Effects of Charges
Comparison
Gothenburg - Stockholm

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Stockholm and Gothenburg

- 2 million people
- High public transport share
- Road congestion in over bridges
- Built on 14 islands

- 1-0.5 million inhabitants
- Lower public transport share/low density
- Less road congestion/freight hub
- River with only 3 – 4 crossings
Similarities:
- Time-of-day dependent cordon pricing

Differences:
- A multi-passage rule states
- Public transport share (density)
- Size and Congestion levels
- Location of congestion
- Topology 38/18 check points

Objectives/Drivers
- Public opinion

Stockholm and Gothenburg

<table>
<thead>
<tr>
<th>Time</th>
<th>Amount (SEK)</th>
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<tbody>
<tr>
<td>06:30-06:59</td>
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<td>18:30-06:29</td>
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</table>
• What can we learn about transferability of the effects, acceptability and adaptation mechanisms?
Objectives of the Gothenburg Charges

- 1 million € net revenue in 2015.
  - 30% more than the Stockholm revenues (Gothenburg being less than half the size).
- Congestion reduction (required by the law)
- Reduction in air polluting emissions from traffic

Objectives of the Stockholm

- Congestion reduction
- Reduction in air polluting emissions from traffic
- Revenue ???
Smaller reduction across the cordon (12% / 22%)  
Slower adjustment than in Stockholm
Small visible effects on departure time choice

- Very similar in Stockholm:
  - The spikes disappeared after a while
  - Equal effect in the mid-day as and peak - in spite of higher charge
  - Virtually no effect outside charged hours
Some route choice effects
Effects compared to model forecast

- Model predicts the same effect across the day
  - As in Stockholm
- More discretionary in off peak – apply more adaptation mechanisms that are not captured in the forecast model

<table>
<thead>
<tr>
<th>Oktober 2012 - Oktober 2013</th>
<th>Mätningar</th>
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<tr>
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<tr>
<td>EM</td>
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<tr>
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<tr>
<td>Betaltid</td>
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<tr>
<td>Icke betaltid</td>
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</table>
Adaptation: similar in Stockholm & Gothenburg

Trips

- Professional traffic - "disappeared"
- Discretionary - "disappeared"
- Work - transit
- Work - remaining
- Discretionary - remaining
- Professional traffic - remaining
A general over-prediction of the effect

- The underprediction of the off-peak effect is cancelled out by a general overprediction of the total effect.
- 18% compared to the observed 13% in the peak.
  - Underpredicted the use of the multi-passage rule (30%-45%)
  - Overprediction of the route choice effects
    - The topology makes route choice more difficult to model.
    - The VD functions predicts no reduction in travel time
Better air quality in the city centre?

- Reduction: 9%
- Ca 3-5% due to congestion charge
- Rest bus lanes/parking measures?
- 1/3 of the effect across the cordon similar to Stockholm

<table>
<thead>
<tr>
<th></th>
<th>Betaltid</th>
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Increasing traffic flow – detours

- But there is (mostly) capacity
- Increases smaller than predicted.

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Increasing traffic flow – detours

• But there is (mostly) capacity
• Increases smaller than predicted.
Travel times

- Congestion on the innermost links is significantly reduced (average travel time 2-5 min).
- Small effects on other links
Public transit use

- Traffic counts from Västtrafik unreliable (optional to tap the travel card)
- Ticket sales:
  - The monthly and yearly ticket sales increased by 7.5%
  - 2% (1-3%) yearly increase for many years
- 6% in charged relations, according to travel survey
- 4.5-6.5% (model prediction: 3%, excluding the extension of the PT improvement).
Opinions

Stockholm

Göteborg

- Spring 2011
- Spring 2012
- Autumn 2012
- Spring 2013
- Winter 2014
- Spring 2014
- Autumn 2014
Why?

- More people pay a larger amount
- Lower PT share
- Large cost per inhabitant
- Smaller congestion reduction ??
- Unpopular barriers effects through residential areas
- More focus in the purpose of collecting revenue
Stockholm paved the way

- Introduced as a trial January-July 2006 - extremely controversial but forced on by the green party.
- Referendum September 2006 – majority *in favour* of charges!
- Agreed that revenues would co-fund the Stockholm bypass.
- Paradigm shift in Swedish infrastructure financing.
- Inspiration for Gothenburg politicians: Västsvenska Paketet.
- 50 % national funds and 50% regional funds (revenues).
- Agreement in 2009, preceded by virtually no public debate.
- All traditional political parties in Gothenburg in favour.
- Referendum September 2014 – majority *against* the charges!
Summary – Differences and Similarities

- Gothenburg smaller and less dense
- Has more potential “Rat-running” and detouring
- Larger charge per inhabitant
- Less and more local congestion
- Funding a more important driver
- Opinion more negative in Gothenburg

- Revenue of the same magnitude (1 MSEK/Year)
- A substantial/persistent reduction across the cordon
- Small/absent effects outside charging period
- Same adaptation mechanisms
- Reduction in the inner city approx. 1/3 of the effect across the cordon.