

Road Pricing: Overview

Sittha Jaensirisak (PhD)

Assistant Professor

Department of Civil Engineering

Ubon Ratchathani University

Structure of presentation

- Background
- What and Why road pricing?
- Road pricing experiences
 - Singapore
 - London
 - Stockholm
- Learning from the experiences
- Conclusions

Background

- Transport problems in most cities around the world are serious and getting worse.
- This worsens the environment and degrades the quality of life by making travel unreliable and frustrating.
- Increase of the supply alone would be not possible to cope with increase of travel demand.
- Public transport provision and improvement are not sufficient.
- On the contrary, the demand of car use should be restricted.

What is road pricing?

- Road pricing, in general, is a transport policy for charging motorists a fee for using their vehicles within specific areas or on specific roads.
- The term road pricing has been used to cover any fiscal form of traffic restraint including both direct and indirect charges of road users.
- Other names: road user charging and congestion charging.

Why road pricing?

- It is able to cope with the growth of car travel demand.
- It is to generate revenue for transport projects.
- Other policies fail to deal with transport problems.

From theory

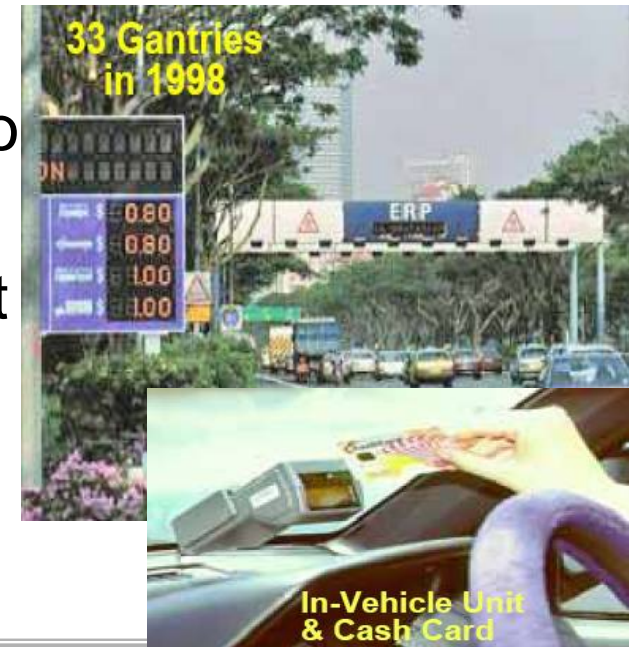
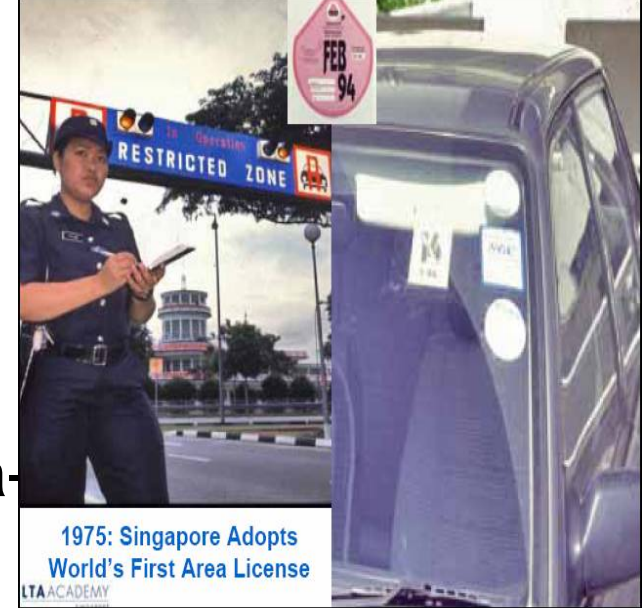
- Adam Smith (1776) mentioned that services should be paid for by those who benefit from them.
- Dupuit (1844) by using a simple example of the imposition of a toll on a footbridge, demonstrated efficiency of pricing.
- Marshall (1890) Pigou (1920) and Knight (1924) pointed out the marginal pricing concept.
- Walters (1954) clearly suggested that “motor taxation should be levied so that the marginal private cost of vehicle operation is brought nearer to the marginal social costs and the degree of congestion on our roads is reduced”.
- Vickrey (1955) also stated that marginal cost should be concerned in an elaboration of any scheme of prices in order to achieve the efficient utilisation of facilities.
- In the UK, the Smeed Report (Ministry of Transport, 1964) was the first full contribution of the theory of road pricing to policy implementation.

Implementation experiences

- During the 1970s, the 'supplementary licensing' scheme for London.
- In 1975, the Area Licensing Scheme (ALS) in **Singapore**.
- In 1985 an electronic road pricing was on trial in Hong Kong.
- Norway's toll rings were installed around Bergen in 1986, Oslo in 1990, and Trondheim in 1991.
- In 1988 the Netherlands Government developed a proposal for a road pricing implementation in the region called 'Randstad'.
- During 1980-2000 in UK, several local authorities, e.g. Bristol, Cambridge, Derby, Edinburgh, and Leeds were interested in road pricing.
- On 17 February 2003, **London** Congestion Charging scheme has been implemented.
- During 1991-1997, the Swedish Government tried to introduce tolls around Stockholm.
- On 1 August 2007, the **Stockholm** Congestion Tax came into effect

Singapore's road pricing

- Singapore introduced urban road pricing in 1975.
- Initially, the system applied was Area-Licensing Scheme (ALS).
- In 1998, the ALS was replaced by Electronic Road Pricing (ERP).
- The tolls would be varied according to the average speed on the network.
- Prices applied under ERP are subject to maintain traffic speeds of
 - 20-30 km/h on arterial roads, and
 - 45-65 km/h on expressways.



Singapore's road pricing



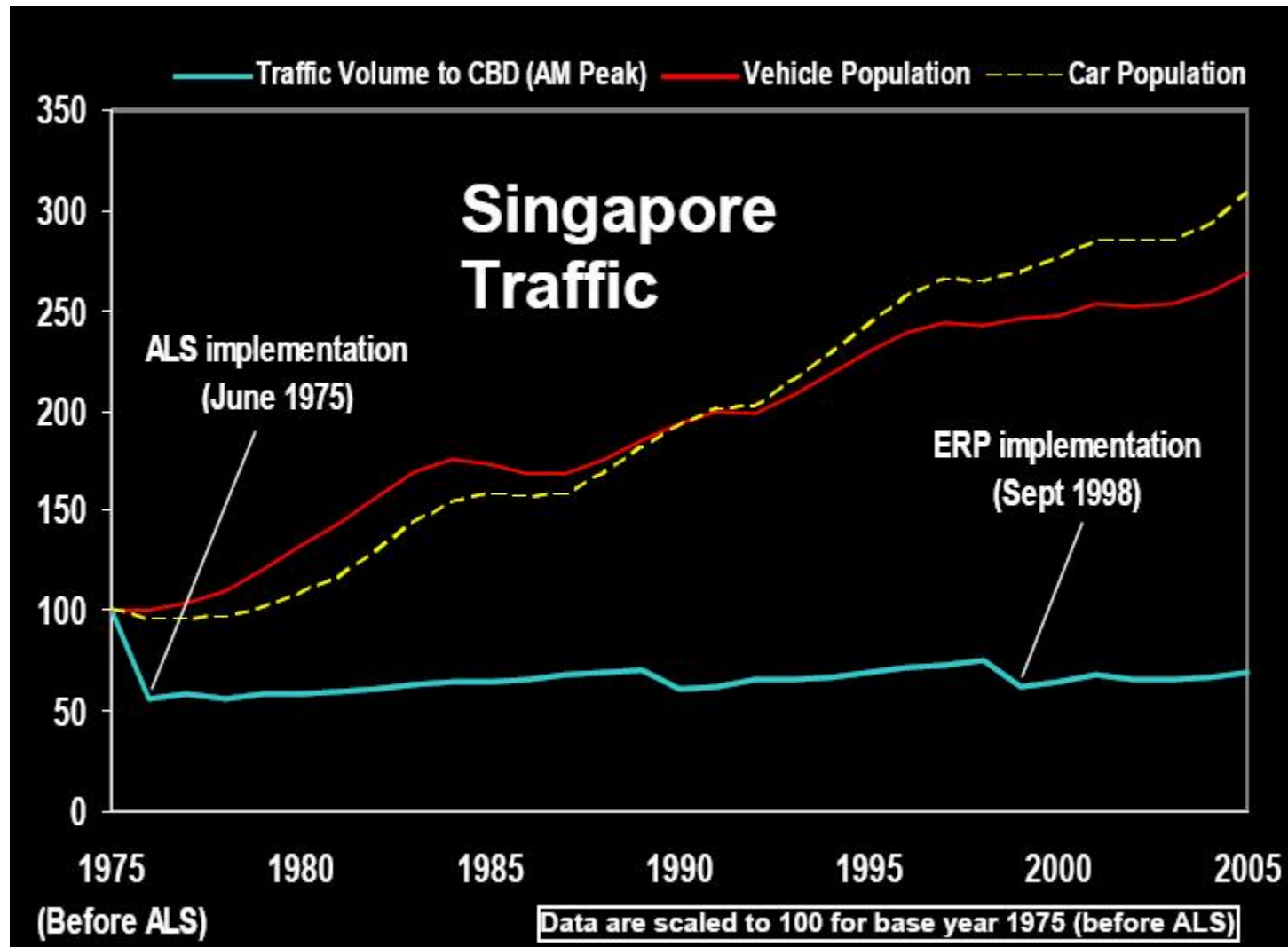
Source: LTA, Singapore

Singapore in 1970



Source: LTA, Singapore

Managing Traffic Growth



Source: LTA, Singapore

London Congestion Charging

London Underground 408 km. with population 7.5m



- Bounded by the Inner Ring Road
- 7am-6:30pm, Mon.-Fri. excluding Public Holidays
- £8 per vehicle per day (£5 before 4 June 2005)
- Impacts
 - 30% less congestion
 - 21% less traffic
 - Better bus service
 - Net revenue about USD\$250m per year for public transport

Source: Transport for London

History of London Congestion Charging

- **In the early 1960s**, 'Smeed report' - the technical feasibility of various methods for pricing systems. (Ministry of Transport)
- In the 1970s, the Greater London Council (GLC) proposed the charging system called 'supplementary licensing'.
- In the 1980s the London Planning Advisor Committee (LPAC) concluded that improvement of public transport by itself was not seen as sufficient; Congestion charging was seen as the most favourable.
- During the early 1990s, 'The London Congestion Charging Research Programme' was sponsored by the Department of Transport to study various charging systems.
- In 1998, Road Charging Options for London (ROCOL) study forms the basis for the today London Congestion Charging Scheme.
- In 1999, the Greater London Authority (GLA) Act provides full powers for the Mayor to introduce congestion charging schemes in Greater London.
- In May 2000, Mr. Ken Livingstone was elected to be the Mayor of London, and promise to introduce a congestion charging scheme in central London.
- **Finally, the congestion charging scheme went live on 17th February 2003.**

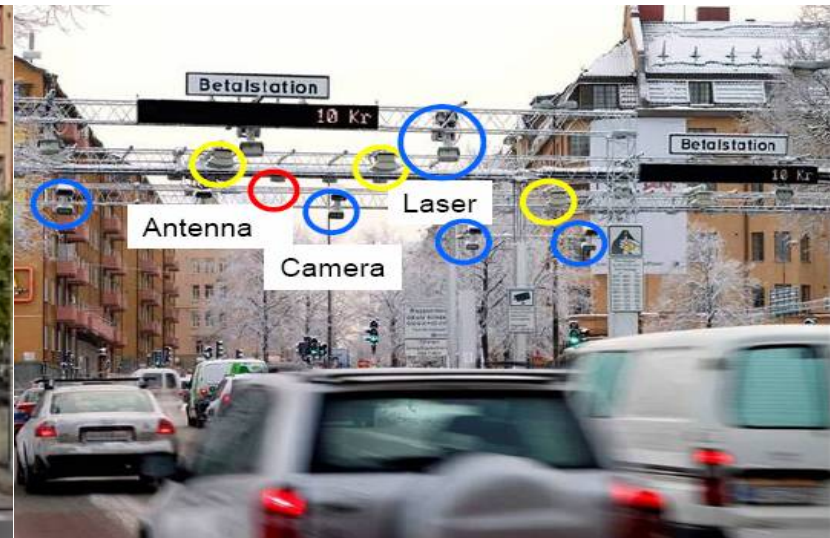
Source: IEA Saving Oils and Reducing CO Emission in Transport (2001)

Learning from London

- This case illustrates the factors of political leadership and timing of the implementation.
- The scheme in London provide details on how to handle public and political acceptability problems.
- The legislation process to promote and support road pricing policy: e.g.
 - approving several legislations to allow for the introduction of road pricing scheme and enable the local authority to utilize the revenues,
 - offering an advance budget for developing major public transport infrastructures.

Sweden

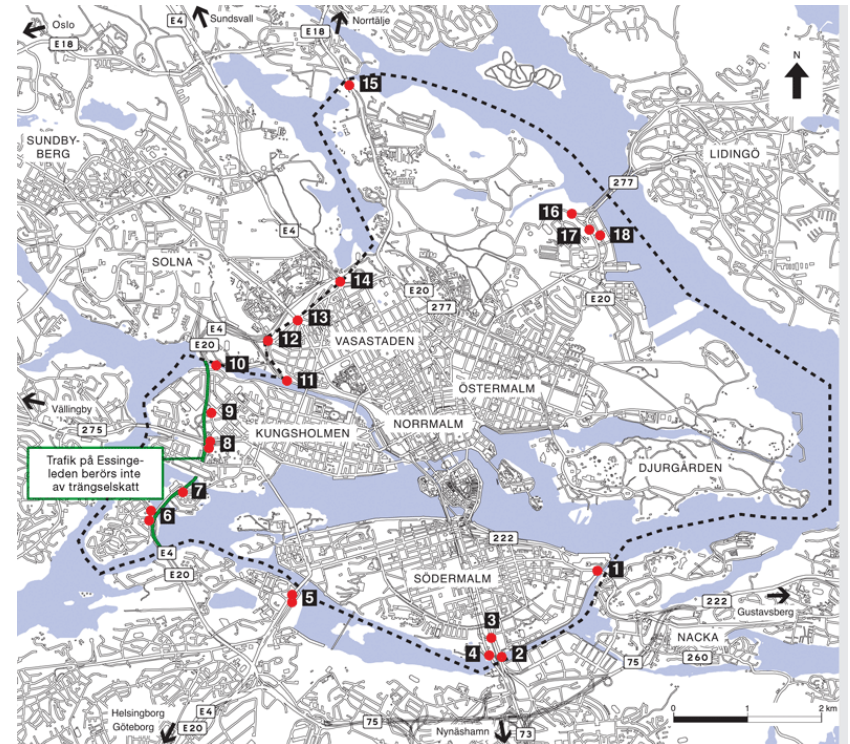
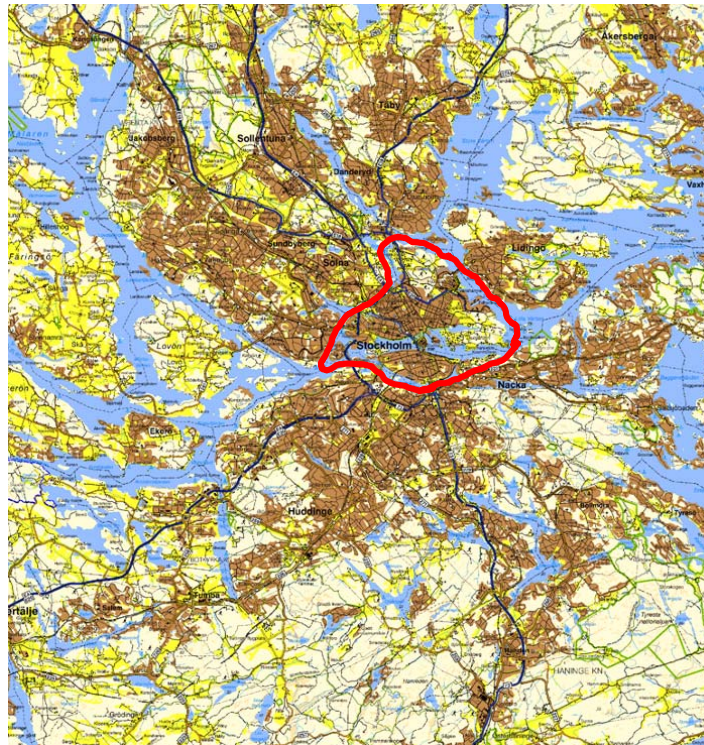
- **Stockholm congestion tax OR Stockholm congestion charge**
- Charging vehicles entering and exiting central Stockholm
- seven month trial period was held between January and July 2006
- to reduce congestion and pollution



Stockholm Congestion Tax

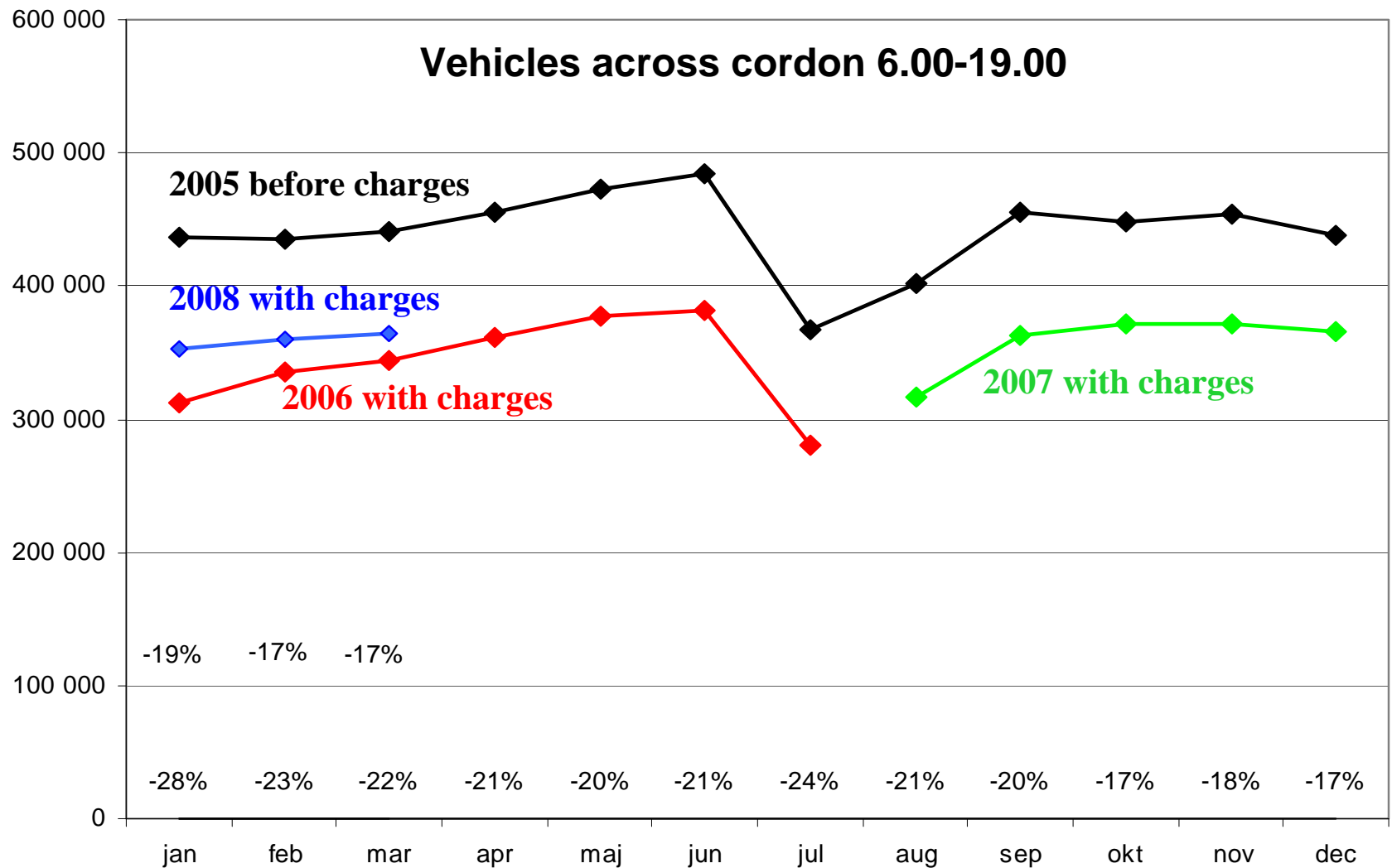
- A referendum was held in September 2006 (two months after the end of the trial period)
- In the referendum the residents of Stockholm municipality voted YES and in 14 other municipalities voted NO
- The parliament approved this on 20 June 2007
- The congestion tax came into effect on 1 August 2007
- This is a governmental tax, not a local tax (as municipalities in Sweden are not allowed to create new taxes).

The Stockholm congestion charges



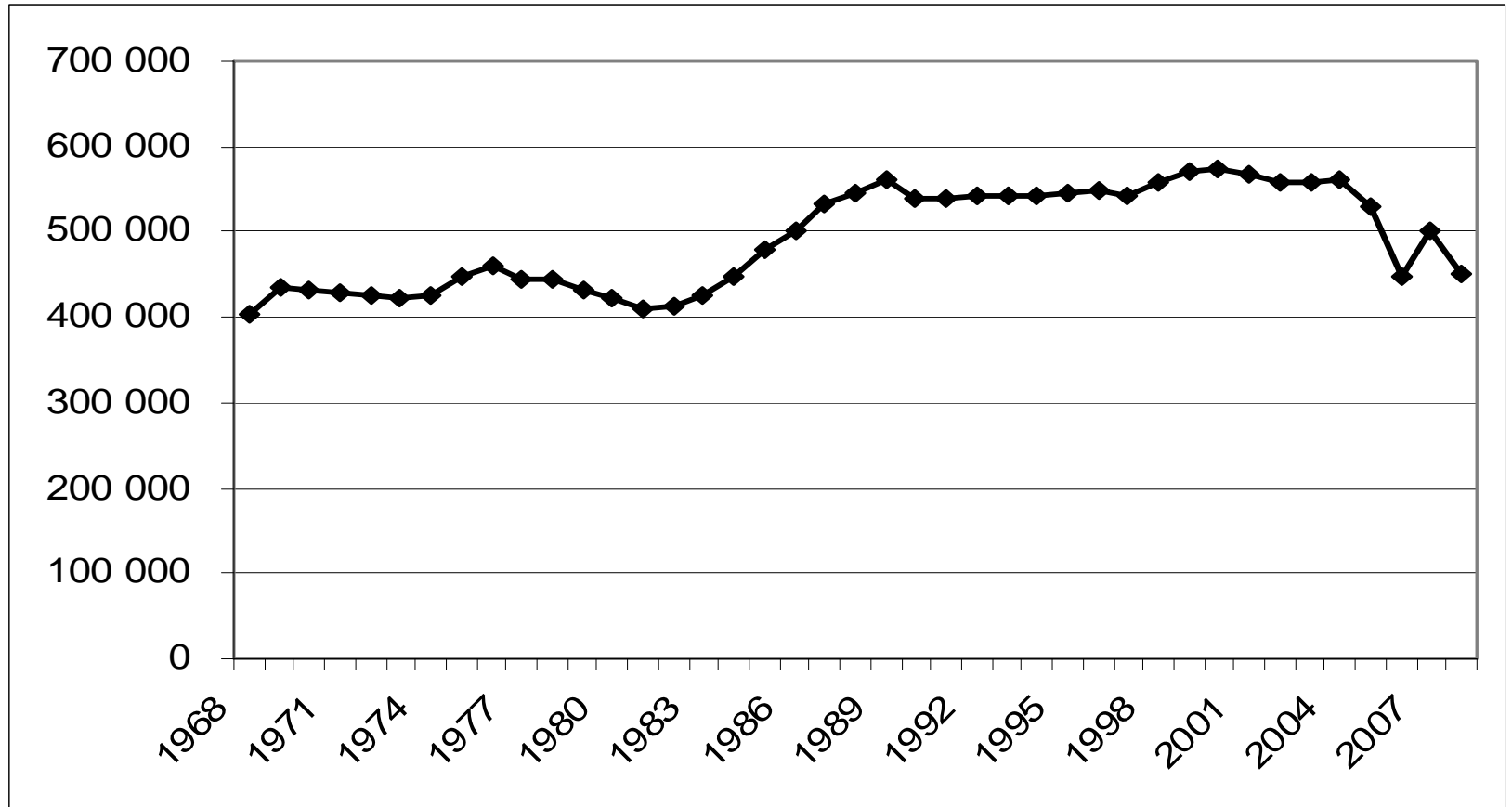
- Trial period during spring 2006
- Referendum Sept 2006 – “yes”
- Reintroduced Aug 2007
- Large positive majority now (~70%)
- 10-20 SEK (1-2 €) per cordon crossing, depending on time of day
- No charge evenings or weekends
- Alternative-fuel cars exempt
- Max 60 SEK/day

Stable traffic decrease $\approx 20\%$ across cordon



Sources: Prof. Jonas Eliasson

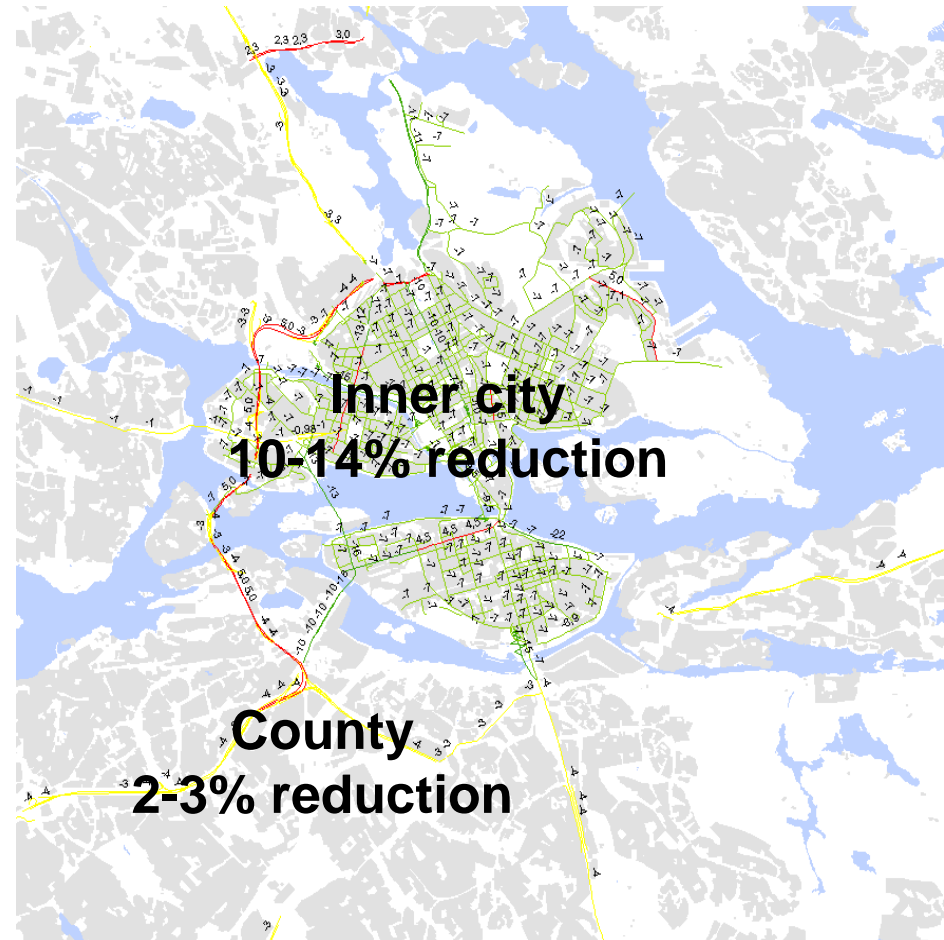
Significant change in traffic trend



Sources: Prof. Jonas Eliasson

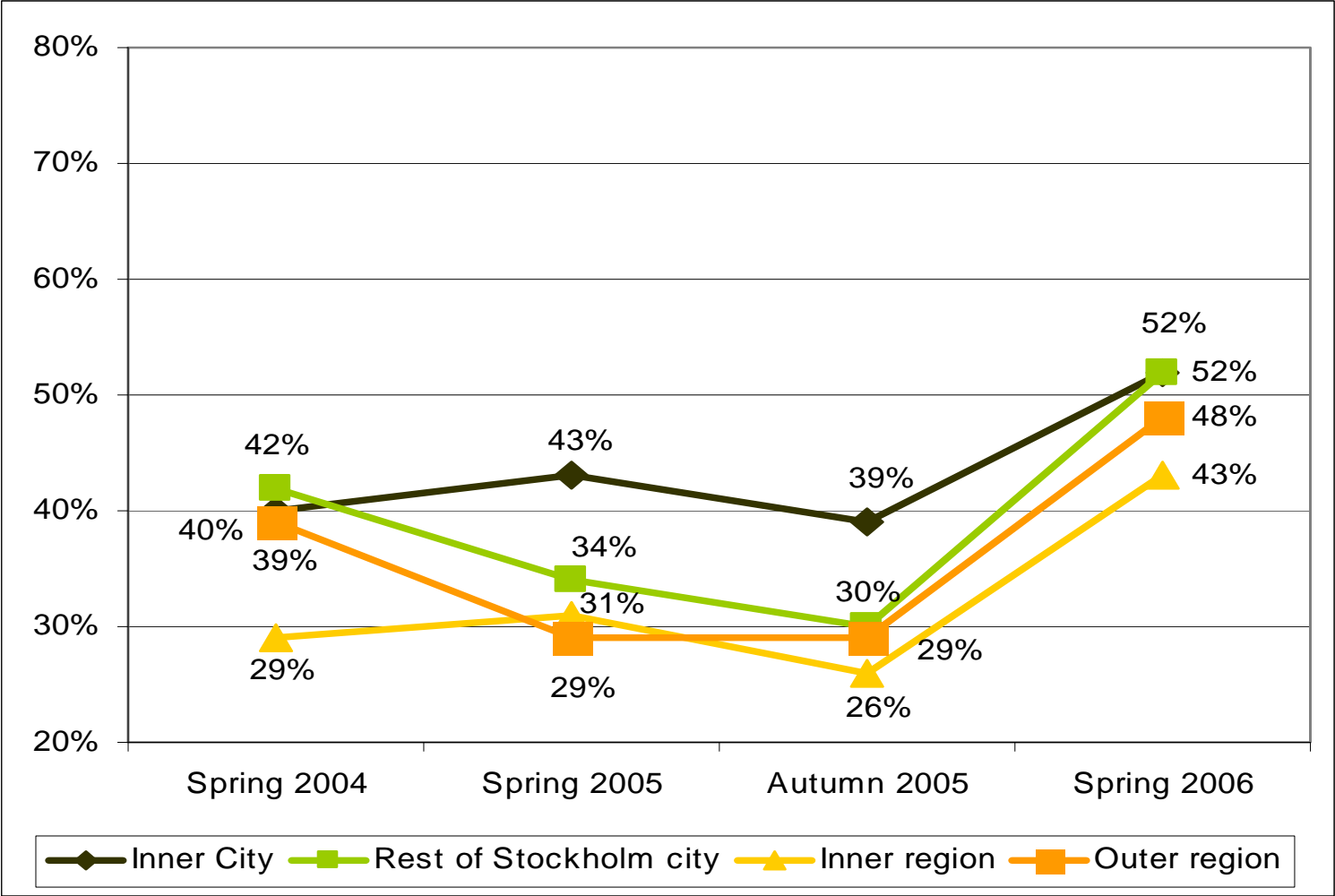
Less emissions

- 10-14% less emissions in the inner city
 - positive long-term health effects
 - significant reduction of exposure
- 2-3% less CO₂ emissions in the county



Sources: Prof. Jonas Eliasson

Public opinion



Sources: Prof. Jonas Eliasson

Learning from the experiences

- Road pricing is for **congested cities**.
- **Political leadership** is very important.
- **Objectives and benefits** have to be clear to the public.
- Road pricing must be as a **part of comprehensive policy package**.

Conclusions

- Different types of congestion charging can be used for different objectives.
- Several examples both successes and failures around the world.
- Experiences: politics, acceptance, technology, impacts.
- Learning from London's and Stockholm's experiences
- Many more studies and research programmes are needed for each individual city.