

# Urban road pricing acceptance

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## 1. Introduction

At noon on Thursday February 1, 1990, a cordon toll system opened in the city of Oslo. At the same time a road tunnel, financed by the expected toll revenues, was opened under central Oslo. With one stroke 50 000 cars disappeared from the inner part of the city, and within a year, the number of accidents had dropped by almost 20 percent. The initial success of the tollgate system has continued. The main aim of the system was to finance road investments and the road network has been extended more or less according to the original plan. And the fraction of people in favour of the toll system has increased substantially.

The idea of relating charging directly to the use of roads is over 300 years old. In the UK and the US many turnpikes were built as private or public toll roads from the late 17<sup>th</sup> to the middle of the 19<sup>th</sup> century. However, with the exception of Singapore, the Oslo toll system and similar toll rings in Bergen and Trondheim are the first comprehensive road pricing systems implemented at the urban level. The examples set by the three Norwegian cities has certainly inspired and intensified the discussion about urban road pricing among both politicians and experts. However, as yet no other cities have followed in their footsteps. What is hindering acceptance of road pricing?

This paper reviews and summarises what we do and do not know about the acceptance of urban road pricing. The term road pricing is used in this paper to denote the entire spectrum of charging systems and goals. Road pricing may have flat or variable toll rates, conventional or electronic collection methods. Revenues may be refunded to companies or governments, and may or may not be earmarked for road or other transport investments. The discussion is structured according to the four main sources providing us with knowledge concerning acceptability. The following section reviews what we can learn from economic theory. The third section describes the results of various surveys and interviews. In the fourth section, we draw conclusions from cities that have discussed, planned or implemented road pricing schemes from the point of view of acceptance. A summary is provided in section five.

Most examples presented in this paper, particularly in section four, are based on experience from the PRIMA project, a DG TREN-supported collaboration among 7 cities to investigate key factors in building road pricing acceptance. Cities studied included Stockholm, Oslo, Trondheim, Lyon, Marseille, Zürich, Bern, Rotterdam and Barcelona.

## 2. Lessons from economic theory

Public acceptance is by no means a clear-cut concept. Assume some individuals perceive a policy measure acceptable but others do not. What criteria should then be used to decide if it is acceptable or not for the collective? It is not acceptable if the agreed upon decision criteria states that a measure should only be implemented if no one will lose and at least one gain. If instead the majority rule is applied the measure will be regarded as acceptable as soon as the fraction supporting it exceeds 50 per cent.

What if the people and their political representatives have different views? If less than 50 percent of the affected population accepts a new measure, it might still be deemed as acceptable by the politicians in charge or rather by a majority of them. The Oslo toll system is a good example of such an ambiguity. In other cases a policy measure might be accepted by a majority of the citizens but considered to be unacceptable by the political level. Lowering gasoline taxes is an example.

There is also a time aspect related to acceptance. Changing values, new knowledge or a new “state of the world” may make a formerly unacceptable policy become acceptable and vice versa. In the Stockholm region a cordon toll system was planned and decided in the beginning of the 1990’s. The system was rejected in 1997 because of a changed political situation.

These ambiguities notwithstanding, economic theory provides us with some insight into what kind of individual acceptability reactions that can be expected. Economic theory assumes that individual road users are rational and base their trip decisions upon a comparison of the benefits and costs that they will receive from using the road. The costs considered by them normally do not include the congestion cost their travelling impose on other road users or the negative environmental effects their driving impose on a smaller or larger fractions of the population. Since these cost components are not considered, some trips will add more costs than benefits to the society and as a result the road system will be overly or inefficiently used.

The disregard of these “negative external effects” and the resulting inefficiency constitute the basic theoretical rationale for road pricing. By introducing a charging mechanism directly related to the use of a road it is in principle possible to force all travellers to also consider the external costs. If such a charging system is implemented there will be both winners and losers. According to the fundamental economic welfare criteria, the Kaldor-Hicks criteria, such a change will increase the overall social welfare if the winners are able to compensate the losers and still be on the winning side. If each traveller has to pay a charge that equals the gap between the social and private cost of the trip it will be possible for the winners to do that.

Road pricing also has another type of impact. Except for the short-term influence on transportation flows other markets will be affected. In particular, the introduction of road pricing may induce households to change their location patterns, their workplaces, and their travel decisions as regards retail services, recreation etc. Location

adjustments will affect the markets for labour, land, retail services etc., as well as travel behaviour. Firms will also be affected in a similar way. In general, the interaction costs will be higher. This means that the road pricing system will make the location of some firms non-optimal, and that may in the end force some of them to relocate. In any case, the impact will include both that firms will have to pay a toll and that their locations may not be optimal more.

As shown by e.g. Rietveld and Verhoef (1998) and Johansson and Forslund (2000) the net benefits of travellers affected by a pricing scheme closing the gap between private and social costs can be assessed by dividing them into three groups. Those who stay and pay will on average become losers. They lose more than they gain because their toll payment exceeds the value of time they save (it has to in order to close the gap). The second group includes those who change their travelling pattern –to another mode, route or time of day. They are obviously made worse off since they would not otherwise have changed their behaviour.

Those who use public transport and continue to do so risk facing a more crowded environment. This reduction in quality implies that they become worse off provided that faster or more frequent public transport (made possible by less congestion) does not outweigh the crowding effect.

It no doubt seems strange that all three groups will become worse off if congestion tolls are introduced. The explanation is that the toll collector is the main gainer of the pricing scheme. If all effects are added up the net benefit will be positive as expected.

A politician believing in the idea of road pricing and also interested in being re-elected would immediately realise that the allocation of toll revenues to different uses is a strategic issue. It seems evident that everyone would gain if the revenues were in some way channelled back to the three groups of travellers. As long as we assume that all travellers are identical as regards their appreciation of a given reduction in travel time this means that it should be relatively easy to “sell” road pricing to the public. However, public acceptability will be more difficult to obtain as soon as we relax this simplifying assumption and instead assume that people differ in their valuation of travel time reductions. Eliasson (1998) has shown that this kind of heterogeneity makes it very difficult to design a congestion pricing scheme that fulfils the two following requirements.

- More than half of those affected should be better off with than without the pricing system
- Aggregate welfare should increase for those involved

Designing and implementing a congestion pricing scheme, which is optimal for the average individual and returning the revenues to the losers is not enough to fulfil the two requirements. A majority of the users may still be worse off. This is further explained by the more general problem indicated by figure 1. The figure indicates that a skewed distribution of the benefits resulting from a certain policy measure can cause a large variation in net benefits if all of them are charged the same amount. The curve in the figure shows the distribution of benefits ordered from the highest to the lowest benefit and the charge is indicated by the line A. The fraction of losers is larger than the fraction of winners in spite of the fact that the total gain is positive.

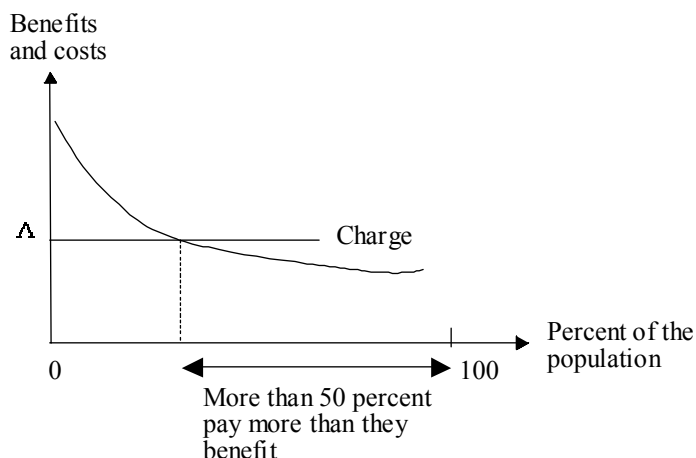


Figure 1. *Distribution benefits versus charge*

As a consequence we can expect that politicians who think that people may have rather different values will find it more difficult to argue for road pricing. It will be even more troublesome for those who care about equity and who believe that the value of time tends to be higher the higher the income level.

Rietveld and Verhoef (1998) note that political acceptability is not only related to the trade-off between total welfare gains and equity aspects; one should also consider the attitudes concerning the severity of environmental problems caused by road traffic. Many people participate in elections even though the probability that their vote will influence the election outcome is exceedingly small. Using this observation, Rietveld and Verhoef argue that people judge political parties both according to their personal interest and according to social values such as caring for the environment. Their conclusion seems to be that there is some scope for environmentally friendly policies such as road pricing even if such a policy does not gain support from a majority of the citizens.

Uncertainty is another aspect with bearing upon the acceptability issue. If we leave the deterministic world of the economic textbook it seems clear that any classification of a policy as “efficient” or “fair” or “environmentally friendly” is bound to be uncertain. Keeping things simple such a categorisation can be illustrated as in figure 2.

Efficient?	Sustainable?		
	Yes	Perhaps	No
Yes			
Perhaps			
No			

Figure 2. *Schematic classification system for transport policy measures*

The figure indicates that any (transport) policy proposal can be categorised according to the expected effect upon the objectives and according to uncertainty, that is according to the risk that the expected effects will turn out to be wrong. It seems reasonable

to believe that political decision-makers aiming to achieve an efficient and sustainable transport system would tend to prefer measures having large positive effects to those expected to have small positive effects provided that the related risks were of the same size. And that they would prefer low risk to high risk measures provided the expected outcome was the same. Some of them would perhaps be inspired by the theory of corporate finance, or by their own experiences of owning shares and think in terms of portfolios or packages of measures rather than in terms of single measures. They would ask their experts to compose and characterise a number of policy measure portfolios in terms of expected outcome and risk. Then they would think about the proper trade-off to make between expected outcome and risk. For this reason it should not come as a surprise if politicians now and then reject policy proposals advocated by deterministically inclined economists.

In the literature on acceptability, e.g. in deliverable 3 from the CUPID project, it is often stated that social acceptance of road pricing depends on both the “perceived” and the “real” benefits. It seems more fruitful to assume that ex ante assessments of benefits and costs almost always are associated with uncertainty either they are made by ordinary travellers, experts or politicians. Doing that it becomes important to try to find ways to handle the uncertainty in a rational way.

In most cities, major policy decision concerning the transport system will involve politicians representing different layers of government. As a result it will be difficult for the national government to impose an urban road pricing schemes without approval from the regional and local politicians concerned. National decisions of that kind may have been possible when centralised decision making was more common but other kinds of decision mechanisms are needed in an environment characterised by increasing decentralisation and by growing demands for influence from local and regional politicians.

Likewise it is not possible for politicians at the local and regional level to introduce road pricing without approval from the national government. In most countries the urban areas lack the legal authority to introduce road pricing autonomously. The often held opinion that the cities first have to deliver a concrete proposal for road pricing before changing legal backgrounds at national level is not convincing. The incentive for cities to invest in planning road pricing systems is very low if they do not know when (if ever) national legislation will allow them to introduce such measures. The necessity of political negotiations across layers of government and between different parties as well as the need to consider voter reactions mean that a long process of actions and interactions is needed before implementing an urban road pricing system.

Using this perspective and adding the uncertainty aspect, it seems clear it is not enough to use the kind of simple linear decision making style schematically represented in the left part of figure 3 when analysing the acceptability of urban road pricing. The figure is inspired by the two policy making styles or models described by Lindblom (1977): the synoptic model and the strategic model. The stylised figure to the left outlines seemingly simple decision steps including problem identification, analysis, recommendations and implementation. This is the synoptic perspective on decision making. It requires that each policy measure is analysed as an integrated part of the urban transport system and emphasises the quality of analysis both as regards breadth and long term effects.

The right part of the figure illustrates another and probably more appropriate kind of logic in the urban road pricing context. This strategic perspective calls attention to the need for an interactive strategy to guide an inevitably incomplete analysis. Since it is often difficult to provide a clear problem description from the outset, since policy measures are always characterised by risks, and since new and unexpected circumstances will always arise it will be difficult for the involved decision makers to come to an agreement. Therefore they might choose to proceed incrementally and sequentially. Such a process will be characterised by close interaction between politicians, stakeholders and representative of the citizens and probably also between means and ends.

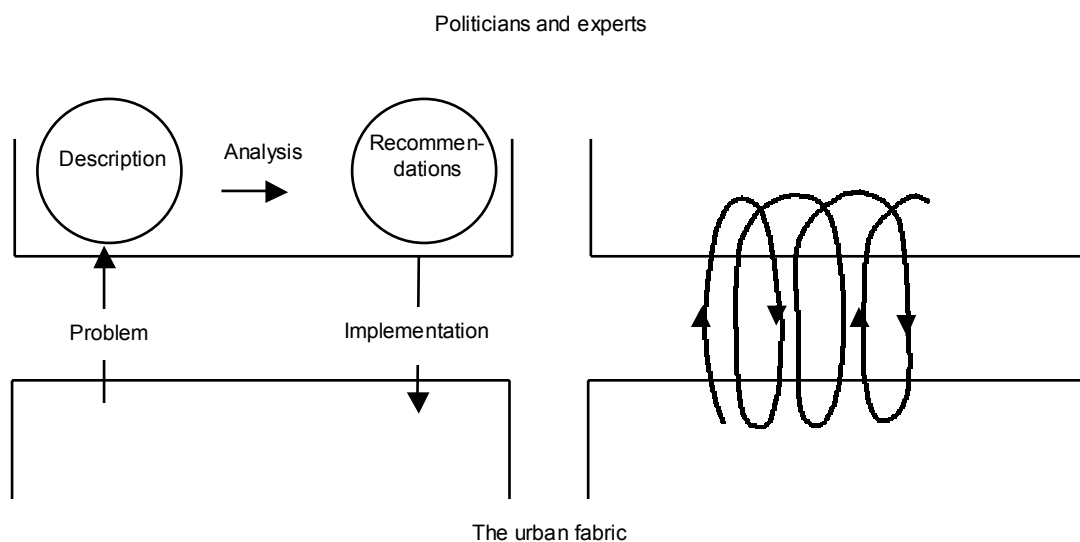


Figure 3. The linear (left) and the dynamic (right) approach

### 3. Surveys and interviews

A multitude of surveys has been undertaken in different cities and countries in order to learn about public concerns and attitudes about road pricing, see for example Golob(1999), PRIMA (2000), Harrington et al (1999) and Jones(1998). There are also several studies that cover the opinions of politicians, stakeholders and various experts, e g Ison (2000).

The most common message from studies of this kind is that a clear majority of the public is negative to urban road pricing. However, Jones (1998) reports that the “popularity” is rising over time in UK. This increase may be related to the fact that the public concern about the growth of urban road traffic and its consequences is growing in many cities and countries. According to recent surveys undertaken by order of the Government Office for London over 90 percent of Greater London residents thinks that “there is too much traffic in London” and 53 percent of London residents thinks that a road user charging system, in the form of an area licences with a daily charge of £5 for Central London and £2,50 for Inner London would be “a good thing for London”.

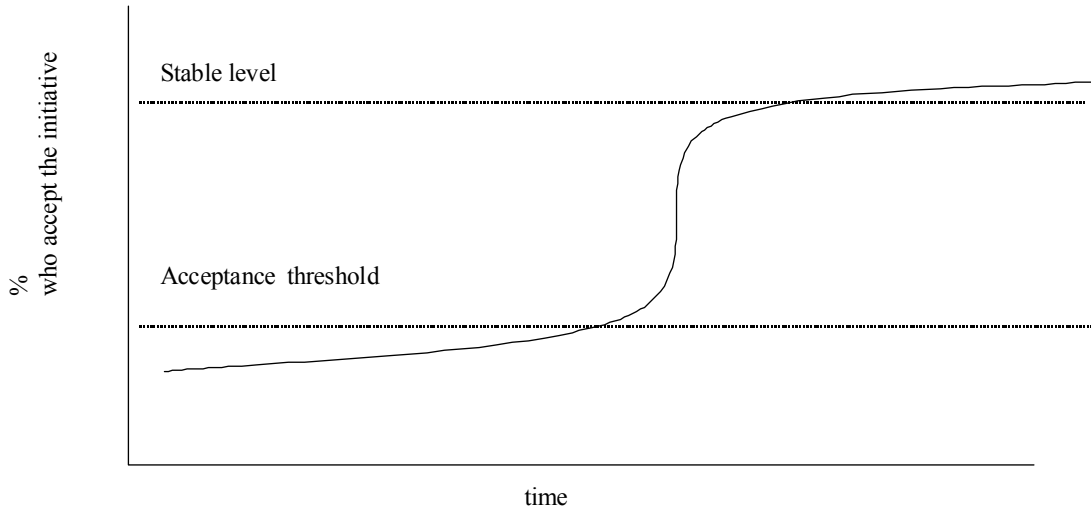
Partly as a consequence of the general dislike of urban road pricing from the population, the politicians are sceptical. The political commitment to explain the need and the ambitions with road pricing has so far been rather weak and it has been difficult to create a stable political majority including all involved levels of government.

Evidently, both public and political acceptability of road pricing is related to the nature of the road system. Since long there are interurban toll roads in many countries and congestion pricing schemes have been introduced on some interurban roads, i e the expressway connecting Lille and Paris, without giving rise to severe objections. One important reason for this is probably that interurban transport often takes place on well-defined links for which it is rather easy to assess the expected consequences and to communicate the results to the public. The urban transport network is considerably more complex with several partly competing partly complementary modes of transport. As a result it is much more difficult for both the public and the politicians to get clear and reasonably reliable answers to questions about the expected effects of implementing a road pricing scheme .

The toll system operated in Barcelona is illustrative in this respect. Since the 1970's interurban toll roads have been operated in Catalonia by private concessionaires. Because of urban growth and sprawl some links of the tolled roads have become surrounded by urban settlement. This has led to increasing congestion and environmental problems along toll-free routes constructed for local and regional traffic.

It seems quite natural that most people will dislike the idea of paying tolls for trips that they are used to make without paying. Furthermore, and as Machiavelli argued and as firms marketing new consumer products and services can confirm, it is both difficult and time consuming to gain support for new concepts and ideas.

The PRIMA interviews indicate that the kind of S-shaped time profile of acceptance that is often observed for successful new consumer products may also describe the process of gaining acceptance for urban road pricing among European cities. If that is the case, then the probability that cities will join the "Road Pricing Club" will grow rapidly once the number of club members reaches a certain threshold value.



*Figure 4: S-curve describing the rate of public acceptance for new products or policy initiatives*

It also seems natural that public support for road pricing is related to the severity of congestion and traffic related pollution and to users' perception of various attributes characterising the road pricing system they are asked to express their opinion about. Studies indicate that the public acceptance of road pricing depends upon the following:

- severity of traffic problems and perceived improvement if road pricing is introduced
- freedom of choice, availability of alternative modes
- user-friendliness and perceived effectiveness in relation to other policy measures
- allocation of the toll revenue to various uses
- equity impacts

Severe traffic problems seem to be a necessary but not sufficient condition for acceptance of road pricing. Most cities have congestion problems that tend to be increasing but only three Norwegian cities have implemented pricing schemes. Oslo was in fact almost choked by traffic when the decision was taken to implement a toll ring. Stockholm also had serious congestion problems when the road pricing plans were drawn up. Shortly afterwards Sweden was hit by the worst economic recession since the 30's which partly explains why the plans were abolished. Another example is provided by the public reactions to the road pricing schemes implemented in Marseille and Lyon, both of which have serious traffic problems. When the road tunnel through central Marseille was opened the public was mainly positive, but when a tolled link was opened on the northern ring road of Lyon it resulted in riots and protests. According to the interviews undertaken in the PRIMA project this difference is mainly ex-

plained by the much better communication with the public and the media in the case of Marseille.

That freedom of choice is important is witnessed by the fact that improved public transport seems to be the by far most frequent answer in surveys asking people about the use of toll revenues. The importance of having access to good travel alternatives if road pricing is introduced may of course also be related to equity considerations. Both a large fraction of the public and many politicians are afraid that charging for road use would hit the drivers with the lowest income too hard if they were not offered improved public transport services. Between 45 (Oslo) and 80 (Zürich) of the 500 households surveyed in each case city of the PRIMA project agreed with the statement that road pricing would have a negative effect on lower income brackets.

Jones (1994) reports that a large fraction of the public is concerned about the practical feasibility of road pricing schemes. According to a survey in London more than 20 percent thought that it would be unworkable or large numbers of drivers would not pay. According to the fourth framework project PATS, worries about the protection of privacy has turned out to be a key barrier to acceptance in several attitude surveys. However, only a small fraction of the 240 politicians, experts and stakeholders that were interviewed in the PRIMA case cities considered individual privacy as a major political issue. Nevertheless some interviewees thought that arguments of dangers with regard to data protection would become useful in a political fight against road pricing.

Most people rate road pricing low with respect to effectiveness in relation to other policy measures. According to the PRIMA surveys at least 80 percent give top priority to improved public transport and according to Jones (1998) UK surveys show strongest support for policies that provide alternatives or supplements to car use. Ison (2000) present a slightly different picture. His examination of attitudes among key stakeholders with respect to road pricing shows that road pricing is considered to be the most effective measure for reducing congestion next to banning vehicles in central areas.

The allocation of toll revenues plays an extremely important role for acceptability. In a study of congestion pricing on interurban roads Harrington et al (2001) found that a promise to offset congestion charging by reducing other taxes result in a significant increase in support for the pricing scheme. Among the stakeholders surveyed by Ison (2000) the fraction considering urban road pricing acceptable was 11 percent before and 55 percent after the revenues had been allocated to various uses (according to the priorities expressed by each person). The recent surveys undertaken by order of the Government Office for London give similar results. The fraction of residents thinking that road user charging would be “ a good thing for London” increased from 53 to 67 percent when it was proposed that the revenues of the charging scheme would be invested in transport improvements. It is also quite clear from the PRIMA interviews that both experts and politicians strongly believe that the revenues has to be channelled back to the travellers in order to increase the acceptance.

Langmyhr (1997) and Jones (1998) state that concerns about various equity aspects seem to be a main barrier to public acceptance. According to Jones this concern derives from two sources. Firstly, the urban road network should in principle be looked

upon as a public space and as such should be free for all to share without paying for it. Secondly, the question is if ability to pay a charge and the importance of a trip are synonymous. Langmyhr and also PATS 2000 point out that the location of toll gates in a city will give rise to equity discussions. Evidence from Norwegian cities suggest that the public oppose charges for “necessary” trips, such as trips to local shops, post offices, primary schools etc. Better public transport service is the most often recommended remedy to counteract negative equity effects. In the case of urban toll rings other remedies that can be found in Norwegian cities are monthly passes, limits on the number of charged trips per hour or free passages through the toll gates in the evenings or during the weekends.

## 4. Experience with road pricing

*Implemented over ten years ago: Oslo*

Norway has a tradition of financing large transportation investments such as roads and bridges with tolls. By law, this type of toll may only be used to finance the building of infrastructure, including costs for the toll system itself. Norwegian cities that wish to introduce these tolls must have the express permission of the Norwegian government, and once the capital investment is recovered, the toll must be eliminated.

Oslo, Trondheim and Bergen have all introduced tolls on cordon rings surrounding their city centres. In Oslo, this toll ring was part of a comprehensive package of transport investments, mostly focused on improving the road system. (Oslopakke 1). The package, originally expected to cost NOK thirteen billion (1999 prices) has since swelled to almost NOK 30 billion. The toll, introduced in 1990, is expected to be revoked in 2007. Currently, a new NOK 16 billion package of transport investments in both roads and improved public transport is planned, for production between 2002 and 2005. This will be financed in part by raising public transport tickets by NOK 0.75 per trip and raising the road toll by NOK 2 per passage.

In May 2001, the Norwegian parliament passed a new law opening the way for Norwegian cities to introduce congestion pricing (*vegprising*). The new law, which has been discussed for several years, constitutes a considerable policy shift. The implied decentralisation will make the role played by cities and regions more important. They will now be able to initiate and plan road pricing systems from the perspective of transport demand management. The pricing scheme can be kept as long as it is needed to regulate the flow of traffic and the toll revenues will be earmarked for transport system improvements. The new law has the following basic principles:

- The goal of the road pricing must be to regulate the flow of traffic
- This road pricing may not be used in combination with the traditional toll (*bom-peng*) system
- In general, cities and the Norwegian state must agree to the system in each case; however, the Norwegian state reserves the right to impose road pricing on cities. In practice, this is highly unlikely.
- Net revenues are shared 50/50 between the State and the participating city.
- Revenues may only be used for transport investments, including environmental reparations to damage caused by the transport system

Oslo's current transportation plan notes an intention to introduce this type of road pricing when the current time period for the cordon financing toll expires in 2007. However, Oslo may introduce rush hour tolls before that date, as has already been introduced in Trondheim. In this transition solution, tolls are higher during weekdays and rush hours, but all revenues must still be used to finance the remaining capital debt.

Support for road pricing in Oslo, and indeed in Norway in general, has grown and users appear to accept both the current system and future congestion charging schemes. 65 percent of Oslo's population was opposed to the toll ring before it opened. Six months later, opposition had decreased to 60 percent. Today, at least half of the population is estimated to support or at least accept the policy.

What are the keys to Oslo's success? One may be that road tolls have been used for a long time to finance new roads; when Oslo introduced its toll in 1990, it could draw on Bergen's experience five years earlier. In addition, a strong collaborative relationship between the city, county and state has facilitated the introduction of the toll system. In addition, the national government has been willing to finance a large share of infrastructure costs if tolls are also introduced, so that tolls can be kept at reasonable levels. In Oslo's case, this allowed Oslopakke 1 to be built in years instead of decades, which was a key factor in securing the support of local businesses and motorist organisations. Many felt that tolls were preferable to continued traffic chaos.

In sum, Oslo may well have succeeded in building acceptance for its current and future road charging policies by successively introducing ever more progressive charging systems. The toll began as a financing strategy with clear and immediately evident benefits to motorists. It was strategically important to open a major tunnel under Oslo's City Hall immediately after the toll was imposed. Technical improvements and electronic systems have ensured that paying does not impede traffic flows. Ten years later, motorists are used to the tolls, so continuing to collect road charges to cover other transport investments will not affect daily travel patterns. Finally, the city and county carefully planned its communication and "marketing" of the toll policy to ensure that motorists understood how it worked and why it had been imposed. It will, however, be interesting to see how the public reacts to rush hour charging, especially if peak hour travel becomes significantly more expensive.

#### *On the horizon: Rotterdam*

Holland's national government finances most major transportation investments, so cities are dependent on state funds for capital and operating costs associated with city roads and public transport systems. However, in recent years cities have introduced pricing systems to control traffic flows and reduce congestion. Rotterdam, dependent on smooth flows of goods traffic from its massive harbour, has developed the so-called Select System. This system includes special lanes for goods traffic along key corridors to avoid goods transport delays due to passenger car congestion. This is based on the notion that "necessary" traffic must be given priority. In the future, Rotterdam may allow passenger cars and other vehicles to use the goods lanes for a fee.

Meanwhile, the Dutch government has proposed a road pricing scheme for the entire Randstad area (comprising Amsterdam, Rotterdam, the Hague and Utrecht) as part of its national mobility strategy to ease congestion and meet national goals for sustainable transport. (*Bereikbaarheids Offensief Randstad*). The system, originally called "Rekeningrijden" includes the construction of new toll roads and express lanes supported by information technology to facilitate payment and monitor the system. Revenues would be used to reduce other taxes.

Initially, this proposal met with strong opposition from the four metropolitan regions. Cities feared that it would weaken the position of individual cities and the entire

Randstad region in a European perspective. Rotterdam preferred to introduce its own Select System. After a lengthy period of debate and negotiation, Rotterdam reached a preliminary agreement with the national government in Summer 2000 to introduce a modified toll system called "Spitztareif" (rush hour fee). The new system was also meant to reduce car traffic but had a stronger orientation towards financing of new infrastructure. Another idea was to include a two-year test period. If successful, it could be implemented across Holland.

A key factor in reaching this compromise was the stipulation that revenues from the new system would be channelled into regional "mobility funds" which would, up to a certain level, be matched by state funds. The use of these revenues would be determined by regions and cities, though as in Oslo they would be used to support transport goals. This seems to reflect a general trend in Europe towards the decentralisation of decision-making from the national to regional and local levels.

However, the preliminary agreement did not last long. After trying but failing to pass a proposal to implement a charging system differentiated by time and place in May 2001, the Dutch government is currently planning to introduce a flat charge per kilometre driven on all roads (including urban roads). The charge will depend on vehicle weight and emissions.

As in Oslo, the stepwise introduction of road pricing in Holland seems to be necessary to its success. According to current plans a variable tariff rate will be introduced at a later stage. Technical experiments are planned for 2003.

#### *A package that failed: Stockholm*

In January 1991, leading politicians in the City and County of Stockholm (Social Democrats, Conservatives and Liberals) under the leadership of Government negotiator Bengt Dennis, reached an agreement on a massive transport investment package. The Dennis agreement comprised a comprehensive package of road and public transport investments combined with a system of road tolls. It was finally adopted in September 1992. From the beginning three elements of the package were strongly criticised. Except for the toll ring, it was two major road investment links: a western orbital road and the eastern part of an inner ring road.

In retrospect, the political unity about the contents of the (Dennis) agreement was never really stable. The three leading political parties that signed the agreement in 1992 had in fact totally different priorities regarding the construction of two major ring roads and the introduction of road pricing. Their priorities were roughly as follows:

	The Outer Western Orbital	The Eastern Ring	Tolls
Conservative Party	2	1	3
Social Democrats	1	3	2
Liberal Party	3	2	1

The Conservatives could only accept road tolls if the revenues were earmarked for road investments. They were most keen on the Eastern Ring and ranked the Outer Western Orbital as number two. The Liberals were the most positive, or perhaps more appropriately expressed the least negative, regarding road tolls and they were only, though very reluctantly, willing to include the Outer Western Orbital as a part of the package. The Social Democrats gave first priority to the Outer Western Orbital and they accepted road pricing as a way of financing the investments. They disliked the Eastern Ring, perhaps because of fears that private landowners would gain most from it, but still accepted it as a part of the package. According to one leading politician the agreement could be characterised as a “terror balance” rather than as a true compromise.

Add to this that all other parties were against the agreement and demanded that it should be re-negotiated. And that the 1994 election resulted in a new political power balance at both the national and regional level and in the city of Stockholm. At all levels the social democrat seized the power by support from the parties that were against the agreement. As a result of the growing political difficulties caused by the agreement, the national government, which actually initiated the Dennis package, withdraw its support in 1997.

The rise and fall of the Dennis package demonstrates the danger of using the linear type of decision process. Once the package was fully defined and agreed upon the politicians involved were not prepared to make any changes, neither in view of new circumstances, such as a deep recession, nor because of critical arguments from various stakeholders and the public.

## 5. Conclusions

There are some indications showing that the public resistance to urban road pricing is decreasing. However, the general impression from this review is that public acceptance still is rather low.

Some key conclusions related to the acceptance of road pricing can be summarised as follows:

1. Acceptance relates to perceived benefits by users, non-users and potential investors and toll operators. The traffic problems of the city must be evident and it must be demonstrated that road pricing is the best way to complement other measures and thus to handle the problems for users as well as non-users. Road pricing should rather be perceived as a "facilitating" instrument and not as a kind of punishment. Furthermore potential concessionaires should feel convinced that it might be a good business.
2. Acceptance relates to availability of alternative modes of transport. Surveys show that road pricing often works well as part of a comprehensive policy package of road and public transport investments. This can include compensation for groups whose welfare will decrease by the road-pricing scheme. However the package must be of manageable size and need not be implemented all at once. The larger the package of policy measures, the larger is the risk that the political strings are not long enough to keep it together.
3. Acceptance relates to the level of charges and to the use of toll revenues. Experiences from the PRIMA case cities indicate that fairly low starting levels are needed and that the charges can be increased successively to meet financial requirements.
4. Acceptance relates to equity effects. Notice should be taken of effects related to income as well as to the location of housing, workplaces and service centres. Compensating measures should be considered for groups whose welfare will decrease by the pricing scheme.
5. Acceptance relates to the design of the decision making process needed for the introduction, discussion and implementation of a road pricing scheme. According to the PRIMA interviews a stepwise procedure characterised by adaptive learning seems to be best from the acceptability point of view. A financing toll system is more easily accepted than an ambitious pricing scheme differentiated by time and area and thus allowing for influencing travel behaviour. Furthermore, a pure financing scheme can be developed successively as more experience and knowledge is gained about the resulting effects. The complexities involved call for a widening of the classical synoptic approach to an adaptive learning process.
6. Acceptance relates to the negotiating abilities among the politicians involved at different levels of government and among the experts and planners representing the various affected governmental bodies. A bottom-up strategy where the initiative to introduce road pricing comes from the urban area, is essential but not enough. A sup-

plementing top-down strategy is needed as well. The national legislation must be changed in many countries and financial support from the national government will make it easier for the urban citizens, especially car users to accept increased personal expenses.

7. Acceptance relates to the communication efforts initiated in the very beginning of the decision making process. The starting point for introducing road pricing must be a political and public discussion on the traffic problems and the general objectives of the urban transport policy. Representatives from the public should also be invited to discussion and assessment meetings and be given rich opportunities to suggest modifying alternatives.

8. Acceptance of urban road pricing depends on earlier road pricing experiences. Hence, EU-support for activities aiming at dissemination of information experiences between cities is very important. In the long run it will also be important to continuously assess the coherence of urban development and urban road pricing with existing interurban road pricing systems since public acceptance can be negatively affected if there are inconsistencies in the interface where these systems meet.

9. Acceptance from a majority of the citizens can not be expected from the outset. It will increase by an open communication process. Experiences from several cities show that acceptance tend to increase after the implementation. However, building acceptance is a long process that must continue even after the scheme begins operation.

Enabling laws are not always enough. The Norwegian experience demonstrates the importance of national incentives that stimulate urban areas to adopt road pricing. In Oslo, as well as in Trondheim and Bergen, the national government supplemented the revenues from the toll rings with an additional fund to improve the transport system. The extra funds are equal to the toll revenues. According to our interviews, it is doubtful if the urban politicians would have dared to implement the toll rings without this financial support from the national level.

The necessity of extra national funds is also indicated by the preliminary outcome of the negotiations between the city of Rotterdam and the national government. By supporting Rotterdam's pay lane concept as well as other improvements of the public transport system, new roads etc the national government has gained acceptance from local and regional politicians for a toll ring.

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