvantage	<input type="radio"/> of no importance to you.
---	--	--

10. Do you think that your closest (family, friends) would think that you should accept the strategy?

very likely	rather likely	rather unlikely	very unlikely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. If the above mentioned policy strategy would be introduced how would this affect your travel-behaviour?

<i>I would</i>	certainly not	probably not	probably yes	absolutely certain
• drive less	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• use public transport more often	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• use my bicycle more or walk more.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• pay the tolls and drive as before	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• not drive tolled (charged) routes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• take part/join in car-sharing or car-pooling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• not drive at tolled (charged) times or less tolled times	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• support a movement to stop the strategy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
• use park & ride more often	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Strategy B

“Charge motorists

- *toll cordon charges of 1 euro at all times (including nights and weekends)*
- *parking charges increased with 0.25 euro/hr*
- *fuel taxes increased with 0.125 euro/litre*

and use the revenues:

- *one third to lower fixed vehicle taxes*
- *one third to invest in capacity expansion of known road traffic bottlenecks and/or to improve parking facilities*
- *one third to improve the quality of public transport’*

12. Have you heard of the this strategy before?

a lot	somewhat	little	nothing at all
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. How effective do you think this strategy will be in reducing the amount of traffic in the city centre of Athens/Como/Dresden etc.?

will not work at all	will have little effect	will have some effect	will work very effectively
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Strategy C

SITE SPECIFIC STRATEGY (ATHENS COMO DRESDEN OSLO)
--

18. Have you heard of this strategy before?

nothing at all	little	somewhat	a lot
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. How effective do you think this strategy will be in reducing the amount of traffic in the city centre of Athens/Como/Dresden?

will work very effectively	will have some effect	will have little effect	will not work at all
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. How acceptable would you say that this strategy would be for the city of Athens/Como/Dresden?

absolutely acceptable	rather acceptable	rather unacceptable	totally unacceptable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. Compared to the present situation and all things considered, do you think this would be,

<input type="radio"/> to your advantage	<input type="radio"/> to your disadvantage	<input type="radio"/> of no importance to you.
---	--	--

22. Do you think that your closest (family, friends) would think that you should accept the strategy?

very likely	rather likely	rather unlikely	very unlikely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. Overall, if you had to pay more to drive your car, would you - compared to the present situation expect...?

I would expect.....

- shorter travel time to the city centre
- additional travel costs
- less environmental problems
- to have my travel possibilities unfairly restricted
- more effort to plan trips
- a nicer city centre
- to be more strongly affected than most other people by the increased cost

	certainly not	probably not	probably yes	certainly yes
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. To what extent do you agree with the following statement?

„I would find it very difficult to reduce my car trips substantially.“

strongly disagree	rather disagree	rather agree	strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Do you think that car driving in future will become considerably more expensive?

No, not at all	Probably no	Probably yes	Almost certainly yes
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. If driving became more expensive, in one of the ways mentioned above), how would this affect your use of car for different activities?

	It would not affect my use of car at all	It would have little effect	It would have some effect	It would make me drive substantially less
Your work or school journey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your shopping trip	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your leisure trip	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. You are female male

30. Your age is: _____ years

31. You live: within ... out of ...
or (postal code: _____)

32. You work or go to school: within ... out of ...
or (postal code: _____)

33. How many persons live in your household, including yourself: _____

34. How many persons in your household are 17 years old or younger: _____

35. Employment status:

- self employed
- employed (full time wage / salary earner)
- employed (part time wage / salary earner)
- student, trainee etc.
- unemployed
- pensioner
- homemaker
- other: _____

36. What is your household's gross income per month (including pension, government child benefit, unemployment, family and housing allowances, financial aid for students etc.)?

- | | | | |
|-----------------------|--------------|-------------|------------------|
| <input type="radio"/> | - | 500 or less | euro's per month |
| <input type="radio"/> | 501 - | 1,000 | euro's per month |
| <input type="radio"/> | 1,001 - | 2,000 | euro's per month |
| <input type="radio"/> | 2,001 - | 3,000 | euro's per month |
| <input type="radio"/> | 3,001 - | 4,500 | euro's per month |
| <input type="radio"/> | 4,501 - | 6,000 | euro's per month |
| <input type="radio"/> | 6,001 - | 8,000 | euro's per month |
| <input type="radio"/> | over 8,000 - | | euro's per month |

37. How many kilometres did you drive by car last year (during the last 365 days)?

_____ km / p.a.

38. Are you member in an automobile association? (e.g. yes no
ADAC, RAC)

39. How do you usually go to work/school? car
(state main mode only) public transport
 bicycle
 walk

Thank you for your co-operation.

Appendix B: Political Acceptability Questionnaire

1. What do you think about transport problems in Como? Please tell us whether you think each situation mentioned in the following is a <i>general problem</i> or not.	My opinion		2. Please indicate your guess whether the public* perceive the mentioned situations as a problem or not.	perceived by the <i>public</i> as <i>no problem</i>	perceived by the <i>public</i> as <i>a problem</i>
	not a general problem	a general problem			
Traffic jam	<input type="radio"/>	<input type="radio"/>	Traffic jam	<input type="radio"/>	<input type="radio"/>
Not enough parking spaces	<input type="radio"/>	<input type="radio"/>	Not enough parking spaces	<input type="radio"/>	<input type="radio"/>
Inadequate public transport	<input type="radio"/>	<input type="radio"/>	Inadequate public transport	<input type="radio"/>	<input type="radio"/>
Air pollution from motor vehicles	<input type="radio"/>	<input type="radio"/>	Air pollution from motor vehicles	<input type="radio"/>	<input type="radio"/>
Traffic noise	<input type="radio"/>	<input type="radio"/>	Traffic noise	<input type="radio"/>	<input type="radio"/>
Unsafe roads	<input type="radio"/>	<input type="radio"/>	Unsafe roads	<input type="radio"/>	<input type="radio"/>

*public (on request: all people of the city)

3. How important are in your opinion *traffic problems* compared to other problems in your city? Please rank from 1 to 7 (rank 1 means most important, 7 least important)

• unemployment	<input type="radio"/>
• security	<input type="radio"/>
• economic growth	<input type="radio"/>
• city development (e.g. housing etc.)	<input type="radio"/>
• cultural and educational policy	<input type="radio"/>
• city finances	<input type="radio"/>
• environmental problems	<input type="radio"/>
• traffic problems	<input type="radio"/>

4.	Do you personally think there is a need to limit the amount of traffic in ... or do you think there is no need for a limit?	<i>I personally think there is no need for limit</i>	<i>I personally think there is a need for limit</i>
		<input type="radio"/>	<input type="radio"/>
5.	Do the (majority of the) public think there is (or not) a need for a limit?	<i>public think there is no need for limit</i>	<i>public think there is a need for limit</i>
		<input type="radio"/>	<input type="radio"/>

There exist different possibilities to improve the traffic situation in Oslo. In the following three policy strategies are presented. Please answer a few questions related to each transport strategy.

Strategy A

<p>"Charge motorists</p> <ul style="list-style-type: none"> • <i>toll cordon with charges of 2 euro during the morning peak (7.00 - 9.00 a.m.) and 0.5 euro thereafter</i> • <i>parking charges increased with 0.5 euro/hr</i> • <i>fuel taxes increased with 0.5 euro/litre</i> <p style="text-align: right;">and use the revenues:</p> <ul style="list-style-type: none"> • <i>two thirds to lower labour taxes</i> • <i>one third to invest in capacity expansion of known road traffic bottlenecks"</i>

4. Think about this strategy 1 and tell me how effective you think it will be in reducing the amount of traffic in the city centre of ... etc.?

will not work at all	will have little effect	will have some effect	will work very effectively
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Thinking about strategy 1 again, could you please indicate how acceptable it is to you for the city of ...?

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. What do you think how many percent of the car drivers would accept the measure?

0-20%	21- 40%	41- 60%	61- 80%	81- 100%
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Political decisions reflect public opinion, at least to some extent. But sometimes politicians have to make unpopular decisions too. What do you personally think: As a basis for a political decision pro strategy 1, how many percent of the public must accept strategy 1?

More than 75%	More than 50%	more than 25%	of no influence
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Strategy B

“Charge motorists

- *toll cordon charges of 1 euro at all times (including nights and weekends)*
- *parking charges increased with 0.25 euro/hr*
- *fuel taxes increased with 0.125 euro/litre*

and use the revenues:

- *one third to lower fixed vehicle taxes*
- *one third to invest in capacity expansion of known road traffic bottlenecks and/or to improve parking facilities*
- *one third to improve the quality of public transport”*

8. Think about this strategy 2 and tell me how effective you think it will be in reducing the amount of traffic in the city centre of ...?

will not work at all	will have little effect	will have some effect	will work very effectively
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Thinking about strategy 2 again, could you please indicate how acceptable it is to you for the city of ...?

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. What do you think how many percent of the **car drivers** would accept the measure?

0-20%	21- 40%	41- 60%	61- 80%	81- 100%
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Political decisions reflect public opinion, at least to some extent. But sometimes politicians have to make unpopular decisions too. What do you (personally?) think: As a basis for a political decision pro strategy 1, how many percent of the **public** must accept strategy 1?

More than 75%	More than 50%	more than 25%	of no influence
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Strategy 3

Strategy 3 "Site specific strategy".

This strategy should be related to each site specific situation and has to be specified by the site leader.

12. Think about this strategy 3 and tell me how effective you think it will be in reducing the amount of traffic in the city centre of ...?

will not work at all	will have little effect	will have some effect	will work very effectively
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Thinking about strategy 3 again, could you please indicate how acceptable it is to you for the city of ...?

absolutely unacceptable	rather unacceptable	rather acceptable	totally acceptable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. What do you think how many percent of the **car drivers** would accept the measure?

0-20%	21- 40%	41- 60%	61- 80%	81- 100%
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Political decisions reflect public opinion, at least to some extent. But sometimes politicians have to make unpopular decisions too. What do you (personally?) think: As a basis for a political decision pro strategy 1, how many percent of the **public** must accept strategy 1?

More than 75%	More than 50%	more than 25%	of no influence
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Do you expect that car driving becomes in future considerably more expensive?

No, not at all	Probably no	Probably yes	Almost certainly yes
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Based on your experiences to what extent are local political decisions in general *influenced* by the following groups. Please rank from 1 to 7 (rank 1 means strongest influence, 7 weakest influence)

• Political parties	<input type="radio"/>
• Public / Voters	<input type="radio"/>
• Media	<input type="radio"/>
• Lobby	<input type="radio"/>
• Civil Servants	<input type="radio"/>
• Local business	<input type="radio"/>
• Friends/families of politicians	<input type="radio"/>

18. You are female male

19. Your age is: _____ years

20. Member of the following party: CDU *the different*
 Or Affiliated/supporter SPD *local parties*
 Grüne
 FDP
 PDS
 none

21. How do you usually go to work/business? car
(state main mode only) public transport
 bicycle
 walk

Open question:

22. Which solution would you prefer to solve the urban transport problems in Dresden?

23. How to finance it (and by whom)?

THANK YOU.

VATT-TUTKIMUKSIA -SARJASSA ILMESTYNEITÄ
PUBLISHED VATT-RESEARCH REPORTS

43. Lehtinen Teemu: The Distribution and Redistribution of Income in Finland 1990-1993. Helsinki 1998.
44. Rantala Juha: Työvoimapolitiikan rooli ja työttömien työllistyminen. Helsinki 1998.
45. Laurila Hannu: Suomalaisen kaupunkipolitiikan taloudelliset lähtökohdat. Helsinki 1998.
46. Tuomala Juha: Pitkäaikaistyöttömyys ja työttömien riski syrjäytyä avoimilta työmarkkinoilta. Helsinki 1998.
47. Tossavainen Pekka: Panosverot ja toimialoitainen työllisyys. Helsinki 1998.
48. Holm Pasi – Kiander Jaakko – Tuomala Juha – Valppu Pirkko: Työttömyysvakuutusmaksujen työttömyysriskin mukainen porrastus ja omavastuu. Helsinki 1998.
49. Kari Seppo – Kröger Outi – Rauhanen Timo: Henkilöyhtiöiden verotuksen investointi- ja työllistämiskannustimet. Helsinki 1998.
50. Kajanoja Jouko: Lasten päivähoido investointina. Helsinki 1999.
51. Kari Seppo: Dynamic Behaviour of the Firm Under Dual Income Taxation. Helsinki 1999.
52. Holm Pasi – Sinko Pekka – Tossavainen Pekka: Työpaikkojen syntyminen ja päättyminen ja rakenteellinen työttömyys. Helsinki 1999.
53. Mäkelä Pekka (toim.): EU:n kauppapolitiikkaa itälaajenemisen kynnyksellä. Helsinki 1999.
54. Sinko Pekka: Taxation, Employment and the Environment – General Equilibrium Analysis with Unionised Labour Markets. Helsinki 1999.
55. Rantala Anssi: Finanssikriisit, yritysten nettovarallisuus ja makrotaloudellinen vakaus. Helsinki 1999.
56. Kyyrä Tomi: Post-Unemployment Wages and Economic Incentives to Exit from Unemployment. Helsinki 1999.
57. Korkeamäki Ossi: Yksityisen ja julkisen sektorin palkkoihin vaikuttavat tekijät. Ekonometrinen tutkimus 1987 - 1994. Helsinki 1999.
58. Venetoklis Takis: Process Evaluation of Business Subsidies in Finland. A Quantitative Approach. Helsinki 1999.
59. Kuusi Osmo: Expertise in the Future Use of Generic Technologies – Epistemic and Methodological Considerations Concerning Delphi Studies. Helsinki 1999.
60. Hakola Tuulia: Race for Retirement. Helsinki 1999.
61. Korkeamäki Ossi: Valtion palkat yleisiin työmarkkinoihin verrattuna: vuodet 1989 - 1997. Helsinki 2000.

62. Uusitalo Roope: Paikallinen sopiminen ja yritysten työvoiman kysyntä. Helsinki 2000.
63. Milne David – Niskanen Esko – Verhoef Erik: Operationalisation of Marginal Cost Pricing within Urban Transport. Helsinki 2000.
64. Vaittinen Risto: Eastern Enlargement of the European Union. Transition in applicant countries and evaluation of the economic prospects with a dynamic CGE-model. Helsinki 2000.
65. Häkkinen Iida: Muuttopäätös ja aluevalinta Suomen sisäisessä muuttooliikkeessä. Helsinki 2000.
66. Pyy-Martikainen Marjo: Työhön vai eläkkeelle? Ikääntyvien työttömien valinnat työmarkkinoilla. Helsinki 2000.
67. Kyllönen Lauri - Rätty Tarmo: Asuntojen hinta-laatusuhde Joensuussa, semiparametrinen estimointi. Helsinki 2000.
68. Kyyrä Tomi: Welfare Differentials and Inequality in the Finnish Labour Market Over the 1990s Recession. Helsinki 2000.
69. Perrels Adriaan: Selecting Instruments for a Greenhouse Gas Reduction Policy in Finland. Helsinki 2000.
70. Kröger Outi: Osakeyhtiöiden verotuksen investointikannustimet. Helsinki 2000.
71. Fridstrøm Lasse – Minken Harald – Moilanen Paavo – Shepherd Simon – Vold Arild: Economic and Equity Effects of Marginal Cost Pricing in Transport. Helsinki 2000.