

APPENDIX C: CASE STUDIES ON ACCEPTABILITY

This appendix provides further information and lessons learned on acceptability from various scheme proposals.

C-1 NORWAY

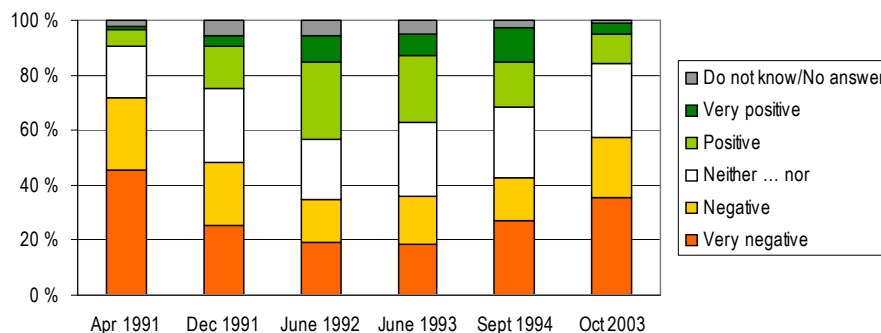
The first Norwegian urban toll ring was established in Bergen in 1986 to raise finance to accelerate the implementation of a wide-ranging programme of transport investments. Since then, a number of other Norwegian cities have adopted the scheme including: Oslo, Trondheim, Stavanger and Kristiansand (Ramjerdi *et al.*, 2004) as well as the smaller settlements of Tønsberg and Namsos (Wærsted, 2005). Both Oslo (1990) and Trondheim (1991) use automatic toll collection, made possible with modern electronic permits. In Trondheim, the tolls became differentiated by time of day, thus resembling more of a congestion charging scheme. These toll cordon schemes, especially the three major urban toll systems in Bergen, Oslo and Trondheim, have been extensively documented, e.g. Larsen (1988, 1995, 2001) Langmyhr (1999, 2001, 2003), Tretvik (2003), Ieromonachou *et al.* (2006) and Wærsted (2005). The reader is referred to these sources for a detailed description of the schemes and their implementation.

The main background for all these road toll projects was to obtain additional user funding to faster realise important main road projects than would it be possible with state funds alone. Furthermore, these schemes operated only for a limited period of time, approximately 15 years. After this period some cities such as Bergen and Oslo have introduced a second time-limited toll ring scheme referred to as package 2. In that sense these toll rings are different from congestion charging schemes. Nevertheless, their experience with low public acceptability as a main barrier to implementation may hold important lessons for other cities.

In Bergen the shift in acceptability from merely negative before the implementation to rather positive afterwards was first observed. The public was overwhelmingly against the toll scheme at the start of the project. However, at the time that the toll ring was introduced, the most important factor was to win over the local politicians and not the public. Larsen (1988) reported an opposition of 54% one month before the introduction, only 13% of the public were unreservedly in favour. Opinions started changing when the first results were apparent. Within a year 50% of the respondents were in favour and 36.5% were opposed.

Opinion polls on the attitudes to the Trondheim toll ring indicated decreased opposition during the first years after implementation as well, but the long-term trends show negative attitudes towards the RUC system increasing again (Figure C-1).

Figure C-1 Public acceptability change of the Trondheim toll ring



Source: (PRoGRéSS, 2004)

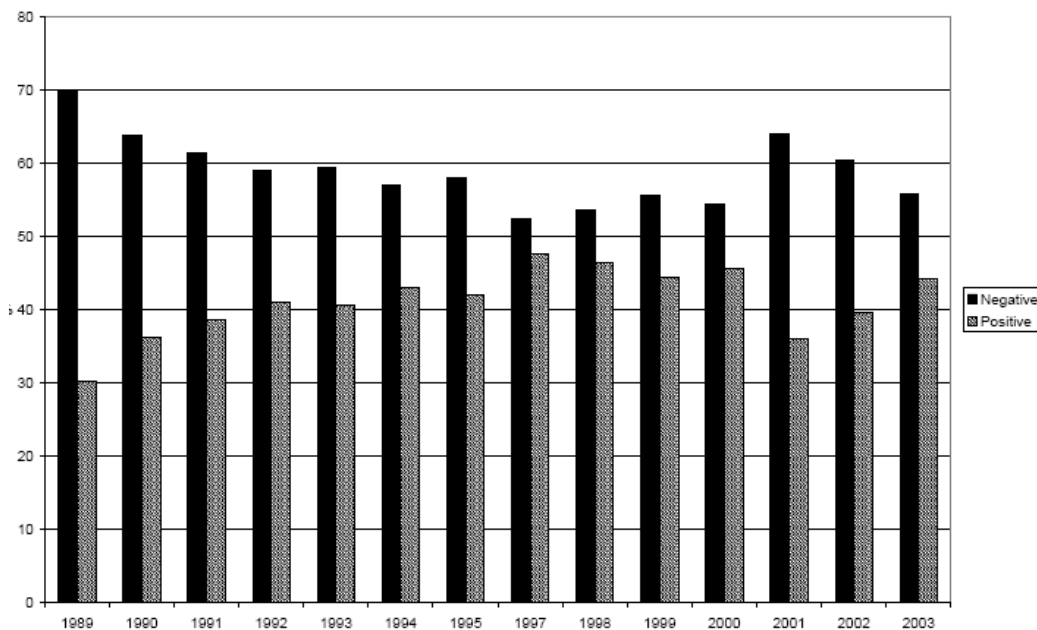
The toll ring started operating in October 1991. In April 1991, five months before the start, 72 % of people held negative views, and only 7 % were positive towards the toll ring. In December 1991, two months after implementation, the share of negative views had dropped to below 50%. In succeeding opinion polls in the summers of 1992 and 1993, the critical views dropped to around 35%, while the proponents' share increased from 19 % to 37 % in 1992, although it dipped again to 32 % in 1993. By 1994 the share of negative views had increased to 43 %, and of positive ones reduced to 29 %. This "negative" trend appears to have lasted, and in October 2004 the majority were negative (57 %), and only 14 % were still positive towards the toll system. It seems that the share of respondents being frustrated about it had grown considerably. That means, the positive level of acceptability after implementation is not guaranteed throughout the lifetime of the scheme.

The Trondheim toll ring has stopped operation at the 31st of December 2005. Politicians insisted to end the scheme, keeping in line with the promise made that any toll project would not run for more than 15 years and at the same time enhancing public trust in future political promises (Ieromonachou *et al.*, 2006).

Since 1990 road and public transport investments in the Oslo region have been partly financed by a toll ring (Oslo Package 1, in 2001 supplemented by Oslo Package 2 dedicated to investments in public transport). Odeck and Bråthen (1997, 2002) examined the changing users' attitudes towards the Oslo toll ring from 1989 to 1995 and found that users became more and more positive towards the tolls as the benefits of tolls accrued to them through better infrastructure.

A time series analysis however, also shows the changeableness of public acceptability (Kjerkreit and Odeck, 2005). The main trend was a gradual increase in public acceptability from 30% agreement before the start of the system in 1990 to 48% in 1997. This positive trend levelled off at around 45% in 1998-2000, before it dropped significantly to 36% in 2001 (see Figure C-2). This decrease is attributed to a considerable increase of the charge level introduced in 2001 (see also Tretvik, 2003). Even though in the following year public support increased again, it never reached the same level as before 2001.

Figure C-2 Acceptability change of Oslo toll ring



Source: Kjerkreit and Odeck (2005)

Oslo Packages 1 and 2 are generally considered to be success stories, but many important transport projects will not be financed by 2008. Furthermore dismantling the Oslo Toll Ring is in the short term calculated to increase road traffic by 8-10 %. Expected traffic growth from 2001 to 2025 without the toll ring is around 30 %. Critical parts of the trunk road system (mainly some tunnels) may be overloaded by 2015. The Inner city is already considered to receive traffic flows near its capacity, in terms of road space and environmental conditions. On this background the politicians in the county councils of Oslo and Akershus have initiated work on a scheme for prolonged user payment beyond 2007, a possible Oslo Package 3 for which preparation are currently under way.

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The successful implementation of the Norwegian schemes rests on a combination of several factors (see Langmyhr, 1999 for more details). The experience indicates that tolling with the purpose of raising funds for infrastructure investments and environmental improvements is more acceptable to the general public than tolls aimed at managing demand. Extra state funds have supplemented local user fees, thus increasing the total investment resources and contributing to local acceptance.

Furthermore, it has been important to establish a close co-operation between influential local politicians and the resourceful County Roads Offices acting as prominent road pricing promoters. During the long time-span of planning and preparations, it has been necessary to revise the scheme features according to changing political preferences. A crude road pricing scheme is better than no scheme. Some traffic management and correction of externalities can be achieved even if the official purpose is supposed to be fund raising for infrastructure investment. It is more likely to gain acceptance for a more sophisticated demand management instrument if a city has already implemented a crude toll ring.

In addition, local and national geographical features may have influenced the likelihood of acceptance. The ubiquity of ferry-crossings in Norway has provided many motorists with the experience of user fees. The distance between rival cities may be of some importance, as commercial interests are likely to object to measures that worsen the terms of competition. If a conurbation spreads across administrative borders, involvement from regional and national authorities may be necessary to settle local disputes (Langmyhr, 2003).

Since the first toll ring in Bergen 1986, the road investment bias has been decreasing in most toll ring packages. However, there are differences in degree, partly due to local political preferences. The Stavanger package, Bergen package 2, Oslo package 2 and Tromsø package 2 signify a possible new era of packages with public transport predominance. In accordance with the overall trend, extraordinary state funds for road investment have gradually been reduced. On the other hand, the possibilities to obtain state funds for the public transport part of investment packages (e.g. rail infrastructure) have increased somewhat. A revision of the Norwegian Road Act now opens up for developing the demand management side of the charging regimes (e.g., sharper time differentiation), as well as a wider range of revenue use in the transport sector (e.g. covering public transport operating costs). This opens up the possibility to develop the Norwegian urban toll rings further into congestion charging schemes.

C-2 LONDON

On 17th February 2003 the Mayor of London, Ken Livingstone, launched the first major congestion charging scheme in the UK. The aim of the scheme was to

- to reduce congestion,
- to make radical improvements in bus services,
- to improve journey time reliability for car users,
- to make the distribution of goods and services more reliable, sustainable and efficient (TfL, 2003).

The charging area covers the city centre of London, 21 km², representing 1.3 per cent of the total 1,579 km² of Greater London. Motorists are charged £5 to drive into or within the zone, or even to park in non-private spaces within the zone, between the hours of 7 am and 6.30 pm, Monday to Friday, excluding public holidays (TfL, 2004). There are a number of exemptions such as taxis, motorbikes / mopeds, emergency services, disabled persons and buses. Residents are eligible for a 90% discount. The generated revenues are to be spent in public transport, mainly the bus service.

Various adjustments have been made to the scheme since it was first introduced in February 2003. For example, the charge has been increased to £8 from July 2005 onwards. Furthermore, changes in exemption and discounts have been made, fleet management has been introduced and new payment procedures and channels such as “pay next day” have been launched (see TfL, 2005 for details). The biggest changes however will be the extension of the congestion scheme to inner city areas westwards of the current zone (referred to as western extension). The implementation is commenced in February 2007. At the same time the charging hours will be shortened by 30 minutes to 7.00am – 6.00pm.

The outcomes of the scheme so far have met or even exceeded the expectations prior implementation. Congestion in charging zone has decreased up to 26%. The overall traffic entering the charging zone has been reduced by 18%. Taking only private cars into account traffic volume has fallen about 37%. The majority of travellers has switched to public transport. Especially the bus service has considerably extended with the start of the scheme to cope with addition passengers. The number of bus passengers has increased up to 37 percent during charging hours. Around half of this was assessed to have been as a result of the scheme. Bus reliability also improved on routes in and around the charging zone after the introduction of the scheme. Excess waiting time fell by 30 percent in the first year and by a further 18 percent in the second year after the introduction of congestion charging. Although not an objective of the congestion charging positive effects have been observed for traffic safety and the environment. That means a decrease in road traffic accidents and well as emissions were measures (see TfL, 2006 for more details).

The implementation of the congestion charging scheme was prepared by the Greater London Authority (GLA) Act enacted in 1999. With this law the Government provided the legislative power to establish the office of the Mayor of London, the Greater London Authority and Transport for London (TfL), the public body responsible for managing transport in London and thus the opportunity to introduce an urban road pricing scheme in London. A possible scheme, including definition of the boundaries, technology and enforcement, would be the responsibility of the Mayor and TfL. The GLA Act requires only that the net revenues of the scheme must be invested in transport projects in London (Dix, 2002).

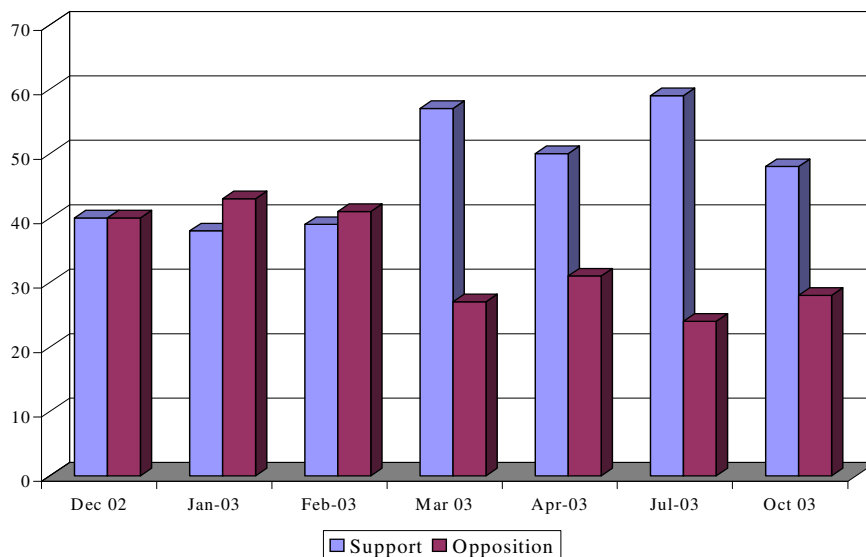
In March 2000, the Government Office for London published a report entitled “Road Charging Options for London: A Technical Assessment” (Dix, 2002). This report was intended to assist mayoral candidates in the understanding of the contribution that road user charging and workplace parking levies could make to the Mayor's initial Transport Strategy. It examines the sort of schemes that might be developed or introduced in the Mayor's first term. The report was prepared by an independent working group of transport professionals assisted by studies from a team of consultants under contract to the Government Office for London.

In the following election campaign the current mayor Ken Livingstone included proposals for a congestion charging scheme in his election manifesto and won the election in May 2000. Londoners voted for him knowing that he would probably implement congestion charging, as he did in 2003. Prior to the introduction an extensive public consultation process took place on the overall transport strategy including charging and the proposed congestion charging scheme itself. Within this consultation process the public and key stakeholders were given the opportunity to comment on the proposals and request changes. The final decision however was taken by the Mayor himself, in contrast to Edinburgh, where the final decision rested on a public referendum. Any further changes would go through a similar public consultation process. For example, in February 2004, TfL issued a consultation document on the expansion of the charging zone to the west. Following Livingstone's re-election in the June 2004, in August 2004 the results of the public consultation were published. In May 2005 TfL announced a further consultation period with specific proposals about the extensions. At the end of September 2005 the western expansion of the congestion charge was confirmed to come into effect in February 2007.

Figure C-3 illustrates the level of acceptability of the London Congestion Charging Scheme before and after the implementation. The level of acceptability of road user charging before the introduction was rather stable about 40%. This also holds true in comparison with other scenarios such as workplace levy schemes (GOL, 2000). After the introduction acceptability has risen above 50%. Unfortunately, no time series data is available later than October 2003 to observe any long-term trends in acceptability and the influence changes to the schemes, such as the western extension, might have. The re-election of the Mayor in June 2004 with the western extension already announced suggests that London residents accepted this change as part of their future government as well.

There are two main reasons for this rather high level of acceptability before as well as after the introduction. First, traffic levels in London had reached unacceptable levels and Londoners felt some radical measure was needed. Evidence for this is cited in the ROCOL report (2000): 90% of London residents, polled in 1999, thought that there was too much traffic in the capital, and were concerned about its impacts on travel times and air pollution. Some 41% of a representative sample polled for the ROCOL report also felt that a congestion charge was the best way to raise money for improved public transport in London. A consultation on congestion charging carried out by TfL for the Mayor in July 2000 found that, of 400 key "stakeholders", six times as many supported the concept of a central London congestion charge as opposed it.

Figure C-3 Level of Support for London Congestion Charging Scheme over Time



Source: Adapted from TfLS, 2004

Second, in London the concentration of power in the hands of the Mayor meant that “local” political concerns were less important, and thus resources could be concentrated on key projects, such as the implementation of congestion charging. In doing that the TfL and the mayor himself did an excellent job of engendering trust through open communications, a clear and well-composed presentation of the problem and the proposal, and the development of first-rate communication tools, including a highly effective website. In this way consultation as well as promotion of the scheme and its benefits was achieved.

The legislation that permits the Mayor to implement congestion charging in London is also different to that which gives the same power to local authorities in Scotland (Transport (Scotland) Act 2001); and in England and Wales (Transport Act 2000). In London, the decision rests with the Mayor, without reference to a higher level of government. Another factor that might have helped is the political stability. For example, no sustained and organized opposition to the proposal has emerged. Furthermore, the fact that congestion charging was implemented early in the Mayor’s term of office gave it more chance to succeed (Rye, Ison and Santos, 2003). In summary, a high level of public acceptability together with strong political commitment made it possible to introduce congestion charging in London.

C-3 EDINBURGH

The congestion charging scheme proposed by the City of Edinburgh Council aimed at reducing congestion and raise revenues to improve public transport. The scheme consisted of two cordons and a £2 charge for inbound travel. The charge would have applied between Monday and Friday, during the day (7am–6.30pm) for the inner cordon and morning peak for the outer cordon (7am–10am). Vehicle exemptions included emergency service vehicles, motorcycles, local buses, Blue Badge holders (disabled) and City Car Club vehicles. City of Edinburgh Council area residents living outside the outer cordon were exempted from paying to cross the outer cordon.

The implementation process included a comprehensive programme of consultation and market research divided into four phases followed by a public referendum prior to the start of the scheme. Phase I of the consultation strategy, conducted by the Council in 1999, aimed to determine public preferences for the basis for the future transport strategy. Significant public support for the high investment option, based around road pricing implementation, was taken as a mandate to proceed with this design (Saunders, 2005).

The Phase II exercise, conducted in 2000, started the design process. It was decided at this initial stage to divide the road pricing scheme into a series of individual design elements, providing a series of options for each one, and then assess the level of consensus in each case. Public consensus did exist on two different design elements: the charging basis (an entry permit design) and the days of operation (Monday to Friday). These elements were subsequently adopted into the scheme design (Cain *et al.*, 2001).

Phase III presented a series of charging scheme options, each featuring different design configurations, in order to develop an understanding of public preferences for an overall scheme design. It was found that the charge level was the major determinant of level of support, with the most popular charging options being those that minimized the charge level. Other factors in the transport strategy design, such as whether a single or double cordon is employed, the length of the charging period or the kind of transport improvement package provided, were less important in influencing respondents’ overall level of support. Charging options at the £1 and £2 (around € 1.50 / € 3.00) levels both received majority support (Cain *et al.*, 2002).

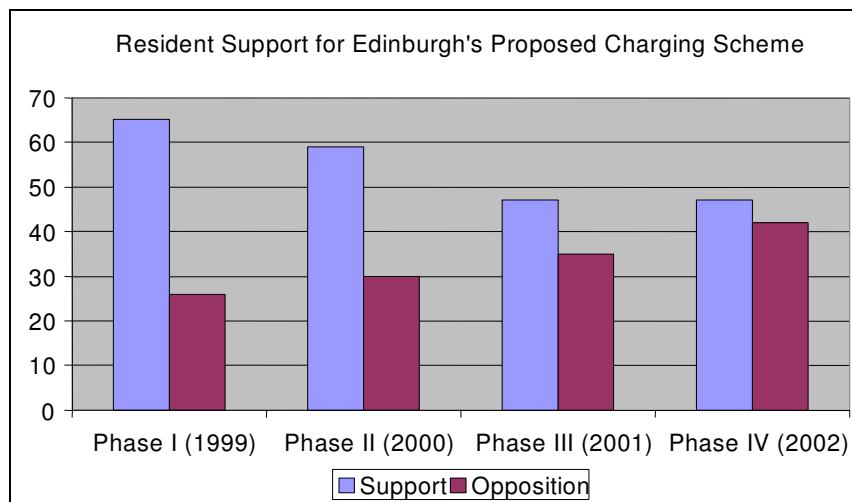
The Phase IV exercise was designed as a full, open public consultation, with residents of south-east Scotland invited to comment on the proposals and state their preference between two road pricing based options and a no charging option. Setting the charge level of both options at £2 meant that other elements of the design would have a greater influence. In this case it was found that the single cordon option was much more publicly acceptable than the

double cordon, with the single cordon receiving approximately equal levels of support and opposition, while the double cordon received net opposition of between 20 and 42 percent (Cain *et al.*, 2002a).

Despite the lack of public support for a double cordon design, the Council decided to base its preferred design on this option, due to this design's ability to influence city-wide congestion levels and to fund region-wide traffic improvements. Conceding that the double cordon in its current form was unacceptable, the council reduced the outer cordon charging period to during the peak periods only.

As Figure C-4 illustrates public acceptability towards the congestion charging proposals declined in Edinburgh over the four public consultation phases (PRoGR€SS, 2004). In 1999, there was approximately 60% support and 30% opposition for the charging principle identified in Consultation Phase I 'Edinburgh's transport choices'. In 2002, the level of support had fallen, at the time of the Consultation Phase IV 'Have Your Say'. The option for a single, central cordon had marginal opposition amongst Edinburgh residents (43% in favour, 47% against), whereas the option for two cordons (the option presented to the public in the referendum) had stronger opposition amongst Edinburgh residents (34% in favour, 56% against). As shown by the referendum result, support for congestion charging in Edinburgh declined further after Consultation Phase IV. The referendum in February 2005 resulted in a 65% rejection of the proposed charging scheme leading to a full stop of all implementation work by the City of Edinburgh Council.

Figure C-4 Level of Support for Edinburgh's Road Pricing Scheme over Time



Source: PRoGR€SS, 2004

Follow up-studies by Allen *et al.* (2006), Braunholtz and Cuming (2006) and Gaunt, Rye and Allen (2007) have identified a number of reasons for the strong opposition and the subsequent failure of the Edinburgh congestion charging scheme. First of all, car users strongly opposed the scheme while non-car users did not exhibit equally strong support. Car users were also more motivated to vote than non-car users. Especially bus users, perhaps the groups likely to benefit most from congestion charging, did not support the scheme as expected. By the time the referendum took place, a number of transport improvements have been implemented. However it seems that by polling day these improvements had either already been forgotten about or else people thought that these improvements were not relevant to them, or did not see them as linked to the charging scheme. But also at the time of the referendum the plans for public transport improvements funded by the revenues were not well-developed and therefore quite difficult to "sell" to the public.

A second important factor were the wide held misconceptions about how the scheme would operate, the amount of charge and the specific location of the charging schemes. Only half of the respondents in the survey mentioned above were able to state the correct level of charge per day (£2). The greatest individual misconceptions were that the maximum daily charge was dependent on whether entering the charged areas more than once. Furthermore, there was a misconception that the cordons were operational in both directions (in practice they were only inbound cordons). These misconceptions therefore tended to exaggerate the level of charge and the applicability of the charge and certainly further increased the opposition.

These factors are compounded by an apparent widespread distrust of the Council. Over a third of residents felt the Council is anti-car, illustrated for example by a perception that the Council's bus priority and traffic calming measures are designed to "generate congestion" (Saunders, 2005). Only 25% of the respondents were convinced that all the revenues raised from the scheme would have been used to improve transport in Edinburgh. In addition, only a minority felt the Council is finding good solutions to the issue of traffic in Edinburgh. Furthermore low overall political support might have reinforced this negative image. "The administration's overall majority of just two seats will have had the effect of politicising the issue, with opposition parties taking the opportunity to seek potential future electoral advantage" (Saunders, 2005).

C-4 STOCKHOLM

Road pricing has been on the political agenda for Stockholm since the late 1960s. The congestion charging field trial carried out in 2006 was the latest event in a long series. Already in 1991 politicians of at that time the three leading parties in the City and County of Stockholm reached an agreement on a comprehensive transport investment package. The so-called Dennis-package comprised road and public transport investments combined with a system of road tolls. It was finally adopted in September 1992. However the political priorities of the three parties involved were quite diverse and all other parties opposed the agreement. Especially controversial were the toll ring and the two major road infrastructure projects. The 1994 election resulted in new political power balance in which the Social Democrats relied on support from parties opposing the Dennis-package. In the following the Dennis-agreement was terminated (Harsman, 2003).

In 2002 the National Green Party won a crucial position in the national elections. In the following coalition building process the Green and the Social Democratic party agreed on the implementation of a 'full-scale' road tolling trial in Stockholm. The government fulfilled its promise in April 2004 in a bill presenting a law on congestion taxes. The congestion charges act is general, but has a supplement regulating the terms of a temporary full-scale trial in Stockholm. It passed the parliament in June 2004. Unlike the previous Dennis agreement, where road tolls were primarily seen as instrument for infrastructure funding, the focus is now in travel demand management and congestion reduction.

In the agreement with the Green and Left parties, the trial was described as a full-scale trial that would last for several years. However, as the Social Democratic leadership in Stockholm wanted to have this issue sorted out before the next election campaign, the city council decided to follow-up the trial with a local referendum together with the next election in September 2006. Since, the trial would have to be completed before that date, the Social Democratic, Left and Green parties agreed to conduct the trial over a 14-month period from the beginning of June 2005 to the end of July 2006. Several delays in the procurement procedure made it necessary to postpone the start. Finally, the road pricing trial in Stockholm lasted 7 months, from the 3rd January to the 31st of July 2006. The referendum whether or not the congestion charge should be permanent was held on the 17th of September on connection with the general elections (Armenius, 2006).

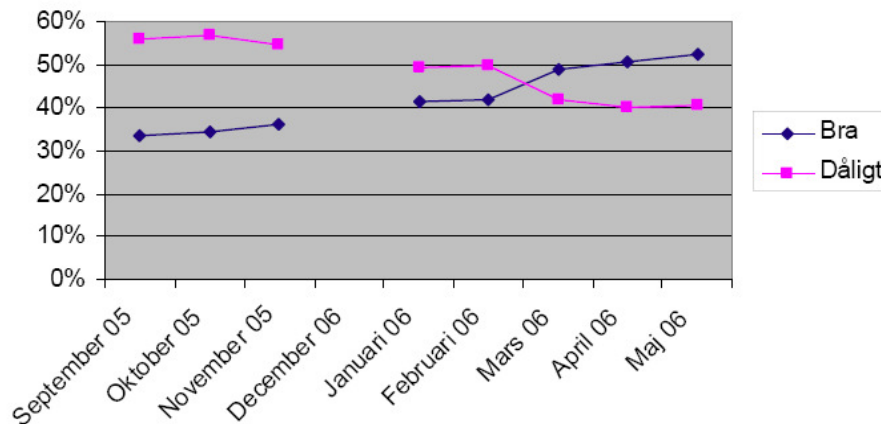
The road pricing system in Stockholm represents a cordon system around the inner city with 18 control points charging motorists for entering and leaving the centre of Stockholm. The charge is raised on weekdays from 7.30am to 6.30pm with no charging the evening, the

weekend and on holidays. The charge is highly differentiated according to the time of travel with 2€ at peak-hours, 1.50€ at semi peak-hours and 1€ at non-peak hours. The maximum charge per day is 6€. A number of exemptions exist such as for emergency vehicles, disables persons, taxis, and vehicles using alternative fuel. A number of payment channels have been installed among others electronic payment with transponders installed in vehicles. In parallel considerable public transport improvements such as new bus lines and additional buses as well as new Park and Ride facilities have been launched already in 2005.

So far the congestion charging scheme impacts meet or exceeded similar expectations to London. Traffic volume declined between 9% and 26%. The decline was biggest during the peak-hours with the highest charges. The biggest decline of all was during the afternoon/evening peak-hour, which can be probably be partly explained by the fact that during the afternoon travel is not dictated to the same extent by time and destination as in the morning peak-hour. Traffic also declined during evenings after the charging period. Fears that bypass routes would collapse were unfounded. Subsequently positive environmental and safety effects were registered. Congestion rose at the end of April in line with the annual spring increase in traffic and it has been discussed whether this was due to the effects of the congestion tax declining over time (City of Stockholm, 2006). However, traffic counts after the trial period show an increase in traffic volume almost to the same level than before the trial. The public transport improvements lead to an increase of 6% travel in all public transport services. In the inner city the increase was around 9%. This numbers are in the range of expected demand increase of 7-8% of trips in the direction towards the inner city. However, they are not attributed to the congestion tax only, but also to the rise of petrol price sand the general economic development.

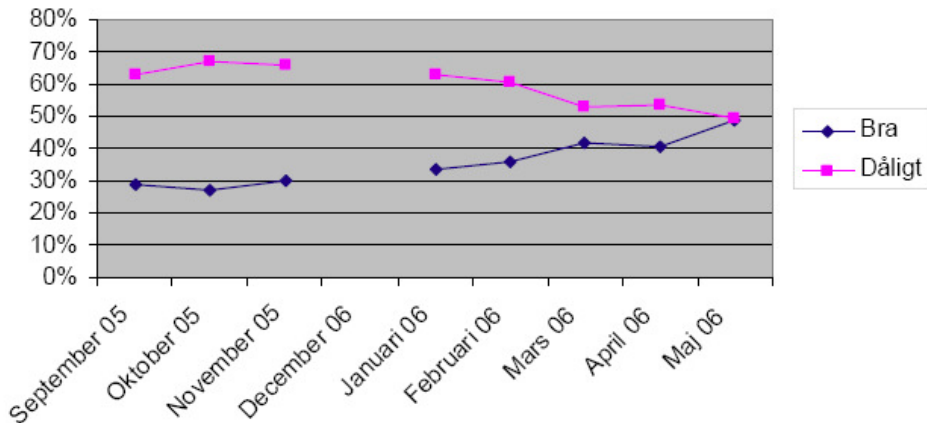
Public acceptability has been measured before and throughout the trial period. The pattern of response is quite similar to what is known from London and the Norwegian cities (see Figure C-5). Attitudes to the Stockholm Trial have become more positive during this time. In autumn 2005, about 55% of all county citizens believed that it was a “rather/very bad decision” to conduct the congestion-tax trial. Since the congestion tax was introduced in January 2006, this percentage has continuously fallen. In April and May 2006, 53% believed that it was a “rather/very good decision” while 41% believed that it was a “rather/very bad decision”. Significantly, even those travelling by car to/from the inner city during the charge period in the most recent two 24-hour periods have become more positive by several percentage units. In May 2006 car driver were approximately equally for and against the road pricing trial (see Figure C-6).

Figure C-5 Attitude change towards the Stockholm road pricing trial



Source: (Söderholm, 2006)

Figure C-6 Attitude change of car drivers towards the Stockholm road pricing trial



Source: (Söderholm, 2006)

The following referendum resulted in a 51.3% support for the charging scheme. 45.5% voted against the scheme (City of Stockholm, 2006a) Municipalities surrounding Stockholm were not satisfied with the fact that their residents were not eligible to vote. A substantial number of them travel to and from work through the congestion tax area. Therefore several of these municipalities, especially those governed by at that time opposition party have decided to hold an advisory referendum. Here the majority of residents decided against the permanent introduction of congestion charging in Stockholm (see Figure C-7). It seems that those people who benefit most from urban road pricing can be convinced if they experience in a trial the positive outcomes. However, not all municipalities held an independent referendum and the wording of the question there was different from the official Stockholm referendum. These could also be reasons for the differences in the referendum results. Additional analyses and interpretations of the acceptability developments in Stockholm have been done by e.g. Vagland and Byström (2007) and Stathopoulos (2007).

Figure C-7 Results of the Stockholm Referendum in September 2006

