Better Growth, Better Climate: cities and the new climate economy

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Suggested hashtag for Twitter users: #LSEworks
CITIES AND THE NEW CLIMATE ECONOMY
the role of transport and urban form

LSE Works Lecture and Discussion
London, 29 January 2015

THE NEW CLIMATE ECONOMY
The Global Commission on the Economy and Climate

Philipp Rode, LSE Cities / New Climate Economy - Cities
London School of Economics and Political Science
CONTENTS

1. Urban Accessibility Pathways
2. Implications of different transport-urban form pathways
3. Patterns and trends
4. Enabling better urban accessibility
23% of global CO2 [energy related] from transport

doubling of emissions by 2050
emissions from transport under BAU / fastest growing emissions

10 billion trips per day
in urban areas worldwide / increasingly motorised
EU27: INCREASING CO2 EMISSION ONLY FOR TRANSPORT
WAVES OF TECHNOLOGICAL INNOVATION
THE EVOLUTION OF URBAN ACCESSIBILITY PATHWAYS

Source: ADB 2009 based on Barter
THE SELF-REINFORCING CYCLE OF SPRAWL AND AUTOMOBILE DEPENDENCE

Source: Litman 2014
URBAN FORM AND INFRASTRUCTURE: LOCKING IN MOBILITY PATTERNS

Source: LSE Cities 2014

ATLANTA
- Pop 5,430,549
- GDP per capita 54,853$
- 580 people per km² (average)
- Population living 500m from rail based public transport network

BERLIN
- Pop 4,280,544
- GDP per capita 37,147$
- 3,930 people per km² (average)
- Population living 500m from rail based public transport network

Legend:
- urban area
- rail based public transport network
- Modal share in political city:
  - Public transport, walking and cycling (%)
  - Private motorised (%)

8% 92%
32% 68%
IMPACTS OF URBAN TRANSPORT MODES

Environmental impact

- Walking: 0
- Cycling: 0
- Modern Tram: 7
- Trolley Bus: 22
- Tesla Roadster: 40
- London Tube: 47
- Smart: 84
- Diesel Bus: 85
- Scooter: 88
- Toyota Prius: 92
- Motorcycle: 109
- VW Golf TDI: 111
- Average Car: 159
- Ford Explorer V8: 312
- Porsche Carrera GT: 424

Space Consumption

- Pedestrian Standing
- Pedestrian Sitting
- Light Rail at 30 km/h
- Cyclist Standing
- Pedestrian Walking
- Light Rail at 50 km/h
- Bus at 30 km/h
- Bus at 50 km/h
- Car Parking
- Cyclist
- Car at 30 km/h
- Car at 50 km/h

CO2 Emissions (grams per km per passenger)

Square Meters per Person

public transport occupancy of 40% car occupancy of 1.4
LONDON | LOCATION OF WORKING AND LIVING

EMPLOYMENT
PEAK 141,600 jobs/km²

RESIDENTS
PEAK 27,100 pp/km²
CONGESTION: LOSS OF PRODUCTIVITY IN URBAN AREAS

Up to 15% of GDP in Beijing (Creutzig and He 2009); Buenos Aires 3.4%, Mexico City 2.6% and Dakar 3.4% (World Bank 2002)
Traffic Fatalities
Source: Litman 2014
HEALTHIER LIFESTYLES

- It is estimated that physical inactivity accounts for 3.3 per cent of all deaths globally and for 19 million disability-adjusted life-years
- About 60 per cent of the world population do little physical activity
- 40 million Americans classified as obese
- Two 15 minutes trips by bicycle every day are enough to satisfy basic cardiovascular health
- Copenhagen and Munich rank amongst the top 10 healthiest and safest cities
SOCIAL EXCLUSION: PERIPHERALISATION OF THE DISADVANTAGED

SÃO PAULO

RIO DE JANEIRO

BUENOS AIRES

BOGOTA

LIMA
AUTOMOBILE INDUSTRY VALUE ADD AS % OF TOTAL

Source: OECD 2011

- Share of the automobile industry in manufacturing
- Share of the automobile industry in total
3x increase of urban land from 2000 to 2030 (Seto et al 2012)
TOTAL STOCK IN MOTOR CARS

Source: Fulton/IEA 2008
UK DEPARTMENT FOR TRANSPORT TRAFFIC FORECASTS VS. ACTUAL

Source: Goodwin 2012 and Williams Derry 2013
WASTE IN FUEL, CARS, AND ROADS CAUSED BY AUTOMOBILITY
Source: Heck and Rogers 2014

The typical American car spends 96% of its time parked.

An American road reaches peak throughput only 5% of the time... and even then, it is only 10% covered with cars.
AUTONOMOUS VEHICLES: FULL MOBILITY, 1/3 OF VEHICLES

MIT Study (Spieser et al 2014) suggests that a shared-vehicle mobility-on-demand systems can meet the personal mobility needs of the entire population with a fleet whose size is approximately 1/3 of the total number of passenger vehicles currently in operation.
UK REAL COST OF TRANSPORT AND INCOME

HIGHWAY TAXES & FEES AS SHARE OF TOTAL PUBLIC ROAD EXPENDITURES

Source: Buehler, Pucher and Kunert 2009
# ADDRESSING MARKET DISTORTIONS

Source: Litman 2014

<table>
<thead>
<tr>
<th>Distortions</th>
<th>Impacts</th>
<th>Reforms</th>
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</thead>
<tbody>
<tr>
<td>Restrictions on density, mix, and multi-family housing.</td>
<td>Reduces development densities and increases housing costs.</td>
<td>Allow and encourage more compact, mixed development.</td>
</tr>
<tr>
<td>High minimum parking requirements.</td>
<td>Reduces density and discourages infill development.</td>
<td>Eliminate minimum parking requirements, set maxima, require or encourage parking unbundling.</td>
</tr>
<tr>
<td>Underpriced public services to sprawled locations.</td>
<td>Encourages sprawl. Increases government costs.</td>
<td>Development and utility fees that reflect the higher costs of providing public services to sprawled locations.</td>
</tr>
<tr>
<td>Tax policies that support home purchases.</td>
<td>Encourages the purchase of larger, suburban homes.</td>
<td>Eliminate or make neutral housing tax policies.</td>
</tr>
<tr>
<td>Automobile-oriented transport planning.</td>
<td>Favors automobile travel over other modes.</td>
<td>More neutral transport planning and funding.</td>
</tr>
<tr>
<td>Transport underpricing (roads, parking, fuel, insurance, etc.)</td>
<td>Encourage vehicle ownership and use.</td>
<td>More efficient pricing.</td>
</tr>
<tr>
<td>Tax policies that favor automobile commuting.</td>
<td>Encourages automobile travel over other modes.</td>
<td>Eliminate parking tax benefits or provide equal benefits for all modes.</td>
</tr>
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SUSTAINABLE URBAN TRANSPORT ADOPTION

Source: Embarq 2014

Graph showing the adoption of various sustainable urban transport methods, with the following key points:
- Metro - 188 (1863, London, UK)
- Complete Streets - 455 (1971, Portland, US)
- Carfree zones - 360+ (1953, Rotterdam, NL)
- Carsharing - 1,000+ (1987, Zurich, Switzerland)
- Low emission zone - 210+ (2003, Tokyo, Japan)
- Bike sharing - 500+ (1998, Rennes, France)
- Bus Rapid Transit - 160 (1974, Curitiba, Brazil)
- Smart card - 250+ (1992, Oulu, Finland)

The graph tracks the number of cities implementing these methods over time, with a significant increase in adoption from 2000 onwards.

Year


Number of cities
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