The Stockholm congestion charging trial – what happened?

Expert group summary
Expert group

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The expert’s challenge

- To give a summary of the complete picture
- Thoroughly scrutinize the results, methodologies and conclusions
- Concluding summary of results and observations from all rapports

- Taken into account surrounding world, methodology, samples etc etc
- All reports fairly consistent
Comprehensive and detailed evaluation

- Travel survey Stockholm county (August)
- Travel survey Mälardalen
- Car traffic
- Cordon passages
- GPS – travel times
- Queue lengths
- Public transit (August)
- Parking
- Cycle and walk (cycle in August)
- Traffic safety

- Experienced environment
- City life (August)
- Air quality
- Emissions
- Noise

- Retail and visiting
- Taxi/deliveries/mobility service
- Workmen, driving schools
- Deliveries, garbage collecting
- Case study: Two workplaces

- Childrens sports activities

- Cost-benefit analysis (equity effects in August)

- Regional economic analysis

- Log of special events
Today:

overview and samples!

- three seminars next week
- expert group and project managers at your disposal
Questions before the trial

- Adaptation to charges – but how?
- Short trial period – better not change?
- Effects noticeable at the mere sight?
- Will Essingeleden (the ring road) cope?
- Will the transit system cope?
Goals essentially reached

- 10 - 15 % less traffic to/from inner city
  - Was 20-25%
- Increased accessibility
  - Queue times down 30-50%, except Essingeleden
- Decreased emissions
  - 14% less in inner city; 2,5% in total county
- Inhabitants should perceive an improved urban environment
  - Unclear – difficult to define and measure
Effects on car traffic and congestion
Effects stabilised quickly

Passager över avgiftssnittet kl 6-19

-28% -24% -23%

-22% -22%

jan feb mar apr maj jun jul aug sept okt nov dec 2005 (beräknat) 2006 höstvardag 2005
Less traffic also further out and inside the cordon

-25%  -20%  -15%  -10%  -5%  0%  5%

- Streets inside
- Streets inside, large
- Main roads inside
- Cordon
- Inner main roads
- Outer main roads
- Streets, outside
- "Ring roads"
Unexpectedly small traffic increase on E4-Essingeleden

Graph showing traffic levels at different locations from January to July.

- Gröndalsbron
- Frösunda
- Midsommar-kransen

Comparing 2005 and 2006 data.
Effects on car traffic - prel. overview
30-50% less time in queues
Even larger effect on PM peak

![Graph showing delay time, PM peak](image-url)
Noticeable decrease of congestion

- Several studies show that reductions of congestion and travel time have been noticeable "with a naked eye"
  - deliveries, taxi etc.
  - attitude polls, cycle etc.
Essingeleden about the same – but Södra länken is worse

Travel time increase on Södra länken due to it being a new road
Effects on travel times – prel. overview
(AM peak)
Where have all the car drivers gone?
What do people do instead?

- Many different strategies – short and long term
- Some make fewer car trips, or change in other ways
- Others make use of the increased accessibility

...we don’t have all the answers yet!
Many different adaptation strategies

- Max. half of the car trips show up in public transport
- New park & ride facilities are used – but a small contribution
- Changed departure times not a large effect

- Several different ways to change travel pattern:
  - change route
  - change destination
  - trp chaining

- Commercial traffic has also adjusted
Public transport an important part

- Improved public transport alone cannot reduce car traffic
- More passengers, but transit congestion stays about the same – increased supply of transit plays a role
- Buses have higher speeds
- Park & ride spaces have been used
- Bus riders are satisfied with the new buses

...more answers in August.
- Traffic safety
- Environment
- Experienced urban environment
Improved traffic safety

- Less traffic means less accidents
- Higher speeds means worse impact but small effect as a whole
- The period is too short for proper analysis of registered accidents
- Estimated reduction of wounded/killed by 5 - 10% within the charging zone
Less carbon dioxide

- Climate effects large for a single measure
- One step towards national climate target

Inner city 10-14% reduction
County 2-3% reduction
Less emissions improve health

- Emissions are reduced in the “right” area
- According to new findings, as much as 30 premature deaths can be saved (app. 300 living years)
Noise – not much of an effect

- App 1 dBA, and at most 2 dBA
- 3 dBA the limit that can be heard
- BUT the number of disturbed by noise are reduced
Improved urban environment – hard to know...

- Hard to define "good urban environment"
- Hard to measure
- Bad luck with weather conditions

- Perceived air quality, congestion and traffic tempo have improved
- Perceived safety, noise unchanged
Experiencing the trial – attitude surveys
Progressively more positive attitude

- Only 7% of trips in the county are affected by the congestion charge
- Noticable travel time improvements
- The technical system works
- Attitudes towards trial as well as congestion tax more positive
  - Fairly/very good decision: 44% → 54%
  - Fairly/very bad decision: 51% → 42%
Business sector also more positive now

- From very negative to barely negative, on average
- Administration is a burden
- Shorter travel times valuable
Industry & commerce

- Well-functioning road transport important
  - Time gains valuable, but administration cumbersome

- Marginal influence on land use, real estate prices and regional economy compared to other factors

- No identifiable effects on retail at aggregate level
- Influence on households purchasing power negligible
## Cost-benefit analysis of the congestion charges

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shorter, more reliable travel times</td>
<td>590 mkr/year</td>
</tr>
<tr>
<td>Paid congestion charges</td>
<td>-760 mkr/year</td>
</tr>
<tr>
<td>Health and environment</td>
<td>90 mkr/year</td>
</tr>
<tr>
<td>Traffic safety</td>
<td>120 mkr/year</td>
</tr>
<tr>
<td>Revenues from congestion charges</td>
<td>760 mkr/year</td>
</tr>
<tr>
<td>Other revenues/costs</td>
<td>190 mkr/year</td>
</tr>
<tr>
<td>Maintenance and running costs</td>
<td>-220 mkr/year</td>
</tr>
<tr>
<td>Net benefit</td>
<td>760 mkr/year</td>
</tr>
<tr>
<td>Investment and running costs 2006</td>
<td>-2000 mkr</td>
</tr>
<tr>
<td>Shadow prices etc.</td>
<td>-1100 mkr</td>
</tr>
<tr>
<td><strong>Total initial cost</strong></td>
<td><strong>-3100 mkr</strong></td>
</tr>
</tbody>
</table>

Payback time: 4 years.
The congestion charge gives a net social surplus – but not the increased bus services

- The congestion charge gives a net social surplus of around 800 mSEK per year
  - The trial is a net social deficit
  - Since the investment is a sunk cost, it’s socially profitable to carry on
  - The benefits outweigh the investment cost in 4 years
  - Short "payback time” compared to road/rail investments (typically 15-25 years)

- The new bus services give a net social deficit
  - cost 520 mkr/year, shorter travel times worth 180 mkr/year
Conclusions and summary
Effects are large compared to other measures

- Western ring road: 15 billions
  - 14% less traffic over the inner city bridges
- Eastern ring road: 20 billions
  - 11% less traffic over the inner city bridges
- Zero public transport fare: 5 billions per år
  - 3% less car traffic in the county

- Doesn’t make sense to compare investments and congestion charges against each other
  - Congestion charge gives a financial surplus of 500 mSEK/year

- Complements, not substitute, both financially and from a traffic management perspective
Lessons learned

Better public transport cannot reduce road congestion on its own
  - No measurable car traffic reduction

If congestion charge is made permanent:
  - Simple zone structure seems to work OK
  - Charge levels and time periods can be fine-tuned
  - Continue simplification of payment and administration
  - Consider seasonal traffic variation
  - Charge on Essingeleden?
    - Well: has not become significantly worse than before – so far.
What surprised us?

- ... that the simple charging structure worked so well
- ... that the effects happened and stabilised so quickly
- ... that the congestion reduction could be seen by virtually everybody
- ... the change in attitudes
- ... the many ways to adapt to the charges
International attention

- US’ new transport strategy mentions Stockholm as a good example

  “The demonstrated success of road pricing.
  Other major cities around the world, including London, England and Stockholm, Sweden most recently, have reduced congestion and improved throughput almost immediately through the implementation of congestion pricing strategies.”