Business Consulting Services

Stockholm Congestion Charging System

Background
Procurement
Solution
IBM top ten advice

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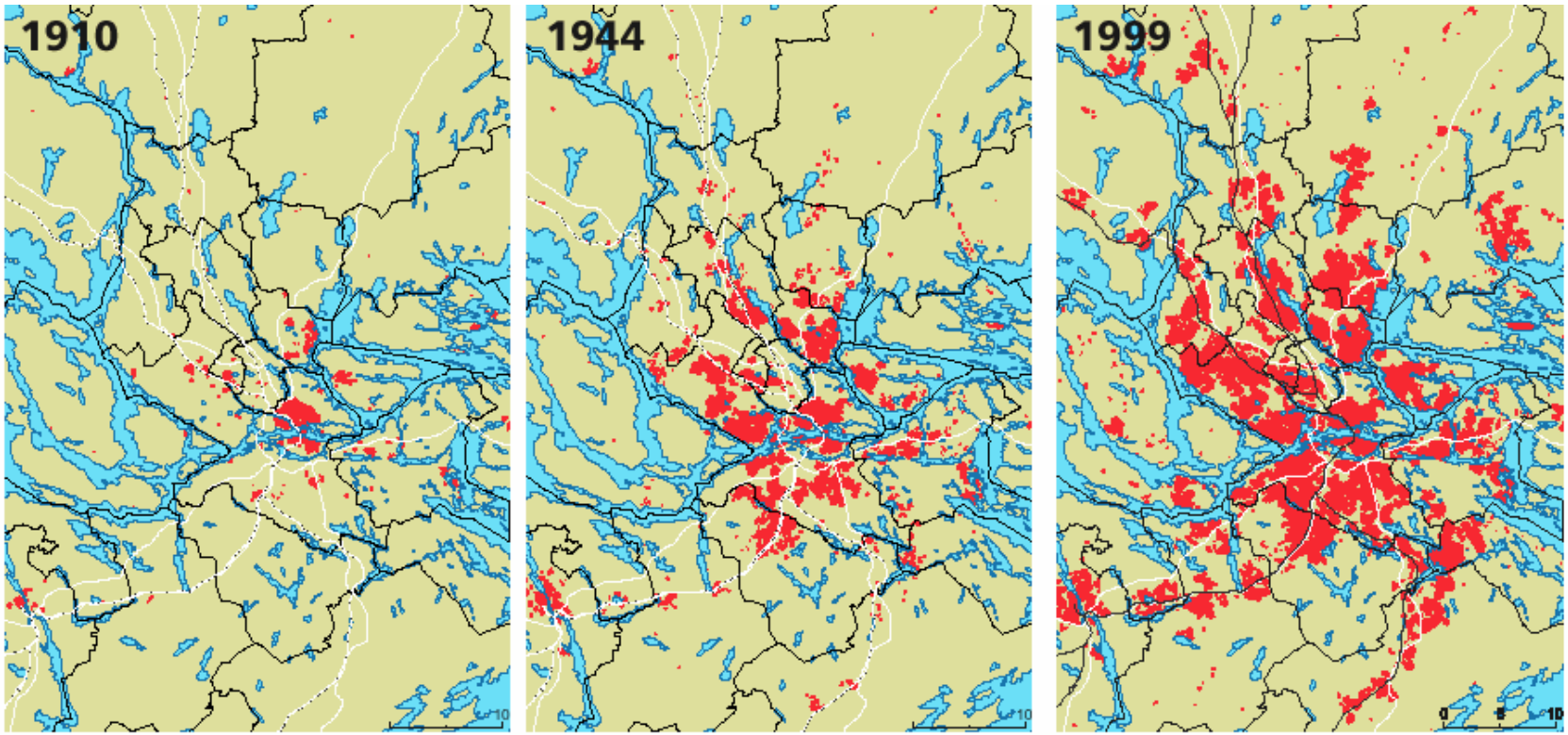
Background

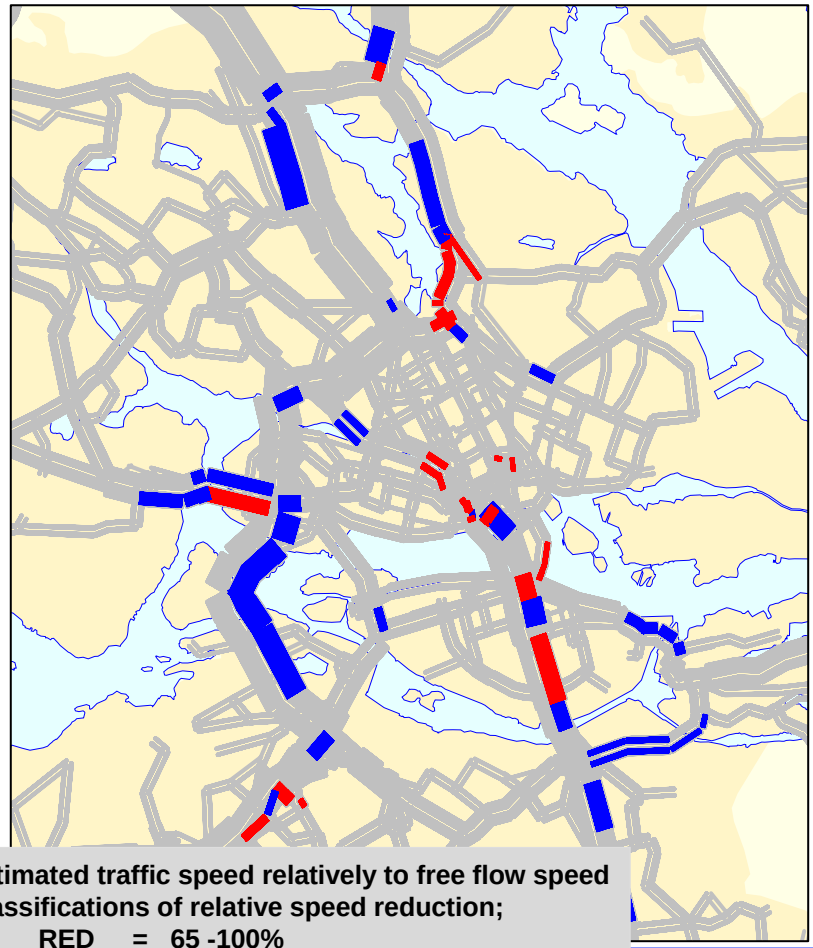
The history of Stockholm Development
Bottlenecks in the Stockholm road network
Facts about Stockholm
The political objectives and design
Charging structure

The history of Stockholm Urbanization

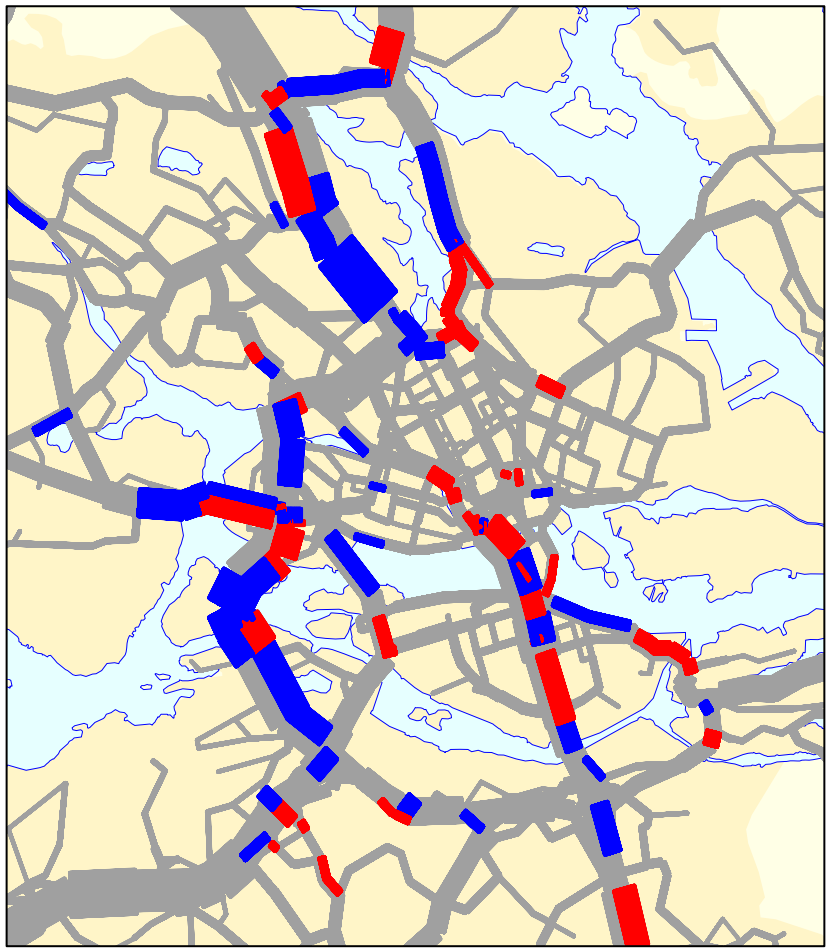


Bottlenecks in the Stockholm road network will increase due to, increased number of inhabitants, income and car ownership. The bottlenecks cause low efficiency and accessibility and security problems.

1998 "Present situation"



2010 Forecast base scenario



Estimated traffic speed relatively to free flow speed
Classifications of relative speed reduction;

RED	**=**	**65 -100%**
BLUE	**=**	**50 - 65 %**
GREY	**=**	**0 - 50%**

Facts about Stockholm

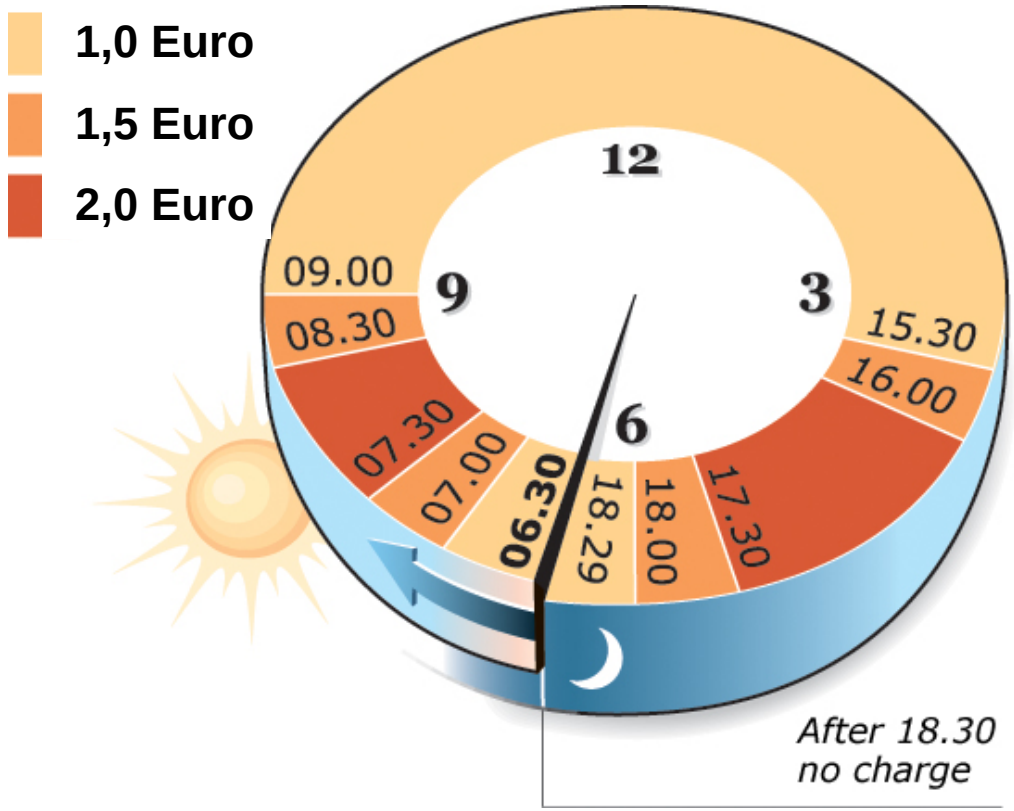
- Inhabitants
  - **1,9 million in the county of Stockholm**
  - **760 000 in the city of Stockholm**
  - **275 000 in the Stockholm inner city**
- Travel & transportation
  - **560 000 vehicles cross the inner city cordon per working day**
  - **70% of all personal trips across the inner city cordon during rush hour is by public transport**
  - **2,5% car ownership increase per year**
- External impacts
  - **Road safety**
    - **361 severely injured**
    - **18 traffic deaths**
  - **10-100 cases of cancer caused by atmospheric pollution**
  - **50 000 inhabitants exposed to over 65 dBA**

The political objectives and Road User Charge system design

- Congestion Charges trial period
  - **Trial period August 2005 - July 2006**
  - **Referendum September 2006**
  - **Decision to make the system permanent or not**
- Objectives
  - **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.**

Peak - Low pricing approach for redistributing the traffic volume over time

- Charge in both directions across the cordon
- Peak – low price structure
- Maximum charge per day 7 Euro
- No charge during
  - **Evenings, Saturdays, Sundays, holidays**
- Exemptions
  - **Emergency vehicles**
  - **Vehicles with disability permits**
  - **Foreign cars**
  - **Buses over 14 tons**
  - **Taxis**
  - **Motorcycles**
  - **Environmental vehicles (e.g. electricity, ethanol and biogas).**



Procurement

The Scope and proposal evaluation criteria
The procurement process and overall time schedule
Customer needs and IBM response

The Scope and proposal evaluation criteria

Scope:

- **Procurement based on functionality requirements**
- **Total responsibility for the establishment of the system and operations needed for road charging and the operations of systems and processes**

D&B

1. **Deliver a technical system with all the necessary equipment to handle the capture and administration of road charges**
2. **Design of the road charging system and related processes**

Operation

1) **Deliver all necessary services during test period (pilot) 2005-08-14 – 2006-12-31;**
2) **Extension until 2011 (year by year) - as an option**

Evaluation criteria

- Price (55%)

  The price based on the total cost for systems, products and services during the trial period.

- Functional solution (25%)
  - **Efficiency**
  - **Reliability and security**
  - **Use of the system seen from a user perspective**
  - **Method to coordinate and integrate the parts involved in the undertaking**
  -
- Time for start of operation (20%)

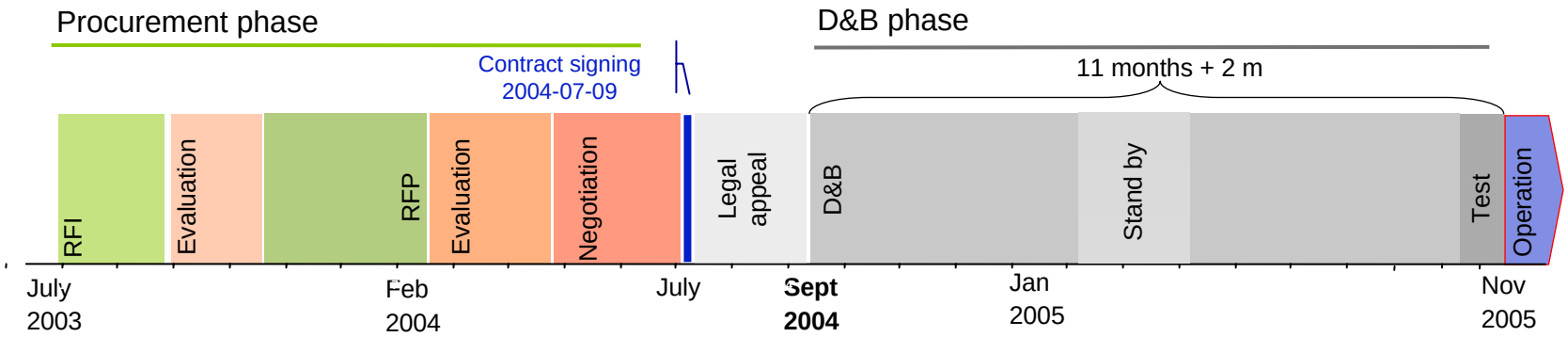
Overall time schedule – a complex procurement process

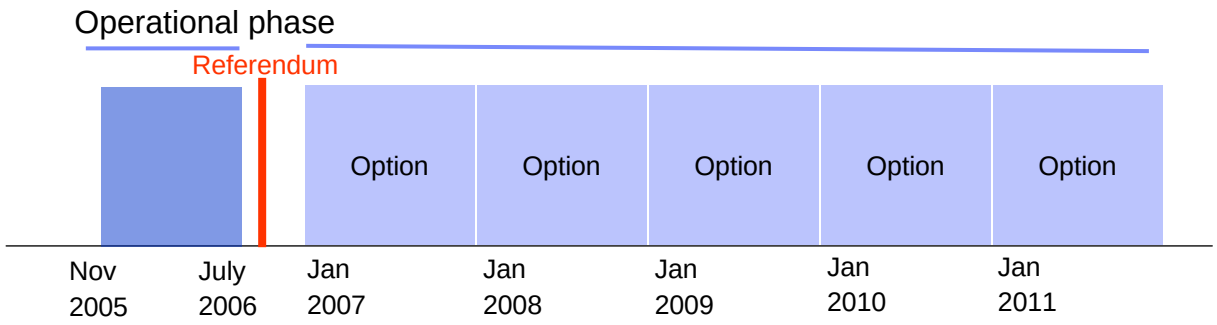
Competitors

- IBM Svenska AB (Q-Free)
- Consortium Combitech (Kapsch, Atos Origin, Transurban)
- Consortium SMAK (Q-Free, Siemens, WM-data)
- Logica CM Public Sector B.V. (Efkon)
- Consortium c/o TagMaster AB
- Consortium Appian Group

Law changes process

- Prime minister's keynote speech Jan 2002
- Decision municipal council June 2003
- Government decision about the Government law bill April 2004
- Parliament decision about the new law June 2004





Customer needs and IBM response

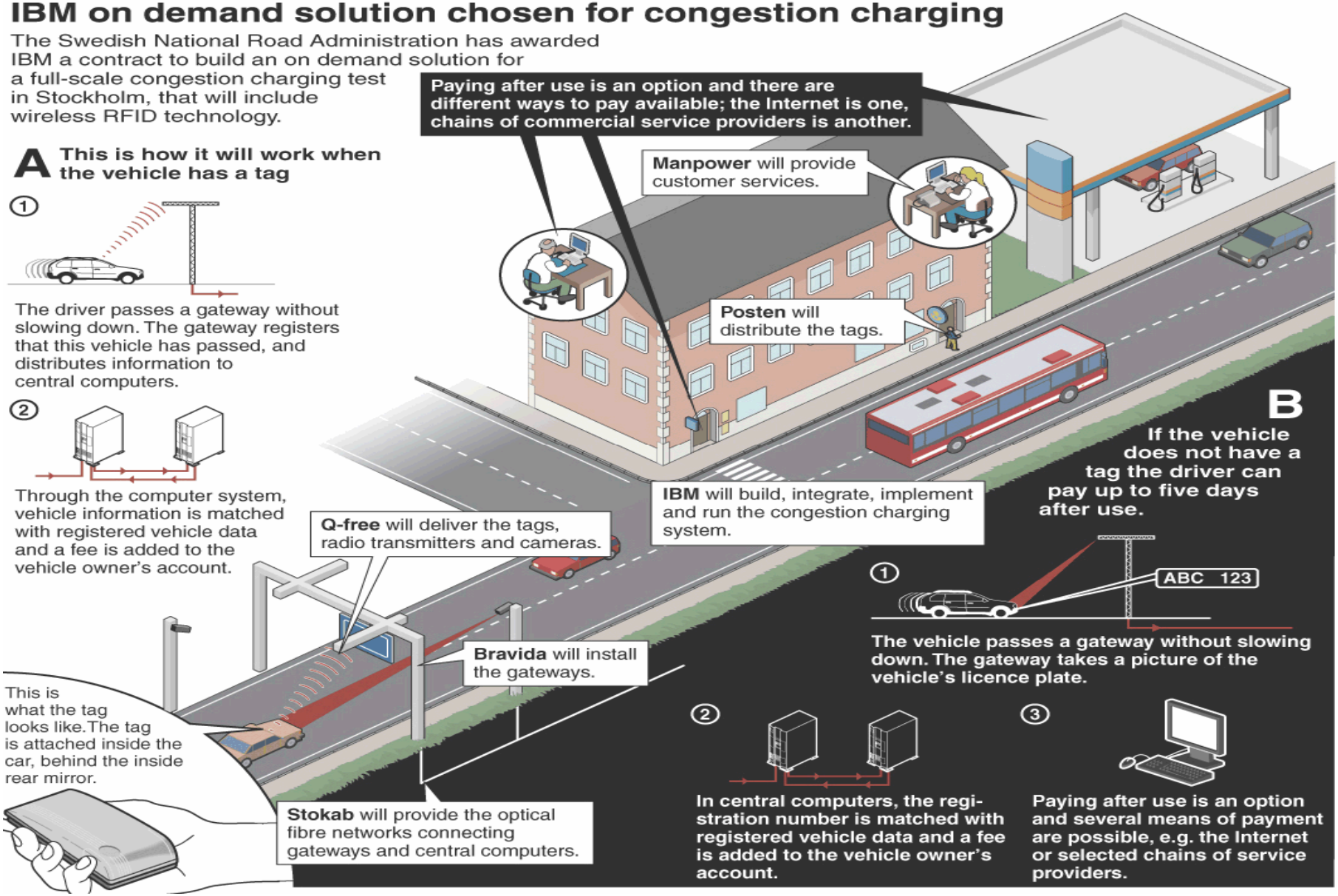
Client needs	IBM response
▪ **Secure and reliable system fulfilling the functional requirements**	▪ **Based on well proven components from trusted parties (Q-Free, SAP)** ▪ **Co-operating parties with road charging experience (Q-free, Rizit, Bravida)** ▪ **Best in class open and flexible architecture** ▪ **Starting macro design before signing**
▪ **Implementation aligned with political time schedule**	▪ **Time schedule of 11 months D&B compliant with needs if contract signed in June**
▪ **Deliver operations with required service and quality but show cost effectiveness**	▪ **Flexible and scalable staffing and organisation** ▪ **Co-operations with several “best of breed” (Swedish Post, Manpower, Statoil)** ▪ **On demand pricing in stable state**

Solution

High Level Conceptual Overview
Core processes and support functions
Flexibility and scalability – Road charging On Demand
Road side equipment

IBM on demand solution chosen for congestion charging

The Swedish National Road Administration has awarded IBM a contract to build an on demand solution for a full-scale congestion charging test in Stockholm, that will include wireless RFID technology.



Functional responsibility

Toll Stations	Fully automated, allowing for the free flow of traffic. Consist of sensors mounted on gantries or by the road
Customer Service Centre	Staff function to handle the majority of customer inquiries and requests.
Retail and Registration	Retail (or distribution) of the OBUs, capture of initial customer data and provider of operational services (recharging accounts etc..)
Data Transmission	Network segment, including RF, TCPIP and SMS
Payments	Logic and functionality to charge the correct amount to the correct account, based on usage and preferences.
Enforcement Centre	Image resolution, offender identification and payment enforcement, both manual and automated.
CRM Function	Automated and manual, payment reminders, special offers etc...
Web Servers	Web functionality to support different users web activities, including training and support functionality for all system users.
Administration & Maintenance	General support activities to ensure smooth running of the entire system

Process model

Activate & Distribute

Inform
- Marketing
- PR
- Call centre
- Internet

Register
- Internet
- Call centre

Distribute
- Posten

Purchasing and inventory management

Register Transactions

Register Passages
- Inform
- Detect and classify
- Capture data and photo
- OCR read

Pre-processor
- Transaction control
- Determine transaction liability
- Pricing
- Consolidate
- Cap tax
- Aggregate
- Reporting

Billing
- Format, customize
- Post

Charge

Management

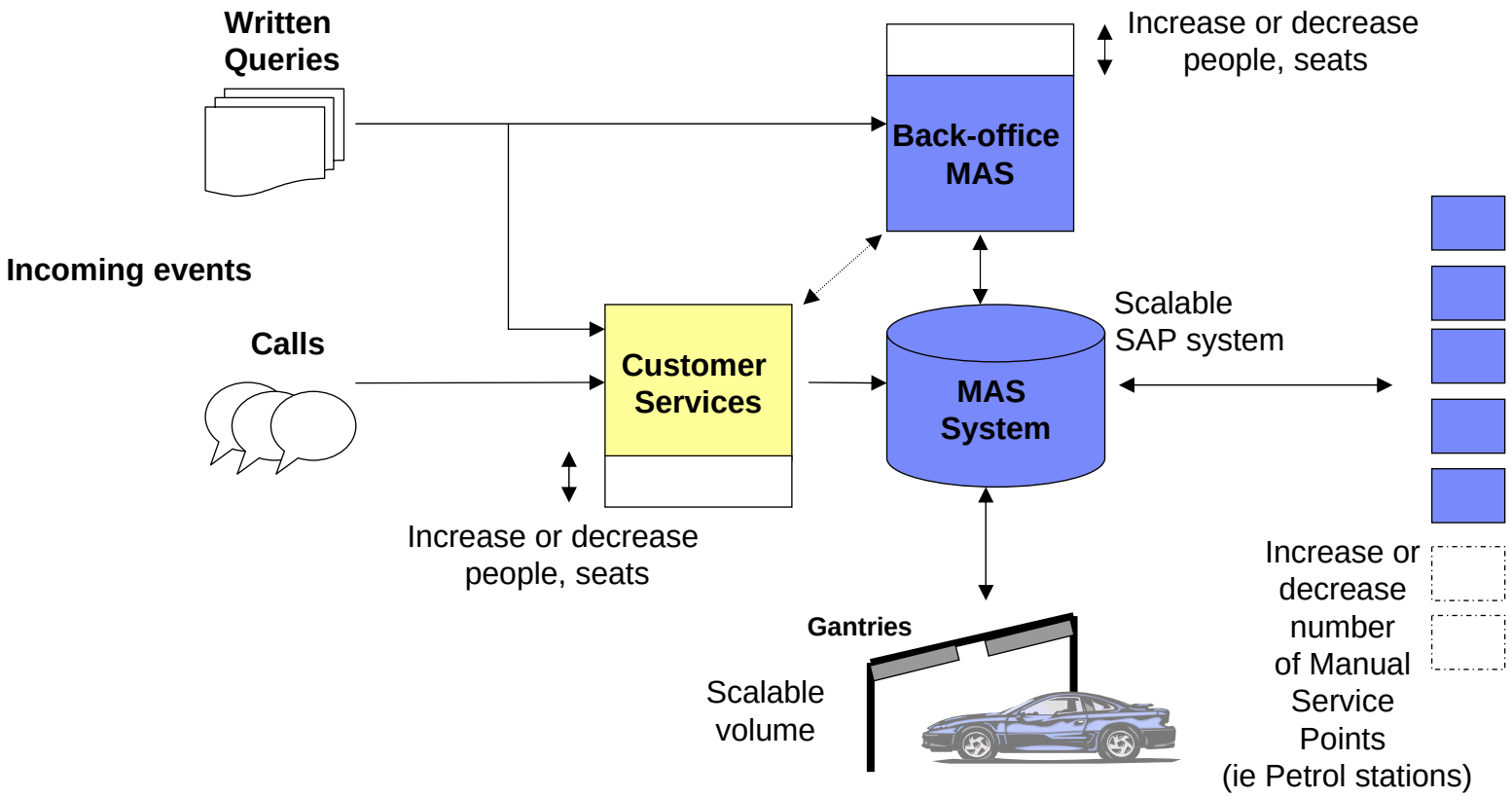
Payment
- **Internet**
- Bank transfer
- (Retail)

Dunning
- **Administrative fee**
- Supplemental fee
- Debt Collection

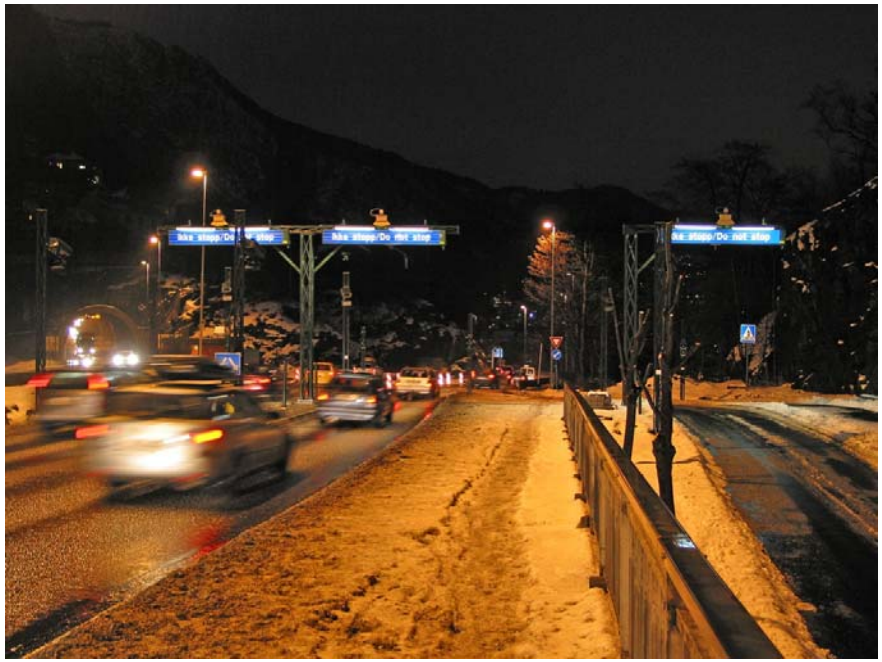
Accounting

Support processes

Flexibility and scalability – Road charging On Demand



Road side equipment
Free flow system, no payment at roadside



OBU, Readers, Cameras and Gantries

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IBM top ten advice

IBM top ten advice on procurement of Road User Charging system

Preparation phase

- Ensure strong political support & commitment
- Secure a clear objective for implementing Road User Charging
- Ensure Road User Charging is part of an Integrated Transport Policy and design the charging scheme and the distribution of revenue in order to support the objective
- Prepare regulations and legislation to support an efficient and user friendly system

Procurement phase

- Develop clear functional requirements
- Request a flexible and scalable solution based on open standard components
- Plan for the possibility of delays

Delivery phase

- Ensure strong project management within the client (buyer) organisation
- Deliver an early effective marketing / public information campaign
- Maximum payment channel choice for motorists key for success (adjust national legislation if necessary)