The role of mobility in the context of livable cities

Manfred Breithaupt
GIZ – Water, Energy, Transport
The adverse impacts of growth in motorization - in economic, environmental and social terms - are ruining the quality of life in our cities and our global climate.
Humans love to move, travel, discover… by different ways and modes…

Challenges in developing cities
Challenges in developing cities

In most cities, mobility is dominated by personal motorized transport. Many people choose cars to move around...
Road transport is a major contributor to air pollution and climate change. Transport contributes to now 27% of energy-related CO2 emissions and is still growing!
Challenges in developing cities
Challenges in developing cities

Worldwide, 1.3 Million road deaths and up to 50 Million people injured per year
Challenges in developing cities

10-25% of urban areas are taken by road transportation infrastructure - A lot of space for cars but…
Car-oriented transport needs vast space for roads and parking
Challenges in developing cities

...where is the space for people?
the silent pedestrian, the invisible cyclist must be seen
Failures in Urban and Transport Planning

Trends in cities

- Rapidly increasing car ownership and use
- Declining mode share of public transport, walking, and cycling
- Declining city centres; rapid decentralisation into car-oriented suburban sprawl

Focus was given to road design:

- More infrastructure for cars
- More space for motorized vehicles, which let to less density and often to sprawl
- Unsustainable focus
Why going for liveable, sustainable, compact and attractive cities?

- A **liveable** city is a city that provides a high quality of life for its **citizens**

  This requires:
  - Economic strength
  - Social balance
  - Ecological viability

  - All these elements are interdependent
Livable Cities & Urban Life

Rankings of Quality of Living

Mercer Quality of Living Survey 2014 – Top 10 (worldwide):

- Vienna, Austria (1st)
- Zurich, Switzerland (2nd)
- Auckland, New Zealand (3rd)
- Munich, Germany (4th)
- Vancouver, Canada (5th)
- Düsseldorf, Germany (6th)
- Frankfurt, Germany (7th)
- Geneva, Switzerland (8th)
- Copenhagen, Denmark (9th)
- Bern, Switzerland (10th)


Tackling the Problem

Traditional focus was given to road design: More infrastructure for cars, more space for motorized vehicles, unsustainable focus: Question is, how to use limited road space best.
Why public transport priority? Corridor Capacity

(people per hour on 3.5 m wide lane in the city – PPHPD [PAX/hour/direction])

Equivalency road width: In order to carry 20,000 automobile commuters PHPD, a highway must be at least 18 lanes wide.

(assumption 1.2 passengers per automobile)
Adopt Sustainable Transportation Policy and strategies

DO THE RIGHT MIX

Source: Bicycle Innovation Lab
The push and pull approach

Measures with push-effects
Area-wide parking management, parking space restrictions in zoning ordinances, car limited zones, permanent or time-of-day car bans, congestion management, speed reductions, road pricing...

Measures with pull-effects
Priority for buses and trams, high service frequency, passenger friendly stops and surroundings, more comfort, park-and-ride, bike-and-ride..., area-wide cycle-networks, attractive pedestrian connections...

Measures with push- and pull-effects
Redistribution of carriageway space to provide cycle lanes, broader sidewalks, planting strips, bus lanes...., redistribution of time-cycles at traffic lights in favour of public transport and non-motorized modes, public-awareness-concepts, citizens' participation and marketing, enforcement and penalizing...

Transport Demand Management (TDM)

Rationale: “Demand for transport services is not given, but depends on transportation policies, pricing, investments & choices”

Definition: „TDM is a strategy which aims to maximize the efficiency of the urban transport system by discouraging unnecessary private vehicle use and promoting more effective, healthy and environmental-friendly modes of transport, in general being public transport and non-motorised transport“.
## CO₂ emissions from passenger transport vs. modal split: Selected cities, different densities, different lifestyles

<table>
<thead>
<tr>
<th>City</th>
<th>Share (%) of public transport, walking and cycling</th>
<th>CO₂ emissions (kg per capita per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston</td>
<td>5%</td>
<td>5690 kg</td>
</tr>
<tr>
<td>Montreal</td>
<td>26%</td>
<td>1930 kg</td>
</tr>
<tr>
<td>Madrid</td>
<td>49%</td>
<td>1050 kg</td>
</tr>
<tr>
<td>London</td>
<td>50%</td>
<td>1050 kg</td>
</tr>
<tr>
<td>Paris</td>
<td>54%</td>
<td>950 kg</td>
</tr>
<tr>
<td>Berlin</td>
<td>61%</td>
<td>774 kg</td>
</tr>
<tr>
<td>Tokyo</td>
<td>68%</td>
<td>818 kg</td>
</tr>
<tr>
<td>Hongkong</td>
<td>89%</td>
<td>378 kg</td>
</tr>
</tbody>
</table>

Source: UITP
AVOID/Reduce
Reducing the need to travel

SHIFT
Changing mode choice or at least keep the mode share of NMT

IMPROVE
Increasing the energy efficiency of vehicles, fuels and transport operations
The nature of the problem

• Comparing densities: Atlanta and Barcelona at the same scale differ substantially in their consumption of urban land and energy needs.
Atlanta and Barcelona (similar number of inhabitants)

• With about the same population:
  60% of the population of Barcelona is within 600m of a subway line (99kms of subway lines and 136 metro stations)

• To provide the same accessibility (60% of the population within 600m from a metro station) Atlanta would have to build 3,400 km of metro line (compared to the current 74 km) and build 2,800 new railway stations.

Source of information: Alain Bertaud
Example: transit-oriented planning in Tokyo
(Hikarigaoka New Town)

• At terminus of new subway line (opened 2000)
• Mixed use with excellent ‘green’ walking and bicycle network to complement subway and buses
Design and implementation of land use plans

- Curitiba’s solution: Land use and transport plans as part of a Transit-Oriented Development plan

Source: Government of Curitiba
The case of Curitiba: land use and transport
The principles of the sustainable approach

- High density, compact development
- Mixed land uses
- Transit oriented development
- Pedestrian / NMT scale

www.embarqindia.org
Encourage Compact and Mixed Land use

- Mixed Land-use reduces the necessity to make some trips
- Distance traveled is greatly reduced

Source: GTZ Photo DVD
Encourage Compact and Mixed Land use

- Complemented with space for walking and cycling
Transport-related energy consumption
Gigajoules per capita per year

Urban density and transport-related energy consumption

Main Components of Sustainable Transport

- Public Transport with priority over all other modes on the road
- Non-motorised transport
- Creating/conserving public space
- PT Integration
- TDM measures

Do you see these factors here?
Mobility Options like:

- Enhancing Non-Motorized Transport (like Walking and Cycling)
Promoting Public Space

Walking areas, proper sidewalks, cycling network, and car-restricted zones

- More safety for citizens
- More pedestrian space
- More traffic calming measures
- Preserve architectural heritage and aesthetic value

Brandenburger Tor, Berlin
Promoting NMT

Promoting cycling: Amsterdam
Promoting NMT

Promoting cycling: Amsterdam
“In terms of infrastructure, what differentiates advanced cities are not highways or subways but quality sidewalks and cycleways”

Enrique Penalosa, former Mayor of Bogota, Colombia
“The highest priority should go to public transport, walking and non-motorised vehicles that are accessible to almost everyone and have low impacts”

*Enrique Peñalosa*
BRT Guangzhou (Winner of 2011 STA Award)
Street design: Example from Rotterdam
Muenster, Germany - the German cycling City

- Bicycle share rose from 29% in ’98 to 38% in 2007
- 457 kms of cycle network
- 280,000 inhabitants own nearly 500,000 bikes
- Started with a “Vision Zero” road safety policy
- Minimum width of cycle tracks > 2m
- Traffic speeds reduced to 30 kmph
Will our children find our cities as entertaining as playing a video game?

Lyon’s waterfront with bike share
“Quartier Vauban”
Sustainable District in Freiburg, Germany
Quartier Vauban

Freiburg, Germany

Distance from Freiburg’s city centre: 3 km
Brownfield redevelopment
Bottom-up planning approach including potential residents
Celebrated as a model “Sustainable district”

Key Facts
Population: 5,000  Total area: 41 ha  Density: 122 persons / ha
Housing units: 2,000  Jobs on-site: 600  Construction start: 1998

Source: ITDP, 2011
Quartier Vauban

One central parking garage at the edge of the settlement
### Quartier Vauban

#### Sustainable Transport

<table>
<thead>
<tr>
<th>Car Ownership</th>
<th>Number of cars per 1,000 people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>566</td>
</tr>
<tr>
<td>Freiburg</td>
<td>374</td>
</tr>
<tr>
<td>Quartier Vauban</td>
<td>160</td>
</tr>
</tbody>
</table>

Quartier Vauban has a low level of car ownership and promotes non-motorised and public transport.

Sources: WB, 2007; Schiller et al., 2010; ITDP, 2011
Sustainable Transport

In 2002, 39% of Quartier Vauban’s households had carsharing membership (as opposed to only 0.1% nationwide in Germany).

Transport safety is improved by applying traffic calming measures (e.g. 30 km/h car speed limitation).

In 2002, 40% of the households in Quartier Vauban did not own a car.

Restrict car use

Car accessibility to residential streets only for picking up and dropping

Physical barriers restrict access for car users

A key principle was to make car use less convenient than other transport alternatives.

Source: ITDP, 2011
Sustainable Transport

Promote non-motorised transport

Accessibility is improved through design measures and a network of dedicated streets (e.g. boulevard for pedestrians and cyclists)

Direct access to all areas is only possible by non-motorised modes to prevent through traffic, noise, air pollution and improve safety

Non-motorised modal share: 64%

Car free streets at Quartier Vauban
More than half of car-free households were persuaded to move to Quartier Vauban and sell their own car because of: “the unique combination of carrots and sticks offered by the district”

Sustainable Transport

Quartier Vauban’s modal share for all trips:
- Bicycle/walking: 64 %
- Public transport: 19 %
- Car: 16 %

Sources: Green City Freiburg, 2011 ; ITDP, 2011
International Experiences reg livable Cities

Europe:
✓ Zurich
✓ Vienna
✓ Berlin
✓ Amsterdam
✓ Groningen
✓ Copenhagen
✓ Freiburg
✓ Muenster

Non-European Cities:
✓ Bogotá
✓ Curitiba
✓ Singapore
✓ Tokyo

All of these successes featured an integrated and packaged approach:

1. High-quality public transport
2. Improved conditions for walking and bicycling
3. Effective integration of modes
4. Supportive land-use policies
5. Car-restriction measures
Examples: Vienna (#1 Quality of living Index)

Public Transport and NMT
(PT and NMT not for poorer cities, but smart solutions, promoting growth and attractiveness. Proven to be a success factor for high income and successful cities)

- Integrated Transport Policy: PT, NMT and IMT
- Modal Share of PT 36%
- More than 2/3 of journeys are done by PT and NMT
- Vienna top ranked in quality of living surveys conducted by the British consultancy firm Mercer during years 2009 to 2012

The transport paradox  
“Transport is unique as the only development sector that worsens as incomes rise. While sanitation, health, education and employment tend to improve through economic development, traffic congestion tends to worsen.”

...but still: Decoupling of economic growth and individual motorized transport is achievable!
Leadership

World’s best systems were developed with high levels of political support

With strong political will, anything is possible

Lee Myung-bak
Mayor of Seoul

Enrique Peñalosa
Former mayor of Bogota

Jaime Lerner
Former mayor of Curitiba
SUTP Website (Engl., CN, Span.)

- Active since 2002
- GIZ SUTP Publications
- Multimedia (gallery, videos)
- 35,000 visitors (per month)
- Approx. 20,000 downloads (per month)

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Training course manuals

- Bus Rapid Transit
- Public Awareness and Behavioural Change
- Non-motorised Transport
- Travel Demand Management
- Mass Transport Options
- Bus Regulation and Planning
- Financing Urban Transport

WWW.capsut.org
Recent publications

- Measuring Public Transport Performance: Lessons for Developing Cities
  Sustainable Urban Transport Technical Document #9

- Rising Automobile Dependency: How to break the trend?
  Sustainable Urban Transport Technical Document #8

- Urban Transport and Energy Efficiency
  Module 5h
  Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities

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Write to us for any assistance on making Sustainable Urban Transport a reality in your city.

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