REGULATORY AND FISCAL TOOLS TO MANAGE DEMAND FOR CAR USE IN CITIES

Presentation by
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Managing demand for car use

- Why control car use?
- Which tools are available?
- How do they perform?
- What are the implementation challenges?
- A possible implementation plan
- Policy implications and priorities
Why control car use?

- To improve efficiency
  - by reducing congestion and unreliability
  - and hence improving bus, tram services
- To enhance the environment, health, safety and sustainability
  - by reducing vehicle-km travelled
  - by limiting congestion-induced pollution
- To generate revenue
  - for investment in public transport
    - as an alternative to car use
Why control car use?

- These objectives cannot be fully achieved otherwise
  - Improving road capacity
    - will reduce congestion in the short term
    - but will attract additional car use
  - Improving public transport
    - will make conditions better for public transport users
    - and will attract additional public transport use
    - but only a small proportion will come from car use
- What targets should be set for levels of car use?
  - for many western cities -15% appears optimal
  - for CIS cities further growth may be acceptable
  - but need to consider setting targets for 2010 to 2020
### Which tools are available?

<table>
<thead>
<tr>
<th>Type of constraint</th>
<th>Constraint imposed on</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ownership</td>
</tr>
<tr>
<td>Regulatory</td>
<td>✔</td>
</tr>
<tr>
<td>Physical</td>
<td>n.a.</td>
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<tr>
<td>Fiscal</td>
<td>✔</td>
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</table>
Controls on car ownership

- Car ownership restricted unless parking available (Japan)
  - evidence on impact not available?
- Increased ownership taxes (Hong Kong)
  - annual fee * 3 → cars licensed ↓14%
  - but main impact in poorer, uncongested areas
- Increased ownership taxes plus quota (Singapore)
  - growth in car ownership limited to 3% p.a.
  - auction for permits to purchase cars
  - very high prices (4.5 * manufacturer’s price)
  - substantial revenue generated
  - but encourages higher levels of car use
Controls on parking

- Limits on duration, arrival time, user types
  - reduce on street parking and increase road capacity
  - but encourage traffic searching for spaces
    - which can add to congestion
- Physical closure of parking spaces
  - will have similar effects
- Pricing by act, duration, user type
  - can match demand to supply
  - and reduce searching traffic
  - and generate revenue
Controls on parking

• So comprehensive controls needed
  – for all types of space
  – using regulation and pricing
  – strict enforcement essential

• Limitations
  – private parking (often 50% of space)
    • so need to limit provision in new developments
  – through traffic (often 30% in city centres)

• Predicted impacts (Bristol)
  – Controlling public parking ⇒ traffic ↓ 8%
  – Controlling all parking ⇒ traffic ↓ 23%
Regulatory control of moving vehicles

• Permits to enter city centre
  – traffic entering centre ↓20% to 70% in Italian cities
  – little data on effects outside centre
  – Can reflect need to travel, but expensive to administer
• Licence plate based
  – can reduce car use
    • One day per week ban ⇒ traffic ↓10% in Sao Paulo
  – but may encourage second car ownership
  – and does not reflect need to travel
• Both require substantial enforcement
  – and generate no revenue to pay for it
Physical control of moving vehicles

- Bus lanes, road closures, pedestrian streets
- Restrictive signal control, traffic calming
  - increase delay to car traffic
    - which may reduce car use
    - but may increase congestion
    - and increase journey distance
- Gradual reallocation of road space to buses in Zurich
  ⇒ zero growth in car use over 20 years
- Road closures ⇒ local traffic ↓ 10% to 15%
  - but little evidence on where displaced traffic goes
Fiscal control on moving vehicles

• Fuel price increases
  – reduce traffic: price ↑ 10% ⇒ traffic ↓ 3%
  – but mainly off peak, leisure use
  – principal impact is to use more fuel efficient cars

• Road pricing
  – charge to enter a defined area
    • 1975 Singapore scheme, Norwegian toll rings
      – can be manual or electronic
  – charge to use vehicle in a defined area
    • London Congestion Charging
      – electronic enforcement
  – charge to pass key points in the road network
    • 1998 Singapore electronic road pricing
  – charge per kilometre travelled
    • under development using GPS technology
Fiscal control on moving vehicles

- Singapore area licensing
  - €8 traffic ↓ 45% in centre
  - with little change outside
- Norwegian toll rings
  - €2 traffic ↓ 5%
  - but main aim to generate income
- London congestion charging
  - €8 traffic ↓ 15% in centre
  - and delays ↓ 30%
  - generates around €120 M net per annum
    • to support public transport
Implementation challenges

• Technical problems
  – equipping vehicles for road pricing
  – electronic enforcement generally

• Legal barriers
  – for regulation of car ownership
  – for private parking control
  – for permits for car use
  – for road pricing
# Implementation challenges

## Side effects

<table>
<thead>
<tr>
<th>Possible responses</th>
<th>Likely disbenefits</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not travel</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>New destination</td>
<td>XX</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>New mode</td>
<td>X</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>New time</td>
<td>XXX</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>New route</td>
<td>XXXX</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
</tbody>
</table>
Implementation challenges

- Impacts on the economy
  - reduced access by car, but
    - improved access by public transport
    - better environment
  - so difficult to predict, but often positive
- Equity implications
  - income related: difficult to avoid
    - but revenue redistribution can help
  - location related: reduce by design
  - need related (e.g., disabilities): reduce by exemptions
Implementation challenges

• Public attitudes
  – effectiveness $\uparrow \Rightarrow$ popularity $\downarrow$
  – but use of revenue helps
  – % supporting road pricing
    alone with revenue $\Rightarrow$ public tpt
    London  43    62
    UK      30    57

• Political commitment
  – successful schemes need
    • a committed politician
    • supported by a technical expert
    • effective institutional structures
    • appropriate legislation and enforcement
A possible implementation plan

- Define objectives clearly
- Set targets for car use
  - How much controlled growth should be permitted?
- Select effective, acceptable methods
  - Comprehensive parking control
    - If private parking can be included
    - And through traffic can be controlled
  - Regulatory control of car use
  - Road pricing
- Choice based on
  - Relative acceptability
  - Need for revenue
- Manage use of road space now
  - To protect public transport and manage traffic growth
A possible implementation plan

• Choose complementary policy tools
  – To reinforce the benefits
  – To overcome acceptability barriers
  – To generate finance
  – To protect those who are disadvantaged
• For example, public transport improvements
  – Will help attract people from car use
  – Will make the package more acceptable
  – Will provide an alternative to car use
  – But will require additional finance
Policy implications and priorities

- specify objectives clearly
  - different objectives $\Rightarrow$ different solutions
- set target for car use based on objectives
  - to determine acceptable level of growth
- constraints can be regulatory, physical, fiscal
  - fiscal measures are probably most effective
- constraints can be on ownership, parking, moving
  - moving vehicles controls are most effective
Policy implications and priorities

• road pricing performs best
  – for efficiency, environment and revenue
• parking charges can be effective
  – if private parking, through traffic controlled
• regulatory controls can be effective, given good enforcement
  – provided that revenue is not needed
• physical reduction of roadspace can manage traffic growth
  – and should be used as an initial approach
• enforcement will be expensive unless automated
  – more development of technology is needed
• legislation is needed for private parking, road pricing, permits
Policy implications and priorities

• Unwanted side effects will occur
  – identify early and design to avoid
• Impacts on the urban economy are uncertain
  – though likely to be positive; good design can help
• Inequities will relate to income, location, need
  – identify early, design to reduce, exempt if needed
• Many will be opposed to traffic restraint
  – but providing alternatives to car use will help
Policy implications and priorities

• Integration of measures is essential
  ⇒ Reinforced impacts, reduced side effects
  ⇒ Increased acceptability, enabling finance
• Effective complementary measures include
  – public transport improvements
  – enhancements for walking, cycling
  – travel plans and awareness campaigns
• Progress will only be made with
  – a committed politician able to act
  – a technical expert able to implement
  – an effective institutional framework
  – appropriate legislation and enforcement