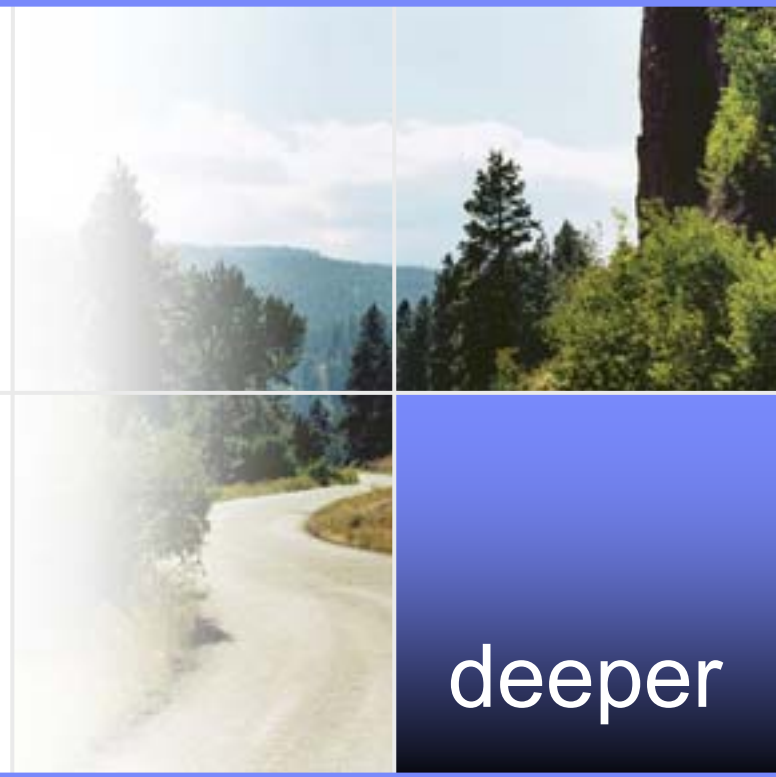
TRB Third International Conference on
Performance Measurement



Stockholm Congestion Charging Program:
A Performance View

Naveen Lamba
naveen.lamba@us.ibm.com

deeper

Outline

- A Brief History
- Trial Program Objectives and Overview
- Trial Program Performance
- After the Trial
- Discussion

The Stockholm Trial Project - History & Future

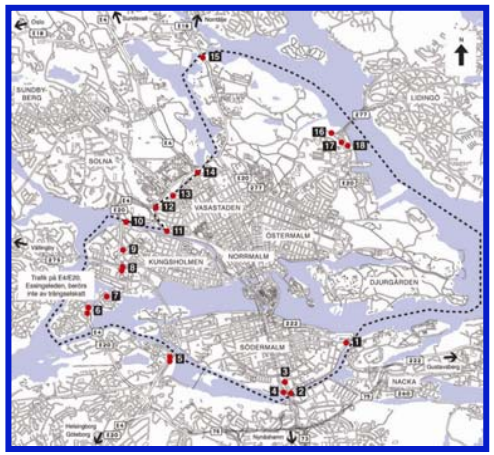
- General election September 2002
  - Social Democrat Government announced the “Stockholm Trial Project”
- The Stockholm Trial Project
  - Procurement of the “technical system” started August 2003
  - Contract signed July 2004
  - Congestion tax trial period 3 January 2006 – 31 July 2006
- Referendum and general election September 2006
  - New conservative government announced the new policy of Congestion Charges
  - The congestion Charges started as a permanent on 1st August 2007

The Stockholm Project: Built on Three Complementary Components

Improved Public Transportation

New Park & Ride

Congestion Charges



The city of Stockholm	**Procurement, General information, Evaluation program, Park-and-ride**
Swedish Road Administration	**Congestion Charges system owner, information how to pay tax**
IBM	**Technical system design & built, system operator**
SL	**Public Transport operator**

Stockholm Road Charging Scheme: Overview

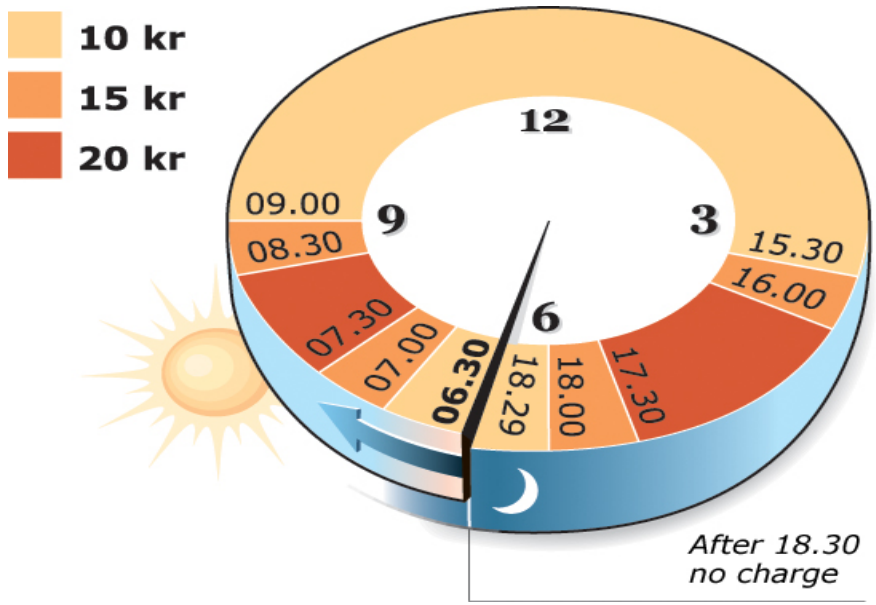
- Congestion Charges trial period
  - Trial period January 2006 - July 2006
  - Referendum September 2006
  - Decision about making the system permanent or not

- Objectives – Improved mobility and environment
  - Reduce congestion (reduce traffic volume by 10 -15 % during rush hour)
  - To improve accessibility for buses and cars in the inner city.
  - Improve the environment

- The congestion charge is a national tax
  - The revenue will be returned to the Stockholm region for investments in the public transport system and infrastructure connected with the trial

Pricing approach for redistributing the traffic volume over time

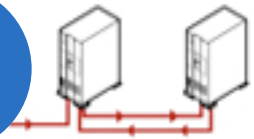
- Charge in both directions across the cordon
- Peak – “low price” structure
- Maximum charge per day 60 kr (9 Dollars)
- No charge during
  - Evenings, Saturdays, Sundays, holidays
- Exempted traffic
  - To and from the Lidingö island (8%)
  - Taxis (8%)
  - Environmental vehicles (3%)
  - Buses over 14 tons (2%)
  - Vehicles with disability permits (2%)
  - Foreign cars (1%)
  - Emergency vehicles (0%)
  - Motorcycles



How Does the Stockholm System Work?

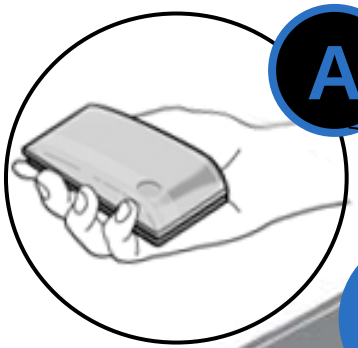
Call-center operations managed by IBM

2



Information is matched with registered vehicle. Vehicle owner has five days to pay

The gateway registers the vehicle



1

B

Picture is taken of the vehicle's license plate.

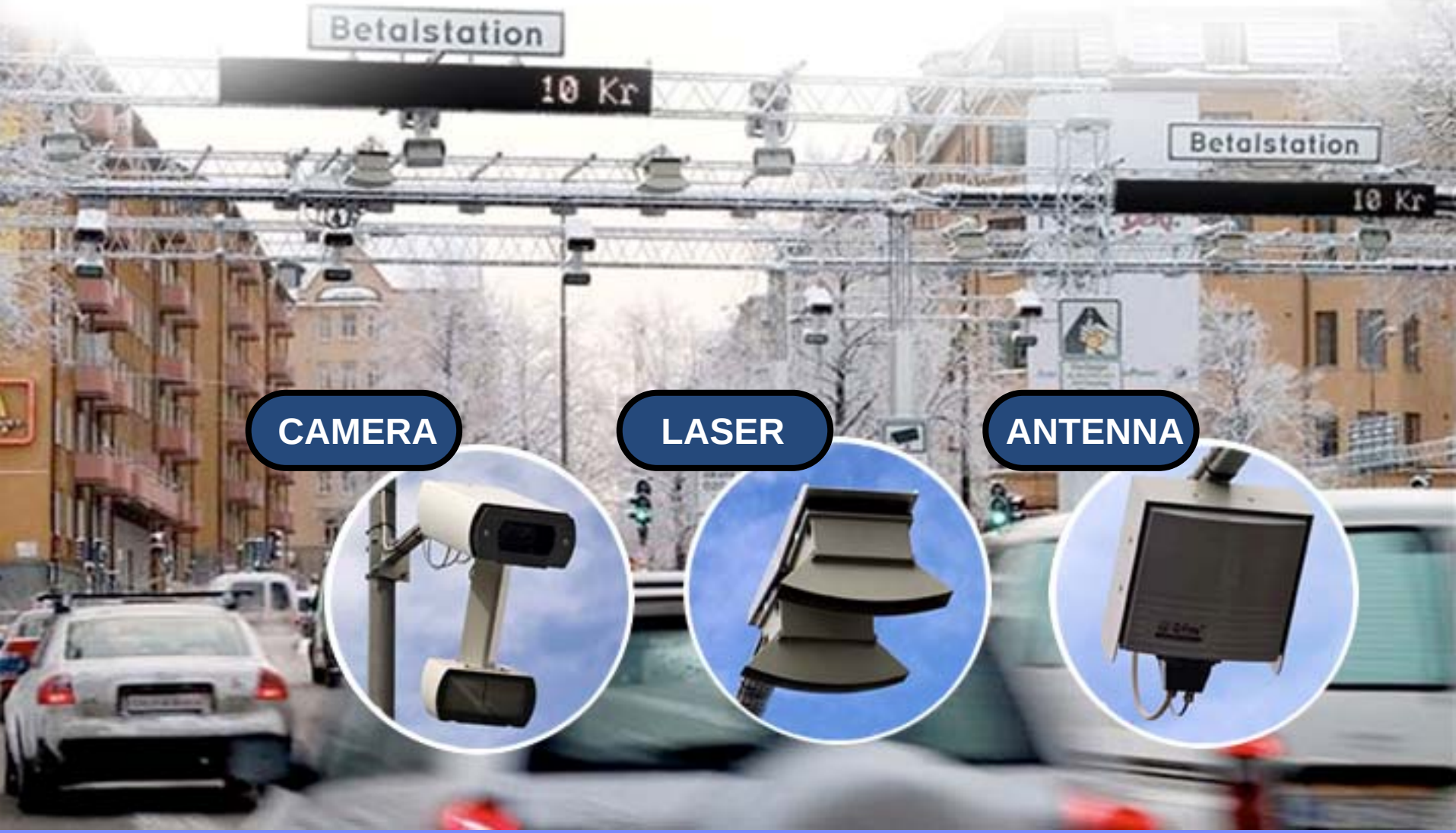
ABC 123

IBM has designed, built, implemented, integrated and runs the congestion charging system

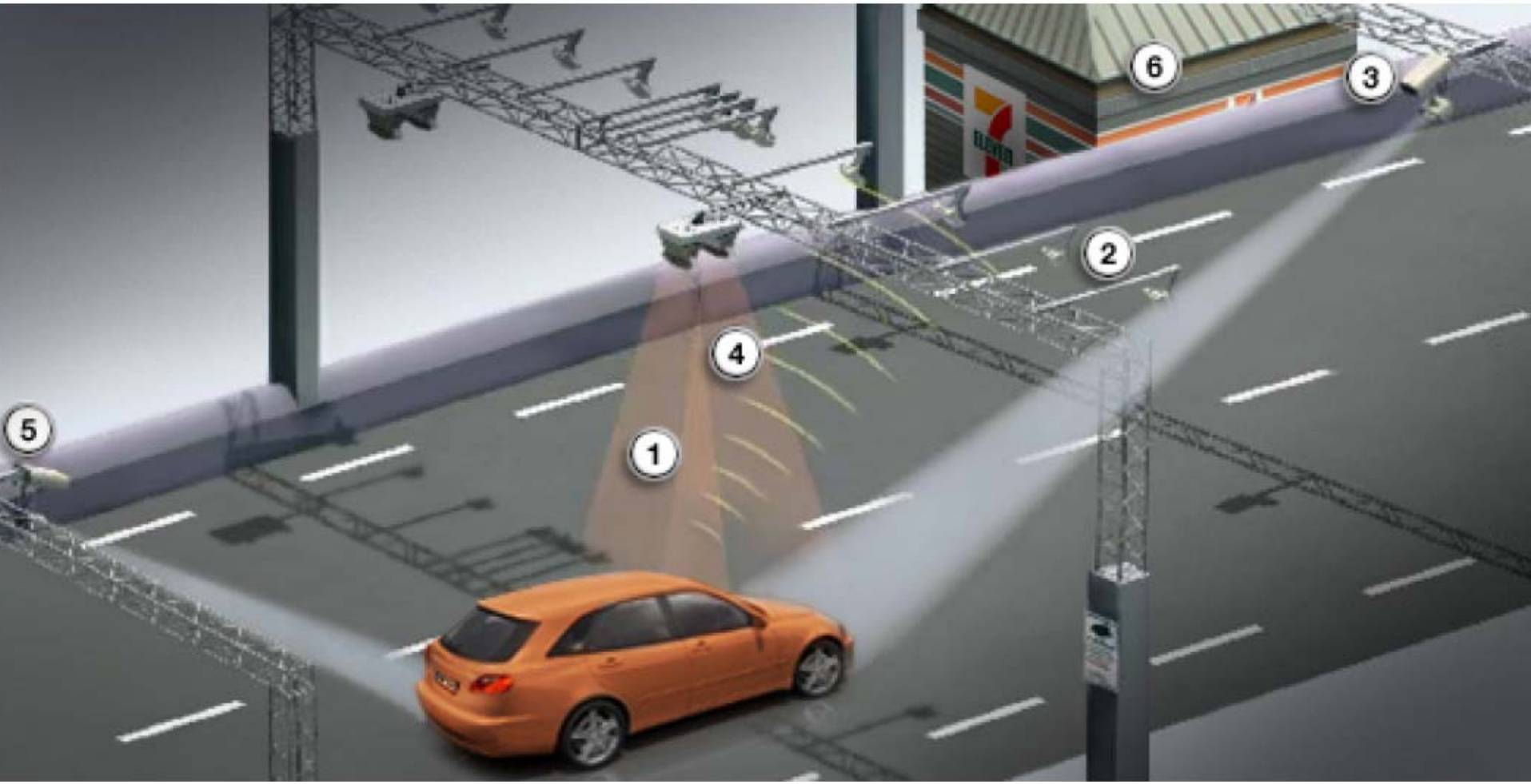
3

Way of payment
- Transponder/direct debit
- License Plate/direct debit
- Internet
- Contact Center
- 7-eleven/ Pressbyrån

No barriers, no stops, no roadside payments



The Roadside Technology: A Closer Look



A Few Performance Metrics

Volumes per day

- 350,000 passages to identify
- 850,000 photos to manage
- 110,000 payments to manage
- 10,000 - 2,000 calls per day

Scale

- 1,000,000 user accounts
- 430,000 distributed transponder
- 81 charged lanes
- 7,4 Terabyte storage

Performance

- 99,96 % system availability
- Very low number of failed charges

Enforcement

Key numbers for reviews and appeals (7 months of operation)

Passages at control points	46 500 000	
Passages liable for the tax	33 500 000	
Number of tax decisions	14 400 000	**100%**
Appeals to the tax Authorities	13 000	0,09%
Granted (up to June 16)	5 200	***100%***

of which:

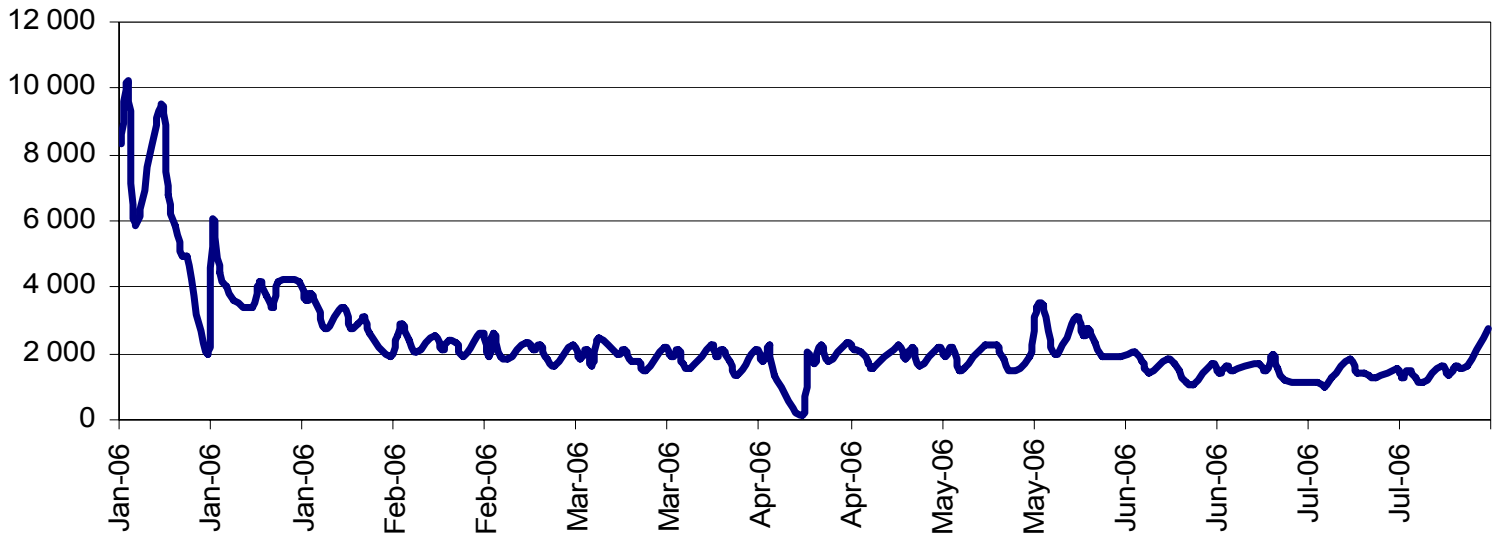
▪ Incorrect number plate interpretation	1040	*20%*
▪ Lidingö rule exemptions	468	*9%*
▪ Stolen number plate	416	*8%*
▪ Manipulated number plate	156	*3%*
▪ Foreign registered vehicle	104	*2%*
▪ Stolen vehicle	52	*1%*
▪ Other	2 964	*57%*

Appeals to the County Administrative Court	665	0,005%

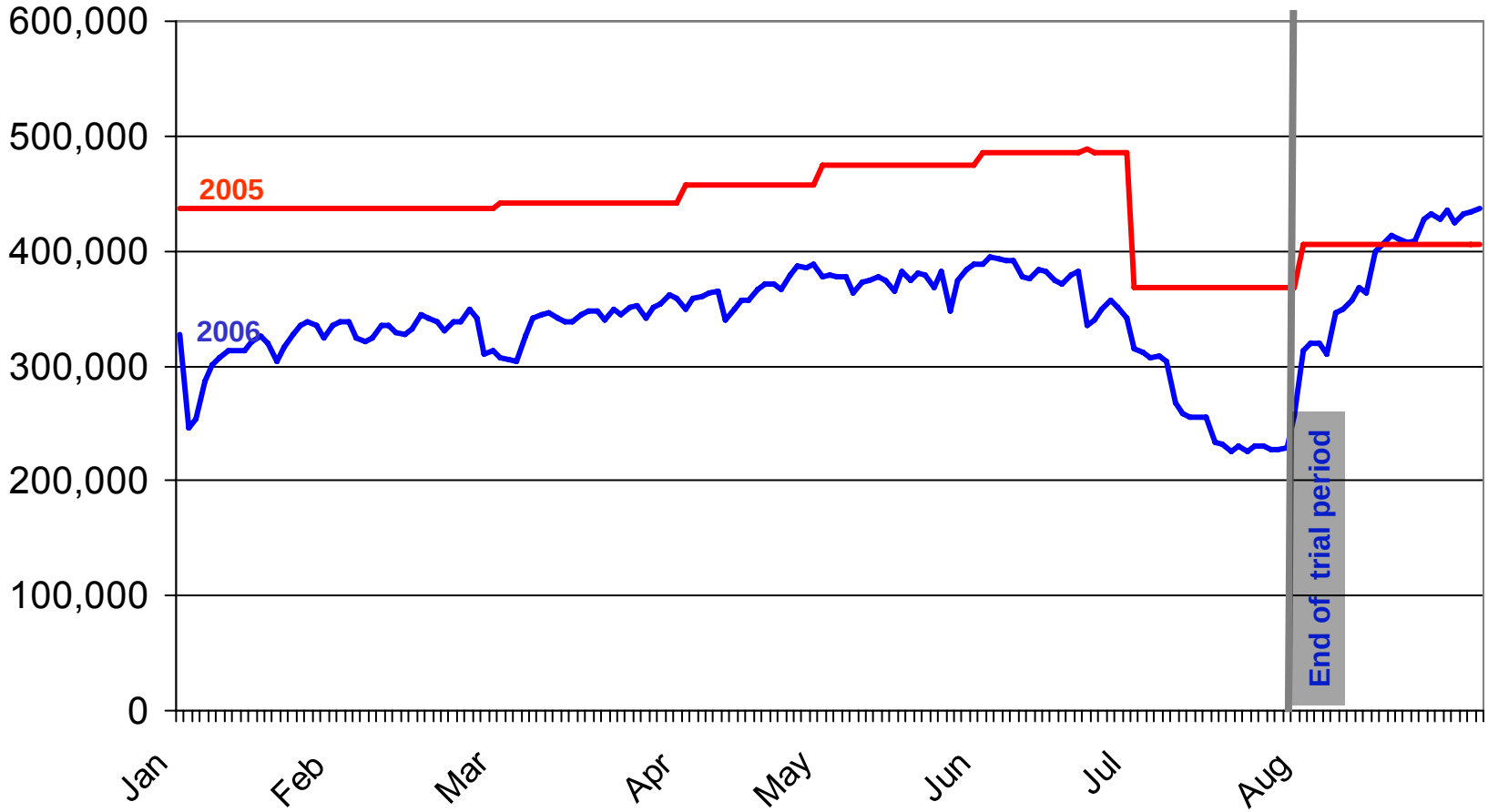
Integrated and Efficient Customer Services - Call Center Volumes

Most common questions:

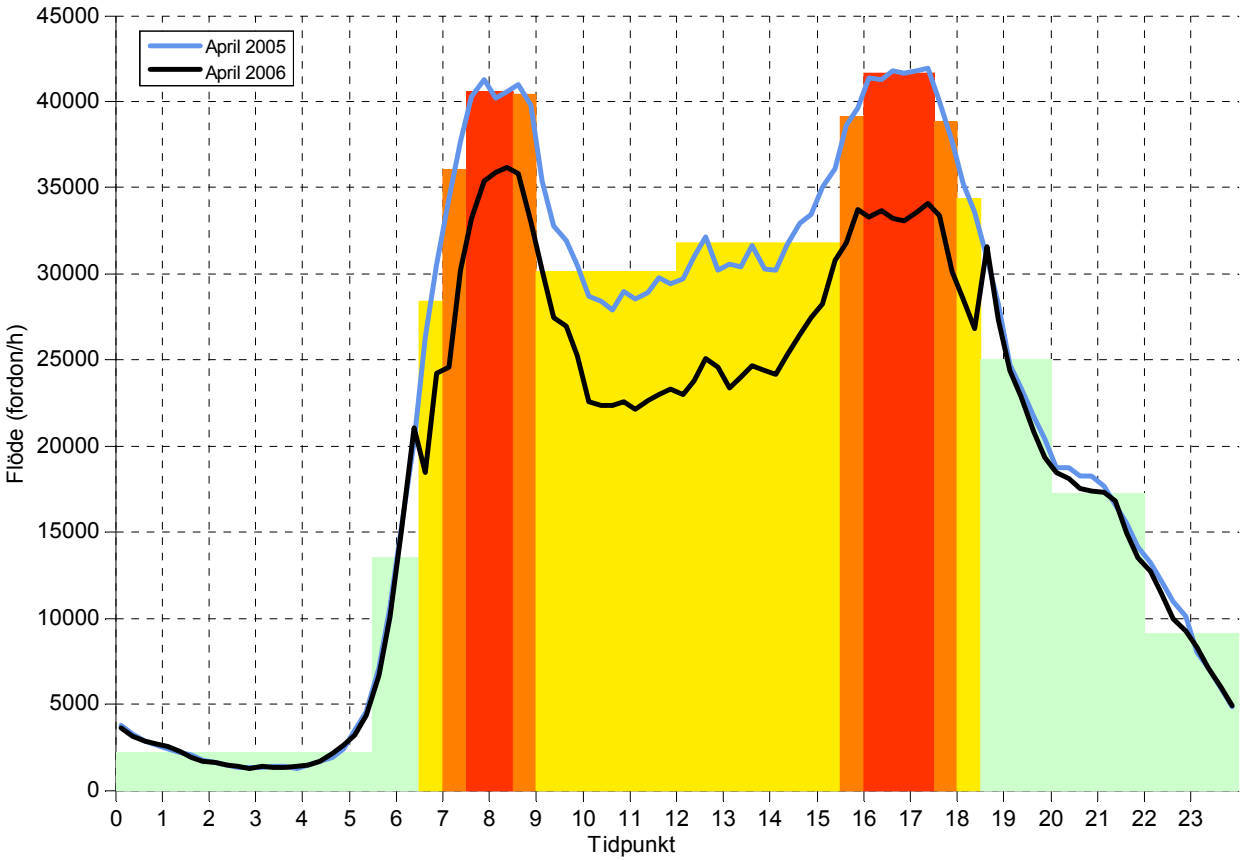
- Payments and accounting
- Onboard units
- Company enquiries
- General information
- Balance statement



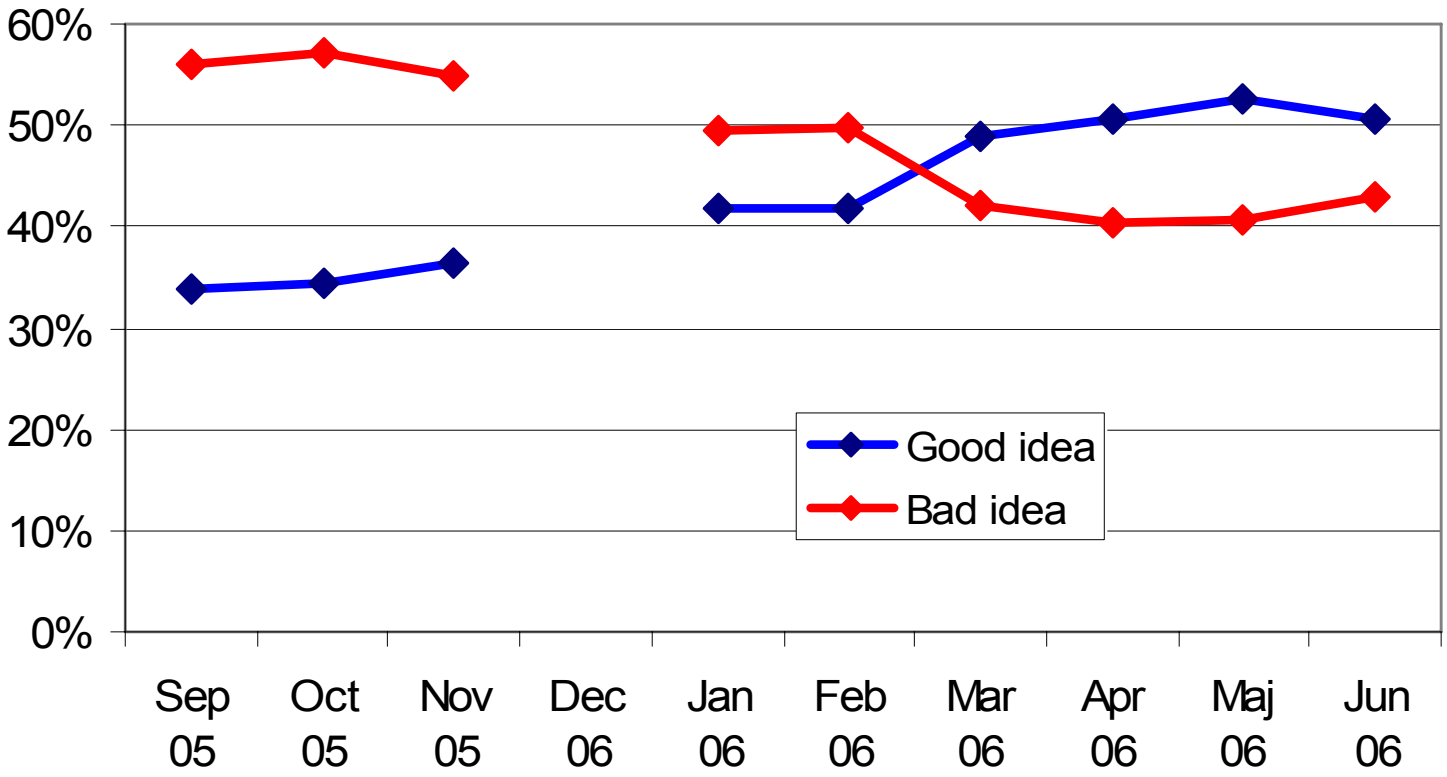
Number of passages reduced by 90 000 to 115 000 per day (20 – 25%) compared to the year before



Traffic Impact: Peak traffic was reduced



Public Opinion: The swing in the opinion came after 3 months



Referendum in the City och Stockholm

YES: 51,7%

NO: 45,6%

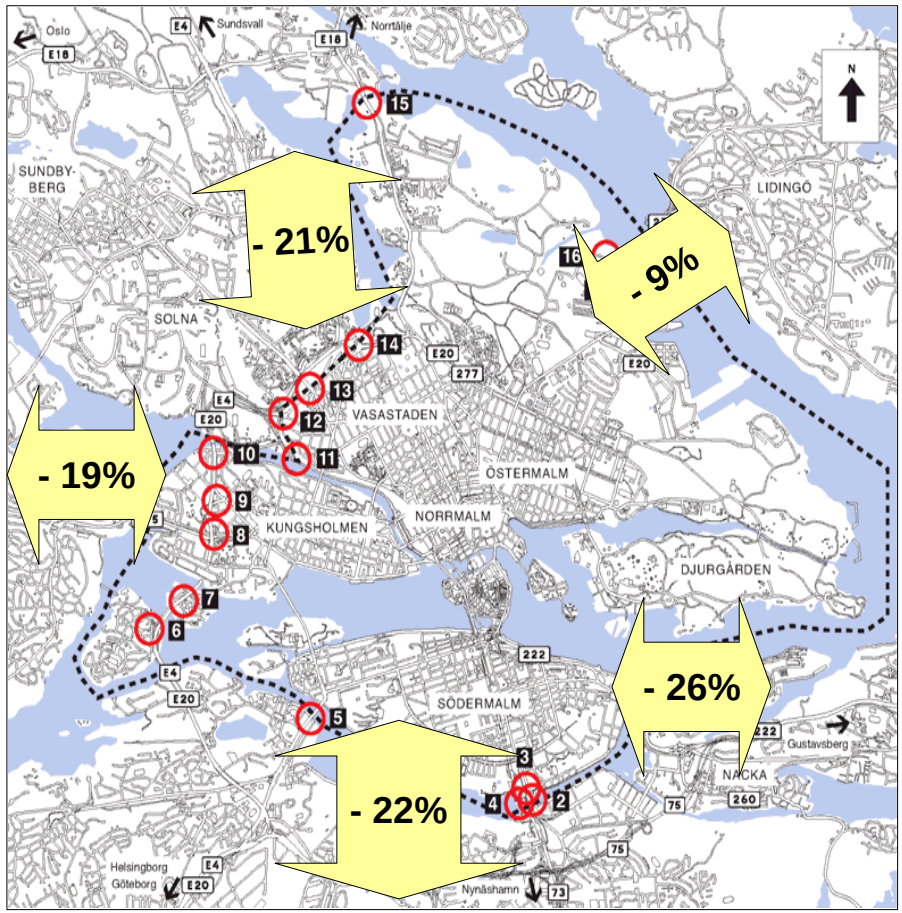
Stockholm Congestion Charging System – A Huge Success

The Outcome – Exceeded all Expectations

- 25% reduction in traffic volume, removing 100,000 peak hour vehicles. Stable and sustained
- Increase of 40,000 mass transit users per day. Bus schedules speeded up
- 30 – 50% reduction in queue times
- Decreased Emissions – 14% in city, 2.5% in county
- Public Opinion – increasingly positive, media, individuals and businesses

Challenges

- Short delivery time of a complex solution in combination with a fixed launch date under significant public scrutiny
- Integration of a large number of external partners



Technical System Availability – 99.96%

Worked well in complex and simple locations, in good weather and bad

- All service level agreements met from day one till the end of the trial period
- Error rate below 0.1% of all charges

Stockholm Congestion Scheme – After the Trial

- Congestion charging scheme trial period ended July 31st 2006
- Traffic volumes up by an average of 20% on August 1st
- A “non-binding” public referendum was held on September 17th
  - Mixed vote - City resident voted “Yes” to continue the scheme, other neighboring jurisdictions voted “No”. Overall, split was almost 50-50
  - The new government has decided to make the scheme permanent, with some policy changes that allow for using toll revenue for a broader set of transportation infrastructure improvements
- The permanent system went live on August 1st, 2007 as a camera-based tolling system – no transponders
- Significant interest from around the world in the scheme design, implementation and operation
  - Onsite visits from several U.S. organizations, both public and private
    - San Francisco
    - New York
    - Seattle
    - Minnesota

Representative Performance Metrics

Daily Passages	345,000
Percentage of license plates sent to MCR	4.6%
Number of calls to customer service	2200
Percent of calls answered within 60s	> 99.5%
System Uptime (lane-minutes)	> 99.99%

धन्यवाद
Hindi

多謝
Traditional Chinese

ขอบคุณ
Thai

Спасибо
Russian

Gracias
Spanish

Thank You

شكراً
Arabic

Obrigado
Brazilian Portuguese

Danke
German

Grazie
Italian

多谢
Simplified Chinese

Merci
French

תודה
Hebrew

நன்றி
Tamil

감사합니다
Korean

ありがとうございました
Japanese