Ten years with congestion charges - the story from Stockholm



- 1. The system and how it all started
- 2. Challenges and acceptance
- 3. Effects
- 4. Recent developments

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The Capital of Scandinavia

1. The system and how it all started

The city of Stockholm



Capital 900 000 inhabitants Built on water Congestion charges and metro



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- Trial period during spring 2006
- Referendum Sept 2006 close "yes"
- Reintroduced Aug 2007
- Large positive majority now (~70%)
- 10-20 SEK (1-2 €) per cordon crossing, depending on time of day

(SEK)

0 kr

- No charge evenings or weekends
- Alternative-fuel cars were exempt
- Max 60 SEK per day
- Extended system in 2016 (11-35 SEK, max 105 SEK per day)



First transponders, later only ANPR

- Free-flow identification
- No driver action necessary
- Invoice each month pay manually or automatically
- Transponder handling
 expensive
- Automatic number plate recognition very effective





Milestones (1)

Late 1990's: An infrastructure package incl. road tolls falls

Sep 2002: General elections

Dec 2002: The City decides upon congestion charges

March 2003: Decision base for design and implementation

June 2003: City decision on design. Some changes (the Saltsjö-Mälar passage).

Dec 2003: Traffic forecasts for eight alternatives. Some changes (SM passage only mid-day, time-varying fees, Lidingö exemption).

April 2004: Legislation passes Parliament. Definitive design (no fee on SM, exempted vehicles).





Milestones (2)

June 2004: Consortium wins bid on hardware July 2004–Feb 2005: Court appeal Jan 2006–July 2006: Trial period Sept 2006: Referendum Aug 2007: Permanent introduction Jan 2016: Extended system introduced





What the politicians wanted initially

- Suitable reduction of traffic probably around 10-15 %
- Charges should be time-differentiated.
- Suitable with 4-5 geographical zones
- Several methods of payments should be possible
- The situation at Essingeleden (the major pass by) must not get worse
- A trial during several (more than one) years



Resulting primary objectives

•10-15 % less traffic to/from inner city

Increased accessibility

Decreased emissions

•Inhabitants should perceive an improved urban environment

In short:

"a more sustainable transport system" (Environmental fees, not congestion charges)

The effects of the trial were carefully measured





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The Stockholm Trial – three parts



Congestion charges

- Full scale trial Jan–July 2006
- Automatic system with transponders
- Permanent system from Aug 2007
- Revenues: to public transport during trial to road investments in permanent system





Extended public transport

- Started before
- 14 new bus lines, 18 bus lines with higher frequency, more and longer trains



Extended P&R

- Started before
- 2500 new park and ride places

2. Challenges and acceptance

Challenge 1: Finding a simple system without (too many) unwanted effects

Considerations:

Stockholms

tad

- Strong political bindings regarding design
- Place charging points where congestion is most severe
- Keep many alternatives open (to get maximum effect)
- Keep the number of charging points down (to reduce costs)
- Try to keep it "fair" and "reasonable"
 - geographical equity; not too high charges



Challenge 2: Finding acceptance

Factors that increase support: 1. Self-interest – "winner"

Respondents support congestion pricing less... ... the more they travel by car ... the less satisfied they are with public transport ... the more cars they own ... the more they anticipate to pay ... and the higher value of time they have! ... Not an income effect! 2. Environmental concerns

Trust in government, positive to public interventions
 Pricing viewed as "fair" allocation mechanism

Not whether congestion is seen as great problem *Not* equity concerns

Key acceptance problems for the trial

- Tolls not part of "strategy" or "package"
 - increased bus services introduced as an answer to this
- Most people do not "burn" for transport efficiency
- National government decides about charges and revenue use
 - the city tried to maintain a "high profile", claiming the initiative
- Sense of betrayal and mistrust among key stakeholders
 - long-term problem; completely locked political situation
- Referendum focused on "tolls yes/no", not congestion charging as part of a strategy, and was heavily influenced by the "broken promise" debate
 - advocates try to view CC as part of a regional strategy



Experiences from Stockholm

Create many winners, few losers

- Smart scheme design => large congestion relief
- Good and many alternatives => easy to avoid (*not just PT!*)
- Earmark revenues (self-interest + reduce "black hole" concerns)

Build "trust for the government"

• Transparent revenue use, system costs, process for deciding charge levels

Pricing should be viewed as a "natural" mechanism

- Scarce resources have to be allocated somehow, right?
- Not just a "tax" an allocation mechanism
- Frame it like a "fare" or a "user pays" charge ?

Play the environment card

• Many burn for the environment – few burn for "efficient use of road space"



Key experience – apparent effects helped





Completely changed media attitude





"Charges heading for the ditch" "Bypass threatened by chaos" "Charging chaos continues"



Stockholms stad "Stockholm loves the charges"

"Charges a success"

"Thumbs up for the charges"

"Familiarity breeds acceptability"





Stockholmers more used to pricing?



Stockholms stad

3. Effects

20 per cent less traffic

- ... lasting effect
- ... lots of people liked the alternatives



Less traffic even outside cordon ... and forecasts worked

Yellow square - forecast

Bars - Outcome





The effect increases for each year

... when adjusting for inflation, population growth, exceptions etc.

	2006	2007	2008	2009	2010	2011
Mean fee per passage (2006 prices)	12:80	10:60	10:40	10:60	10:30	9:90
Decrease in paying traffic, adjusted for change in population etc.	-29.7%	-27.5%	-28.1%	-30.7%	-29.8%	-29.8%
Elasticity	-0.70	-0.74	-0.77	-0.85	-0.83	-0.86



30-50% less time in queues April 2005/2006





What happened to disappearing traffic?



Car work trips:

- 24% changed to transit,
- 1% changed route

Car "other" trips:

- 21% "disappeared"
- 1% changed route

Professional traffic:

- 15% "disappeared" (route and logistics changes)

No measurable effect on retail



People can't predict or remember their own behaviour – or opinions

Predicted and actual change (private trips):Respondents' own predicted change:~5-10% less trafficActual measured change:~30% less trafficRespondents' own reported change:~5-10% less traffic

Attitude change: "I became more positive during the trial"

- March 2006 (during trial): 29%
- Nov 2007 (a year after trial): 13%



Who pay the most?

- Inner city residents pay twice as much as the rest in the county
- "Rich" households pay three times as much as "poor" households
- Employed pay three times as much as the rest
- Men pay twice as much as women
- Households with children or two adults pay 50% more than the rest (per person)





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





4. Recent developments New congestion tax from 2016







10 % reduction forecasted on Essingeleden





Preliminary effects from the new charges - car flows

Charged period (06:30-18:30)	Forecast	Prel. Change (first week) Adjusted for season
Inner city cordon	-6 %	-5 %
Essingeleden	-8 %	-8 %



Preliminary effects – travel times



Sum up

- Extremely polarized debate before the trial
 - The technical system worked
 - Visible congestion reductions
 - Extensive scientific evaluation
 - Clear objectives that were reached
 - "Fair and efficient" design, consistent with stated objectives
- The referendum took away most remaining opposition
- Today uncontroversial even high raises



