Congestion Pricing in Stockholm

Joel Franklin
Assoc. Professor of Transport Analysis
KTH Royal Institute of Technology, Stockholm
A Story Told Three Ways

1. Implementation
2. Acceptance
3. Environment
1. The Implementation
*Or, what is the congestion charge?*
Congestion Charging Trial
January – June 2006
Charge Levels

Charge, in SEK

Time of Day

€3.80

€2.20
Effects on Traffic Volumes, 2005 vs. 2006
Effects on Travel Times, 2005 vs. 2006

Fig. 4. Relative increase of travel times for various categories of links. 0% corresponds to free-flow travel time. The coloured bars show average travel times while the “error bars” indicate the worst decile and the best decile of the travel times distribution. Measurements were taken from all weekdays for 6 weeks in April–May. “AM peak” refers to 7.30–9.00, “PM peak” refers to 16.00–18.00.
Effects on Travel Behavior, 2004 vs. 2006

a) Auto

-54 (-68%)
-22 (-19%)
-21 (-19%)
+3 (+5%)

b) Transit

+10 (+16%)
+11 (+5%)
+9 (+4%)

2. The Popular/Political History
Swinging Support
Opinion Polling

Eliasson, 2008
Why did voters accept it?

Variability of Personal Experience
Why did voters accept it?

Collectively-Perceived Effects vs. Personal Experience
Why did voters accept it?

Network Effects
Why did voters accept it?

Long-Term Re-Sorting
3. The Environmental History
Did congestion pricing matter?
Direct Effects of Congestion Pricing

City of Stockholm (2006)
Stockholm’s Mix of “Green” Transport Policies

2005:
• Free Residential Parking in Central Stockholm for LEVs

2006:
• Congestion Charging Trial
• Low-Emission Vehicle (LEV) Exemption Starts

2007:
• Started National Purchase Rebate
• Congestion Charges Return, Permanently (with LEV exemption)

2008:
• LEVs are 28% of new vehicle purchases

2009:
• Stopped LEV Exemption for New LEVs
• Stopped Free Residential Parking for LEVs
• Stopped National Purchase Rebate

2012:
• Stopped LEV Exemption for Old LEVs
Competing Forces

- Vehicle Choice
- User costs per km (-)
- Emissions per km (-)
- Travel Choices
- Total km (+)
- Total Emissions
Sweden’s Central Bureau of Statistics’ (SCB) vehicle registry data for Stockholm County, 2008

### Vehicles
- Make
- Model
- Year
- Propulsion
- Fuel Consumption
- Emissions

### Owners
- Age
- Gender
- Income
- Home Post Code
- Work Post Code
- No. Children

### Travel
- Annual Kilometers Traveled (AKT)
Key Findings

• LEV owners travelled further than Conventional Vehicle owners of similar characteristics (between 1.6 and 11.2%)
• Some difference is associated with the LEV exemption:
  – Large for inner-city residents: +10.4%
  – Not so much for suburban residents: +0.9%
• Difference is due to non-work trips?
Simulated effects on emissions:

- Reduction due to vehicle technology: \(-49.5\%\)
- Increase due to rebound effects: \(+2.5\%pt\)
Outlook for Research

Vehicle Choice

Travel Choices

Base Emissions Per km

Total km

Total Emissions

User costs

Travel Demand

Congestion

Speeds
Summary

• Had exactly the intended effect on traffic
• Unexpectedly strong acceptance after the fact
• Weak effects on the environment for the region
• Exemptions for Clean Vehicles may bring about long-term effects, but only if in place for longer

Thank you!

Joel Franklin
joelfr@kth.se