Intelligent Transport Systems for Urban Areas - Brussels

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• London Context – Mayor’s Transport Strategy
• Congestion Charging in London
• London – Managing Road Network
Current travel patterns in London

Figure 11: Spatial pattern of travel across London, with mode shares

Key:
- Public transport
- Car
- Walking and cycling

Note: Percentages are the daily 2005–2008 average proportion of all trips made to, from, or within London. Figures include trips made by London and non-London residents and exclude freight.
Current travel demand in London

Figure 12: Daily average number of trips (millions) in Greater London, 2007

Mode share

- Cycling: 2%
- Walking: 24%
- Public transport: 32%
- Private motorised transport: 43%

Note: Estimates of the daily average number of trips in Greater London (including trips to, or from, London)

London Plan population forecasts

Source: GLA DMAG
Distribution of population growth by 2031

3 key aspects to MTS policies

- Better coordination and integration of planning
- Providing further transport capacity
- Managing demand for transport
Crossrail

Orbital connectivity: public transport integration

- Improve interchange opportunities to make orbital journeys by public transport easier
- Provide better information on existing orbital journeys
Better streets, walking and cycling

Proposals for ‘making walking count’

- Better streets
- Making it easier to plan journeys on foot
- Development of the Key Walking Route

Bringing about a revolution in cycling in London

- Working in partnership
- Raising awareness and ‘mainstreaming’ cycling
- Improving cycle infrastructure, cycle training and safety
- Superhighways and cycle hire

Forecast mode share

<table>
<thead>
<tr>
<th>Year</th>
<th>Mode</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Cycling</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>Walking</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Public transport</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Private motorised transport</td>
<td>43%</td>
</tr>
<tr>
<td>2031</td>
<td>Cycling</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Walking</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Public transport</td>
<td>34%</td>
</tr>
<tr>
<td></td>
<td>Private motorised transport</td>
<td>37%</td>
</tr>
</tbody>
</table>

Note: Do not add up to 100 due to rounding.
Congestion Charging in London

London’s transport problems
Westminster Bridge – End of 19th Century

Central London Congestion Charging Zone
Charge payment

- Daily, weekly, monthly or annual payment for individual vehicle registration number
- Flat charge of £8 per day (was £5 until July 2005) until midnight
- Monday – Friday, 7am – 6pm (was 6.30pm until February 2007)
- Pay Next Day introduced June 2006
- Increase planned to £10 per day (£9 for automatic accounts) in December 2010
Traffic impacts of Congestion Charging

Central zone

- 25% reduction in traffic (4 or more wheels) entering the zone – has remained constant
- 70,000 fewer vehicles per day
- Bus patronage up, bus services performing better
- Little change in trips to central area with 50-60% moving to public transport

Western extension

- 19% reduction in traffic entering extension
- 30,000 fewer vehicles per day
- Increase in bus passengers

* During charging hours (07.00-18.00)
In 2002, before Congestion Charging began, there was an average of **185,000** cars entering the charging zone every charging day.

In 2003, after charging was introduced, this fell to an average of **124,000** cars entering the charging zone every day.
Average daily traffic entering original charging zone* 

In 2008 an average of only **106,000 cars** entered the charging zone every day - a decrease in cars between 2002 and 2008 of some **43%**

Between 2002 and 2008 there has been a steady decline in traffic volumes, with little impact caused by the shift from £5 to £8 in 2005

Similarly there has been a **16%** fall in vans and **5%** fall in lorries entering central London since the introduction of Congestion Charging

* During charging hours (07.00-18.00)
Average daily traffic entering original charging zone*

In comparison vehicle types that would not normally pay the charge have remained broadly stable or increased – with buses up 29% and bicycles up 90% between 2002 and 2008.

* During charging hours (07.00-18.00)

Congestion Charging led to a dramatic and immediate reduction in the volumes of traffic in central London – and profoundly changed the pattern of vehicles seen.

Five years on the effects of Congestion Charging on traffic are more significant than they were when the scheme was first introduced.

* During charging hours (07.00-18.00)
**Congestion**

- Congestion in central zone was initially down, but has gradually increased despite reduced traffic levels:
  - 2003: 30% down
  - 2005: 21% down
  - 2006: 8% down
  - 2007: no change
  - 2008: no change

- In early months of the WEZ, significant congestion reductions, but recent results show congestion now similar to pre-extension levels

- Traffic levels still reduced - increased congestion due to decreased effective capacity as a result of road works and road space allocation to improve conditions for other users

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**So why has congestion returned?**

- Reflects a reduction in effective capacity of road network for general traffic
  - Urban realm improvement schemes (e.g. Trafalgar Square)
  - Pedestrian, cyclist and bus priority measures
  - Increased road works by utilities (particularly water mains) and major developments (e.g. Scotch House Corner development in WEZ)

- Important to balance priorities – activity being undertaken to address congestion levels
Other impacts

- Economy
  - Broadly neutral impact overall on business

- Environment
  - Improved vehicle technology and the introduction of charging have led to reductions in CO\textsubscript{2}, NO\textsubscript{X}, & PM\textsubscript{10}

- Road safety
  - Reduced numbers of cars have led to less personal injury road accidents in the central zone

Revenues

- Net revenues by law must be spent on transport

- Raised total of £268m in 2007/8
  - Scheme costs totalled £131m
  - Net revenues therefore £137m

- Allocation of 2007/08 revenues was
  - £112m - Bus improvements
  - £13m - Roads and bridges
  - £4m - Road safety
  - £4m - Walking and Cycling
  - £2m - Borough plans
  - £2m - Environment
WEZ Consultation

The Mayor's election manifesto included a commitment to hold a consultation on the future of the Western Extension of the Congestion Charging Scheme.

Managing the road network

Mitigation of increased road congestion through a range of policy levers
London – Managing Road Capacity

Case study - Managing the road network
The Mayor’s Transport Strategy – Smoothing Traffic Flow

• Smoothing traffic flows to better manage congestion
• Maximise efficiency of road network
• Increased focus on journey time reliability
• Selection of routes where percentage of journeys to be completed within 5 minutes of specified, typical time
• Ultimately reduce CO₂ emissions as flow of traffic will be constant

Managing the Road Network: key elements

• Journey Time Reliability and Smoothing Traffic Flow
• Capacity and resilience
• Safety
• State of good repair
• Better streetscapes
• Environmental outcomes
• Customer outcomes
• Efficiency

ITS has a considerable role to play
Smoothing Traffic Flow – 6 Major Elements

Traffic Operations in London

- London’s Traffic Signal Authority
- 6,000 sets of signals (50% computer controlled)
- London Streets Traffic Control Centre – real time intervention, 24/7
- 1200 CCTV
- 1900 ANPR monitoring and enforcement cameras
- 135 variable message signs
Traffic signal coverage

- Local control (51%)
- Computer controlled fixed time (19%)
- Computer controlled dynamic SCOOT (30%)

Traffic Signal Timing Reviews

- Year 2000 = timings reviewed once every 27 years
- Year 2009 = UTC signals and other critical sites reviewed once every 3 years
- Timing Review:
  - responds to local feedback
  - balances local demands
  - accounts for local land use changes
  - tackles persistent congestion
Timing Review – Road Traffic Goals

- Network stability and resilience
- Target degree of “saturation”
- Practical limits on signal cycle time

IRID - Image Recognition and Incident Detection
Measuring Smoothing Traffic Flow

Definition:

The Mayor's aim in smoothing traffic flow is to:

‘Increase the reliability and predictability of journeys, including by tackling “stop-start” traffic conditions which increase emissions of harmful pollutants’

The aim of the work is to improve conditions for existing road users (including cyclists and pedestrians), not to create additional capacity that would increase car journeys.

Why journey time reliability is so important

- Cost to the economy – lost productivity due to delays and mitigations (e.g. allowing more travel time to compensate for delays)

- CBI London business survey (December 2008) reported that 78% of respondents thought the quality and reliability of the road network was less than satisfactory or poor. Source: [http://www.cbi.org.uk/pdf/20090218-CBI-Time-to-Change-Gear.pdf](http://www.cbi.org.uk/pdf/20090218-CBI-Time-to-Change-Gear.pdf)

- Unreliability can affect the supply chain and significantly increase costs for the freight sector (especially just-in-time deliveries)
Journey Time Reliability:

The new draft MTS identifies the need for such a measure, and defines it as:

‘...the Percentage of journeys completed within 5 minutes of a specified typical journey time’

(This ‘specified typical journey time’ has been assumed to equate to an average 30 minute journey, representative of all journeys across London)
London Congestion Analysis Project

A system that takes raw data from available sources of Automatic Number Plate Recognition (ANPR) cameras and turns it into valuable journey time information.

What is LCAP?

An example LCAP 24-hour profile
**Walking and cycling**

- Detection of pedestrians
- Detecting cyclists at signals
- Reliable detection of cyclists at automatic traffic counts
- Pedestrian countdown at traffic signals
- Enhanced walking and cycling travel planning facilities and mapping
- Cycle superhighways
- London Cycle Hire Scheme...

**London Cycle Hire Scheme**

- Launches Summer 2010
- Cashless - Payment via account (use of debit/credit cards)
- Available 24 hours a day
- Chip-enabled membership keys will provide faster and easier access to cycles

- 400 docking stations, spaced approximately every 300 metres
- 10,200 docking spaces
- 6,000 bicycles
Pedestrian Behaviour at Traffic Signals research results

- Published at [http://londonroadsafety.tfl.gov.uk/](http://londonroadsafety.tfl.gov.uk/)

- Nine signal sites in London (all-red junctions) where Green man reduced (9 / 10sec to 6sec) and time re-allocated to traffic green

- Pedestrians observed (video analysis), on-street interviews, accompanied walks with impaired road users

**Conclusions**
- Safety neutral, even with increasing non-compliance
- 2/3 confused about what blackout means
- More impaired pedestrians noticed the change (felt more rushed, unsafe)
- General population did not notice the change
- Pedestrian speeds were unaffected
- Improved traffic throughput

Timing Review – Pedestrian Goals

- Pedestrian ‘degree of saturation’ (over crowding)
- Duration of the invitation to cross (green man)
- Signal Cycle time
Pedestrian Countdown

An example from Auckland

Freight – loading and parking

Loading bay reservation system

- Cooperative Vehicle Infrastructure Systems (CVIS) trial of booking system for a freight loading bay

Freight specific sat-nav information

- Exploring how size/weight and stopping/loading restrictions can be made available through sat-nav databases
- Improve availability of dynamic data such as congestion and journey time
CVIS Trial in London

CVIS Roadside Signage
CVIS Enforcement

Driver training

- First Group trial in 1,000 buses in London using in-vehicle monitoring devices
- Real-time feedback on driving style and driving reports to focus training
- Around 5% fuel saving
- Explore possibility of similar applications for other professional drivers
Future development / Issues for Discussion

Congestion Charging
- Primary issue concerns public acceptability
- ITS role in refining charging systems to make them more equitable
- Political support is critical – role for EC?

Traffic Management – role for ITS
- Improved traffic management tools for rapid detection and response to disruption – real time information
- Improved detection of pedestrians and cyclists
- V2V and I2V communications
- Situational Awareness; leading to a predictive capability

Input from EC
- More focused towards needs of (big) cities eg ITS Action Plan
- Facilitating role to bring comparable cities together
- Encouraging cities to become more involved with call writing
- Industry needs to fully take into account transport needs of cities
- Less bureaucracy, please !!!

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