Smarter Transportation

Presentation to the CT Transportation Strategy Board

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“The world will continue to become smaller, flatter - and smarter. We are moving into the age of the globally integrated and intelligent economy, society and planet. The question is, what will we do with that?”

- Sam Palmisano
The need for progress is clear.

170 billion
Kilowatt-hours wasted each year by consumers due to insufficient power usage information.

4.2 billion lost hours
Annual impact of congested roadways in the U.S. alone.

2.9 billion gallons of gas

100 million
People worldwide pushed below the poverty line by personal healthcare expenditures.
For governments, this means leading in the face of global challenges brought on by key drivers.

**CHANGING DEMOGRAPHICS**  
Median ages are rising in the developed countries of Italy, Germany and Japan, but dropping in developing ones such as India.

**RISING ENVIRONMENTAL CONCERNS**  
Societies and governments are becoming more attuned to what the earth can provide and what it can tolerate.

**GROWING THREATS TO SOCIAL STABILITY AND ORDER**  
From terrorism to armed conflict to pandemics to natural disasters, the character of threats is changing.

**ACCELERATING GLOBALIZATION**  
Countries and societies are becoming more economically interdependent across social, political and cultural boundaries, as illustrated by current economic conditions.

**EVOLVING SOCIETAL RELATIONSHIPS**  
Today, governments are expected to deliver results and value through secure, private services that are available anywhere at any time.

**EXPANDING IMPACT OF TECHNOLOGY**  
The adoption of the Internet is remaking the landscapes of business, healthcare and government.

**Today’s imperative:** Managing within the current global financial and economic crisis in a way that begins to solve the above challenges and lay a foundation to build a better future.

Source: “Government 2020 and the perpetual collaboration mandate” IBM white paper
Smarter governments are working toward...

**CITIZEN-CENTERED EXPERIENCES**
Connecting people to programs based on individual needs—achieving sustainable outcomes while reducing operational costs and maximizing taxpayer value.

**GREEN GOVERNMENT FOR A GREENER PLANET**
Deploying environmentally responsible operations, from energy efficiency and conservation to transportation management and the pursuit of renewable resources.

**GOVERNMENT ACCOUNTABILITY**
Leveraging business intelligence and planning to improve insight and elevate performance with visibility and control.

**SENSE AND RESPOND CAPABILITIES**
Enabling defense and law enforcement organizations to achieve situational awareness, increased speed of command and combat superiority.
The opportunity for progress is clear.

**Utility networks:** Pacific Northwest National Laboratory

Consumers decreased their overall peak load on the grid by 15% when offered the opportunity to save an average of 10% on their electricity bills.

**Traffic system:** Stockholm, Sweden

The city cut traffic by 20%, lowered emissions by 12% and reported 40,000 additional daily users of public transportation.

**Smarter healthcare:** University of Pittsburgh Medical Center

This renowned academic medical center projects a $30 million reduction in capital and operating cost reductions over eight years, enabling it to meet an ambitious clinical agenda.

**15% reduction in peak loads**

**20% less traffic**

**$30 million in cost savings**
Innovation & Business Transformation Consulting

- Holistic analysis of ITS projects using IBM maturity model
- Focus on transport authority’s IT framework: use of open standards, SOA
- Enable common solution components e.g. CRM, payment systems, enforcement
- Framework for future solutions, e.g. parking management, Pay As You Drive insurance

Road User Charging and Tolling (RUC)
- Technology and services assets that scale across highway / city / national schemes
- Design, build and operate schemes
- On board units, detection and validation, software platform/rating engine, financial clearing house, Business Process Services

Integrated Fare Management (IFM)
- Transit payment system
- Cross-modal / inter-modal capability
- Universal/Integrated transportation accounts
- Extendable to other services, e.g. parking, retail, identification

Transport Info Management (TIM)
- End-user traveler advice e.g. internet, 511, PDAs etc
- Asset Management
- Emergency Management
- Network Analytics and Optimization
- Cross-modal / inter-modal information
Smarter Tolling
Road User Charging – Technology Enabled Policy Implementation

- **Flat Rate Linear Tolling on select road segments**
  - US, Spain, China, India, France, etc.

- **Variable Tolling, HOT Lane Networks**
  - LA Seattle Atlanta San Fran.

- **City Congestion Charging**
  - London #1

- **Congestion Charging**
  - Singapore ERP I, Stockholm

- **National Lorry Charging schemes**
  - Germany, Austria

- **National/State all roads, all vehicle schemes**
  - Netherlands, Oregon, MN

- **Usage Based Taxation GPS – based pricing**
  - Singapore ERP II USDoT Oregon, MN, NV, MA, +

- **Multi-modal Emissions based - Personal carbon trading**
  - Milan
Queensland Motorways, Ltd. is Australia’s Largest Toll Road & Bridge DBMO

Over 69 million vehicles now travel on their road network; in 2008/09, over 76 million vehicles are anticipated

Shared Services Tolling System that integrates multiple toll systems to run on a single system

Move from cash toll-booths to open road/free-flow tolling

Built on IBM’s Stockholm / London ITS Model
Stockholm Congestion Charging Program

Complex solution deployed in 13 months with a fixed launch date under significant public scrutiny

- Trial period Jan 2006 – July 2006
- Referendum September 2006
- Decision made to make scheme permanent
- Re-started August 2007

Volumes/Scale

- 81 charged lanes; 350,000 passages per day = 850,000 photos per day
- 1,000,000 user accounts = 110,000 payments per day
- 1,000 - 2,000 calls per day

Performance

- 99.96 % system availability
- Very low number of failed charges

Impacts

- Traffic reduced by 22%; 15% reduction in emissions
- 40,000 new daily public transport passengers
- Bus time tables redesigned for increased average speed
- Inner-city retailers trade up 6%
- Attitudes changed from negative to positive
Stockholm Video
London Congestion Charging Scheme

- A zone-based congestion charging system with operating hours of 7AM – 6:30PM. There is a charge to drive or to park on a public street in the charging zone.

- The charge is £8 if it is pre-paid or paid by midnight on the travel day or £10 if you pay by midnight the following day.
  - A fine of £100 is assessed if congestion charge is not paid by midnight the following day.

- Multi-channel payment options:
  - Online, retail outlets, mail, telephone, SMS text message from a mobile phone, internet kiosks

- The charge is enforced by a network of cameras. The cameras are not a charging mechanism, but primarily an enforcement mechanism.
Eindhoven Usage Based Pricing Proof of Concept

IBM and partners running a 6 month long Proof-of-Concept in support of Usage-Based Road Pricing schemes

- 20-50 cars outfitted with GPS-based On Board Units

- IBM solution processing all GPS-based data to determine usage-based tariff to be collected

Key elements of Proof-of-Concept
- Data Integrity & Privacy
- GPS-based technologies - interoperability with multiple GPS systems (SatNav, Specialized On Board Units, etc.)
- Back-office system scalability