SUSTAINABLE URBAN DEVELOPMENT AND TRANSPORT

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The New Imperative

381 ppm
2005

CO₂ (ppmv)

age (yr BP)
EU White Paper on Transport - 2001

1. Integration of transport in sustainable development
2. Break link between economic growth and transport
3. Shifting the balance between modes

Energy consumption in transport = 28% of CO$_2$
Could increase by 50% from 1990 to 2010
Road accounts for 84% of this figure
Quality of life in cities – pollution, noise, accidents and congestion
## Changes in Travel

<table>
<thead>
<tr>
<th>EU25 Pass km %</th>
<th>1995</th>
<th>2002</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>75.0</td>
<td>71.3</td>
<td>-5.0%</td>
</tr>
<tr>
<td>Buses and Coaches</td>
<td>9.4</td>
<td>8.2</td>
<td>-12.8%</td>
</tr>
<tr>
<td>Tram and Metro</td>
<td>1.0</td>
<td>1.0</td>
<td>0%</td>
</tr>
<tr>
<td>Rail</td>
<td>6.5</td>
<td>5.9</td>
<td>-9.3%</td>
</tr>
<tr>
<td>Air</td>
<td>8.1</td>
<td>13.6</td>
<td>+67.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Great Britain Total</th>
<th>1975/76</th>
<th>1992/94</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journeys</td>
<td>935</td>
<td>1053</td>
<td>990</td>
</tr>
<tr>
<td>Distance</td>
<td>7536 km</td>
<td>10302 km</td>
<td>10933km</td>
</tr>
<tr>
<td>Journey Length</td>
<td>8.06 km</td>
<td>9.78 km</td>
<td>11.04 km</td>
</tr>
<tr>
<td>Air travel distance per person per year</td>
<td>65.6km</td>
<td>124.8km</td>
<td></td>
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</tbody>
</table>
The New Realism

Stage 1 - Consensus that projected traffic growth is not sustainable

Stage 2 - Proposed road schemes will not solve the problem

Stage 3 - Limitations on the use of the car and substantially raising the costs of travel

Stage 4 - Awareness of the environmental and social costs of unlimited mobility

Stage 5 - Reduce the need to travel - the only means to improve the environment and congestion
The Universal Problem
Internalising the social costs of transport through the pricing mechanism

1. Fuel duty increases – fuel duty escalator
2. Emissions trading schemes – cap and trade
3. Road pricing – congestion based or environmental based
Carbon Dioxide – Price per Tonne

![Graph showing the price of Carbon Dioxide per tonne from 01/12/2004 to 01/11/2005. The graph indicates a rising trend in the price of Carbon Dioxide over this period.](image-url)
Figure 1 Total external costs 2000 (EU 17) by means of transport and cost category. Road transport is responsible for 84% of total external costs.
£5 daily charge (€7) – now £8 (€11)

174 entry points

£80 penalty for non compliance (€110)

Requires registration of all vehicles

About 50% vehicles have discounts or exemptions

The congestion charging area
Outcomes 2005

- Traffic down 15% entering
- Delays down by 30%
- 15% speed increase in zone
- Increase in traffic of 5% on IRR but journey times remain the same
- Bus services improved – 4% shift from car to bus
- Bus patronage inside area +10%
- 125,000 payers/day
- Environment – emissions -12%
- Net Revenues £68m
Technology has always solved the problems in the past and will solve them now

- Catalytic converters
- Electric, hybrid and hydrogen vehicles
- Alternative fuels
Free electric recharging in Copenhagen and Free unrestricted parking for electric vehicles in London
Hybrid Cars and Lean Burn Technology
Alternative Fuels

Focus FFV can use 85% Bioethanol and produces 30% the CO$_2$ of the same conventional fuelled car.

Hydrogen Fuel buses – 3 operating in London from January 2004
Land Use and Planning

- Reduce journey lengths – higher use of public transport and green modes of transport
- Encourage trip chaining – location of services and facilities in close proximity
- Promoting high quality locations, including public transport interchanges – where people want to spend time at facilities – transport development areas
Sustainable transport policy - Sustainable development

1. Development Principles
2. Social Audit
3. Quality Neighbourhoods and Transport Development Areas
Development Principles

Concentration and Diversity of Activities

Vitality

Environmental security

More attractive and better quality town centres

Less need to travel

Less reliance on the car

More use of green modes and public transport

Economic, Social and Environmental Benefits
1. Density of Development

As density increases
- Average trip length reduces
- Use of the car reduces
- Distance travelled reduces

But causality has not been proved
High density development in London
2. Size of Settlement

The larger the settlement

- Shorter the trips
- Greater proportion of trips by public transport
- Use of car and total distance travelled decreases

Thresholds need to maintain balance between people, jobs and a full range of facilities
New settlement development on green field site
New development around existing settlement
3. Availability of Employment

Increases in consumption of travel by car commuting in UK is 60% from 1981-1991

- Need to put workplaces nearer to where people live, but the nature of work is changing
- Also locate workplaces in larger and public transport accessible locations
1. Social Costs of Closure
   Savings to provider and additional costs to user

2. Social Costs of New Development
   Benefits to local economy and users of the new facility, extra travel (if any)

3. Development Levy
   On locations inaccessible by public transport
Locations where people, public transport and local facilities take precedence over the car

- Clear zones – home zones
- Streets for people – pedestrianisation
- Car free areas
- Transport development areas
- New urbanism – traditional neighbourhood design – transit oriented developments
Clear Zones and limited access areas
- Interchange point at boundary
Streets for People
City Bikes in Copenhagen – 33% of commuting is by bike, with 300 kms of cycle tracks and networks of cycle routes
Car Free Development
Gruenenstrasse in Bremen
Transport Development Areas

1. At public transport accessible locations
2. Encouragement of multi modal trips
3. Office location and retail centres at TDAs
4. Affordable housing units and car free developments
5. The new interchange points where people want to meet and spend time and money
Conclusions

Importance of land use and transport in creating sustainable urban environments

• Tackles the causes of unsustainable transport.
• Meets social concerns about the equity.
• Creates a more efficient transport system.
• Improves the quality of life in cities.