Environmentally Sustainable Transport - Main Principles and Impacts

Manfred Breithaupt
Transport Advisor

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.

Imagine China, 2010

Carlos Pardo, 2008

Challenges in developing cities

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In most cities, mobility is stil dominated by personal motorized transport.

Many people choose cars to move around...


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Challenges in developing cities

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Road transport is a major contributor to air pollution and climate change.

Transport contributes to aprox. 25% of energy-related CO2 emissions and is still growing!

Challenges in developing cities

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Challenges in developing cities

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Worldwide, 1.3 Million road deaths and up to 50 Million people injured per year

Challenges in developing cities

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10-25% of urban areas are taken by road transportation infrastructure -
A lot of space for cars but…

Challenges in developing cities

...where is the space for people?
the silent pedestrian, the invisible cyclist must be seen


FGU-454

Failures in Urban and Transport Planning

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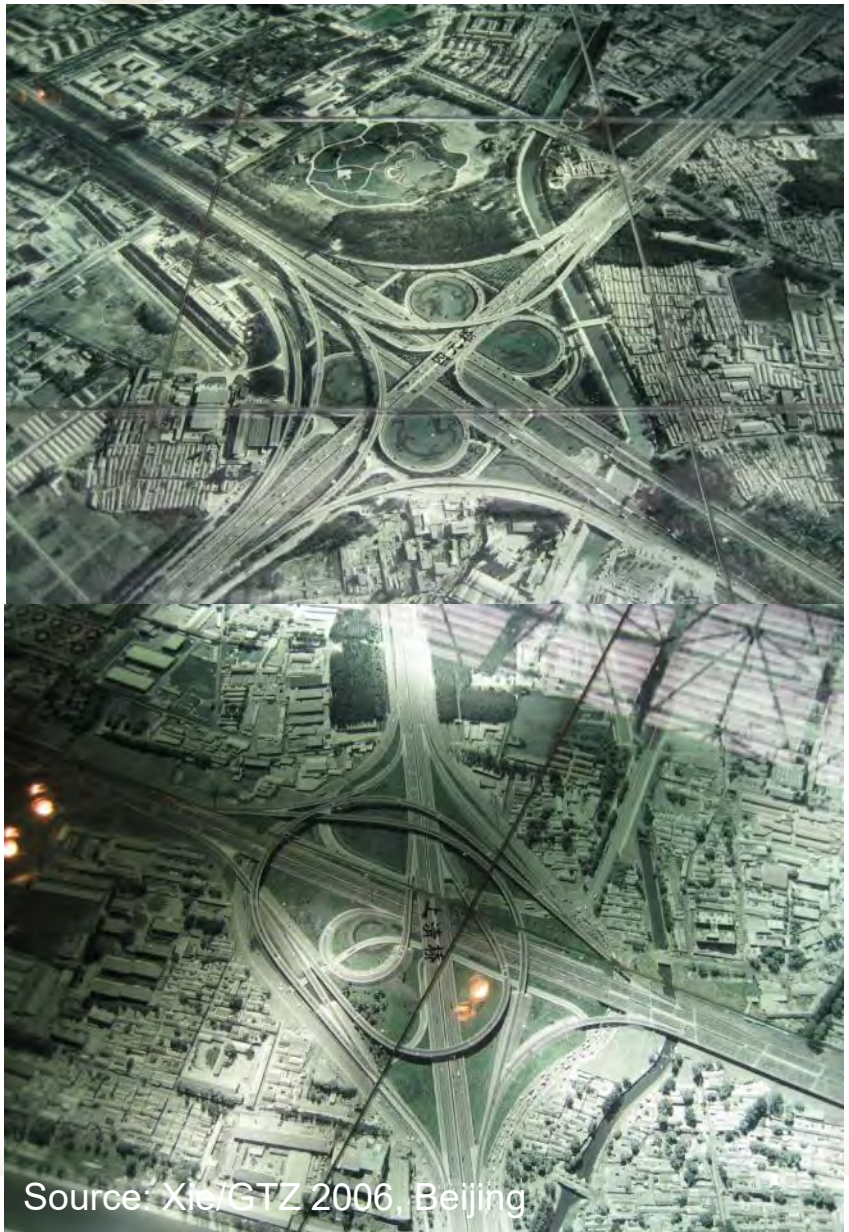
Trends in cities

- 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



Source: Xie/GTZ 2006, Beijing

Road construction can never keep up with demand. Road building is an expensive way of dealing with travel demand. With already now 1,3 billion cars on our planet, where will this end? Some forecasts see 4 billion cars by 2050. This scenario calls for sustainable options.

Source: Karl Fjellstrom

Possible approaches...

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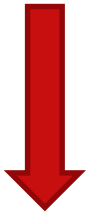
Alternative 1:

Traditional Approach

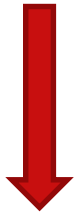


Automobile centered Approach

Known as

Alternative 2:

Sustainable Approach



Contemporary Approach, planning to improve access , planning for people, *moving people not cars*

Key Global Processes on Transport

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Development

RIO+20

$175,000,000,000 For More Sustainable Transport

GOALS

HLP F

SG High Level Advisory Group on Sustainable Transport

Climate Change

PARIS 2015

MARRAKECH 2016

PPMC PARIS PROCESS ON MOBILITY AND CLIMATE

Transport Day 2013 - Warsaw

Transport Day 2014 - Lima

Transport Day 2015 - Paris

TRANSPORT DAYS 2016 SURABAYA | QUITO | MARRAKECH

Habitat III

H III HABITAT III

SLoCaT Key Messages on Sustainable Transport

HABITAT III

ZERO DRAFT OF THE NEW URBAN AGENDA

06 May 2016

TRANSPORT DAYS 2016 SURABAYA | QUITO | MARRAKECH

Quito Action Plan on Sustainable Urban Transport

TRANSPORT DAYS 2016 SURABAYA | QUITO | MARRAKECH

Sustainable Mobility in the forefront of linking the processes to enable transformative action

Sustainable Transport in New Urban Agenda

New Urban Agenda

Transport-Relevant References in NUA:
30 x Transport
21 x Mobility
7 x Connectivity
3 x Walking

Transport-Relevant Components of NUA

- Transit oriented
- Mobility Plans
- Road Safety
- Climate Change – Air Quality
- Sustainable Transport Infrastructure
- Freight Transport
- Land Use Planning
- Inclusive Transport
- Walking / Cycling

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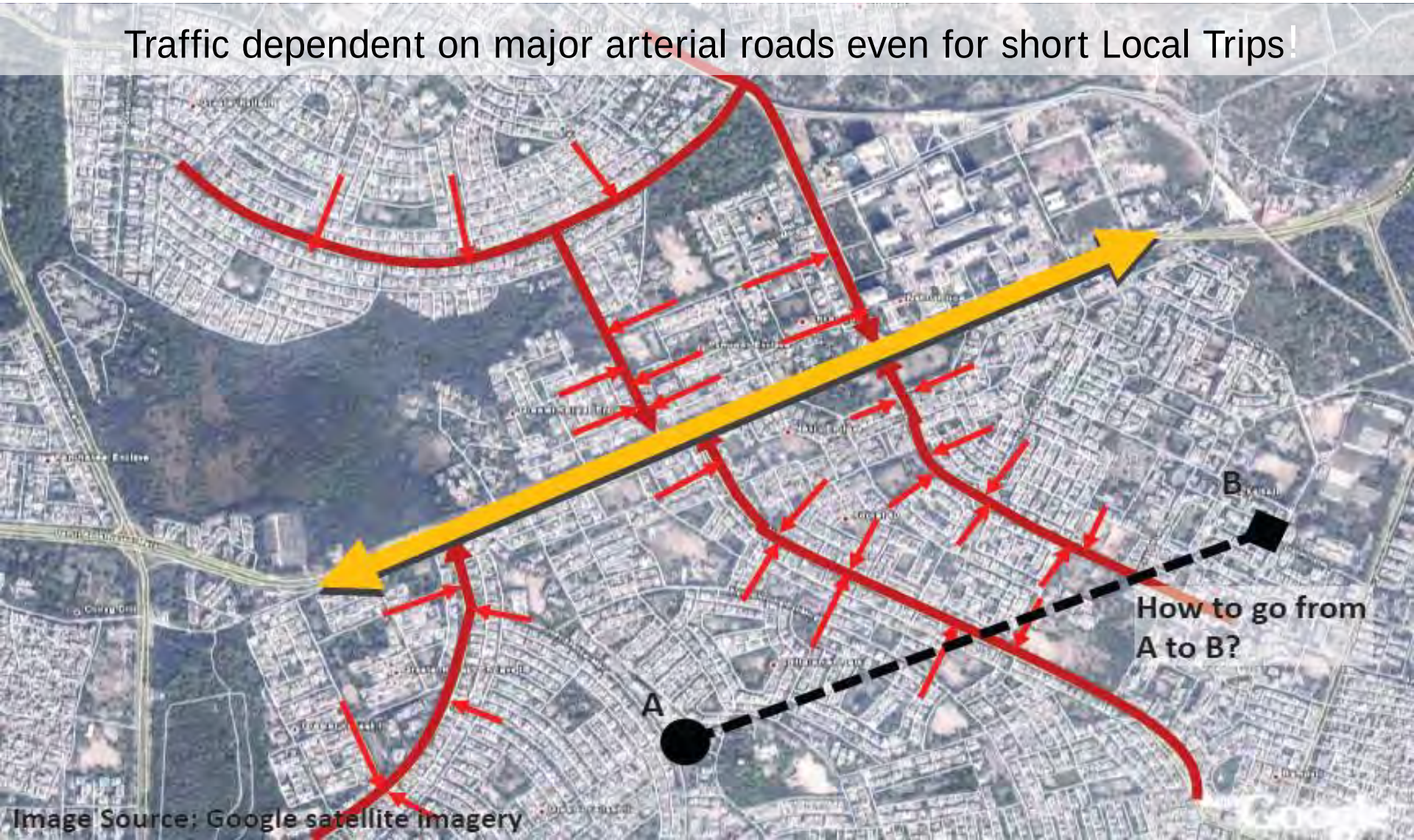
How does this translate into revised planning approaches and policies leading to more livable cities?

... the impact of the traditional/automobile oriented approach

Planning Level

Traffic dependent on major arterial roads even for short Local Trips!



All traffic concentrates on few arterial roads..

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Dhaka current situation

All traffic concentrates on few arterial roads..

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Does anyone want to head in the same direction ?

To summarise

The traditional automobile oriented approach of planning has and will result in

an increased number and length of trips, which means :

- × increased expenses on fuel,
- × traffic congestion,
- × strain on road infrastructure,
- × increase in number of accidents/fatalities,
- x increased pollution
- × excessive dependence on roads,
- × adverse impact on human health.

To address the dynamic complexities of urban systems, a multi-disciplinary, Integrated Transport Planning Process is needed

Solution: What are the options for making cities more liveable?

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Paradigm shift

Achieving greater sustainability in transport means...

... investing in schemes and initiatives that improve accessibility and developing more liveable cities based on non-motorized transport and public transport (and its integration).

Transmilenio, 2005

Why focus on **liveable**, sustainable, resilient, 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

London

Brussels

Vienna

Livable Cities & Urban Life

What influences Liveability?

Direct transport related factors:

- Infrastructure
- Accessibility
- Quality of architecture
- Urban design
- Public Transportation
- Public places
- ...etc.

Other factors:

- Political and social environment (Safety/Crime)
- Socio-cultural environment
- Medical and health considerations
- Schools and education
- Recreation
- Availability of goods/services
- Economic environment (banking services)
- Housing
- Natural environment

Livable Cities & Urban Life

Rankings of Quality of Living

Mercer Quality of Living Survey 2015 – 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*)
- Sydney , Australia (*10th*)

Vienna

Source: VBZ Zurich, 2009, http://vbz.ch.

Zurich

Munich

Source: Mercer, 2015.

Livable Cities & Urban Life

Locational factors

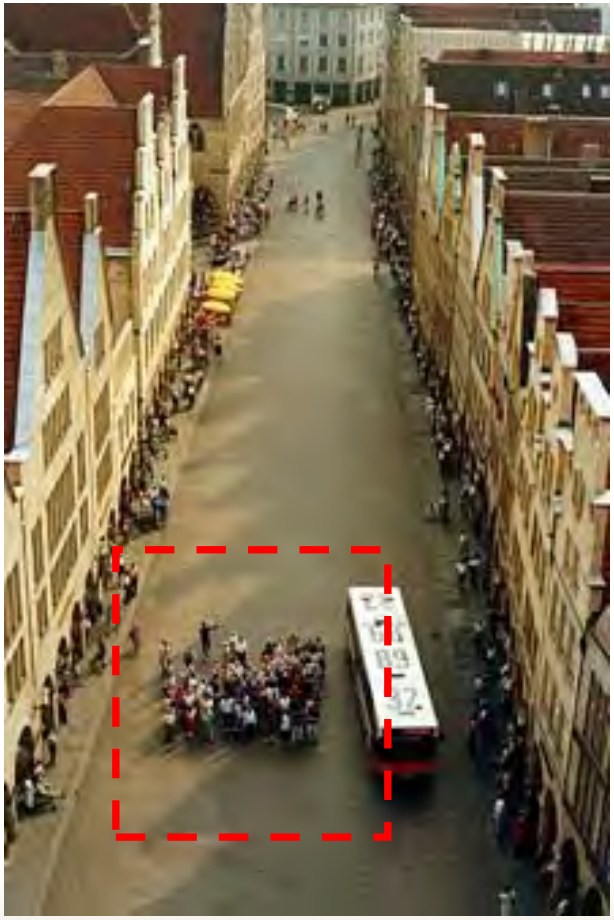
Source: European Cities Monitor 2011, Cushman Wakefield

Six key factors for deciding where to locate a business

% of businesses who consider this to be an 'absolutely essential' location factor

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



Source: City of MünsterMu

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Carlos Pardo, 2008

Claudio Varano, 2004

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

Compact land use (Smart Growth)

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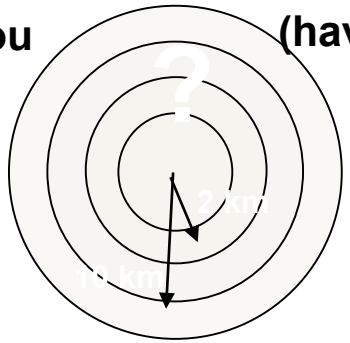
Example: Shopping

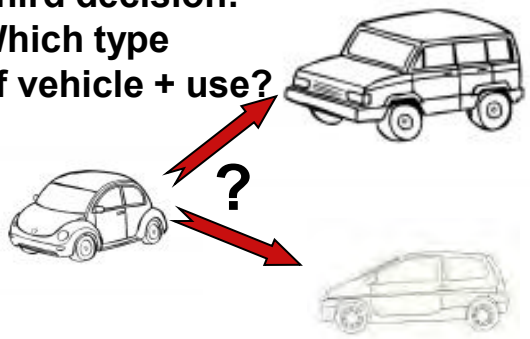
Starting point:
A household requires a wide range of goods, with varying frequency.

First decision:
How far do you have to go?



Second decision:
Which mode of transport will you (have to) use?

Third decision:
Which type of vehicle + use?



Smart infrastructure planning: Reduces need for travelling!

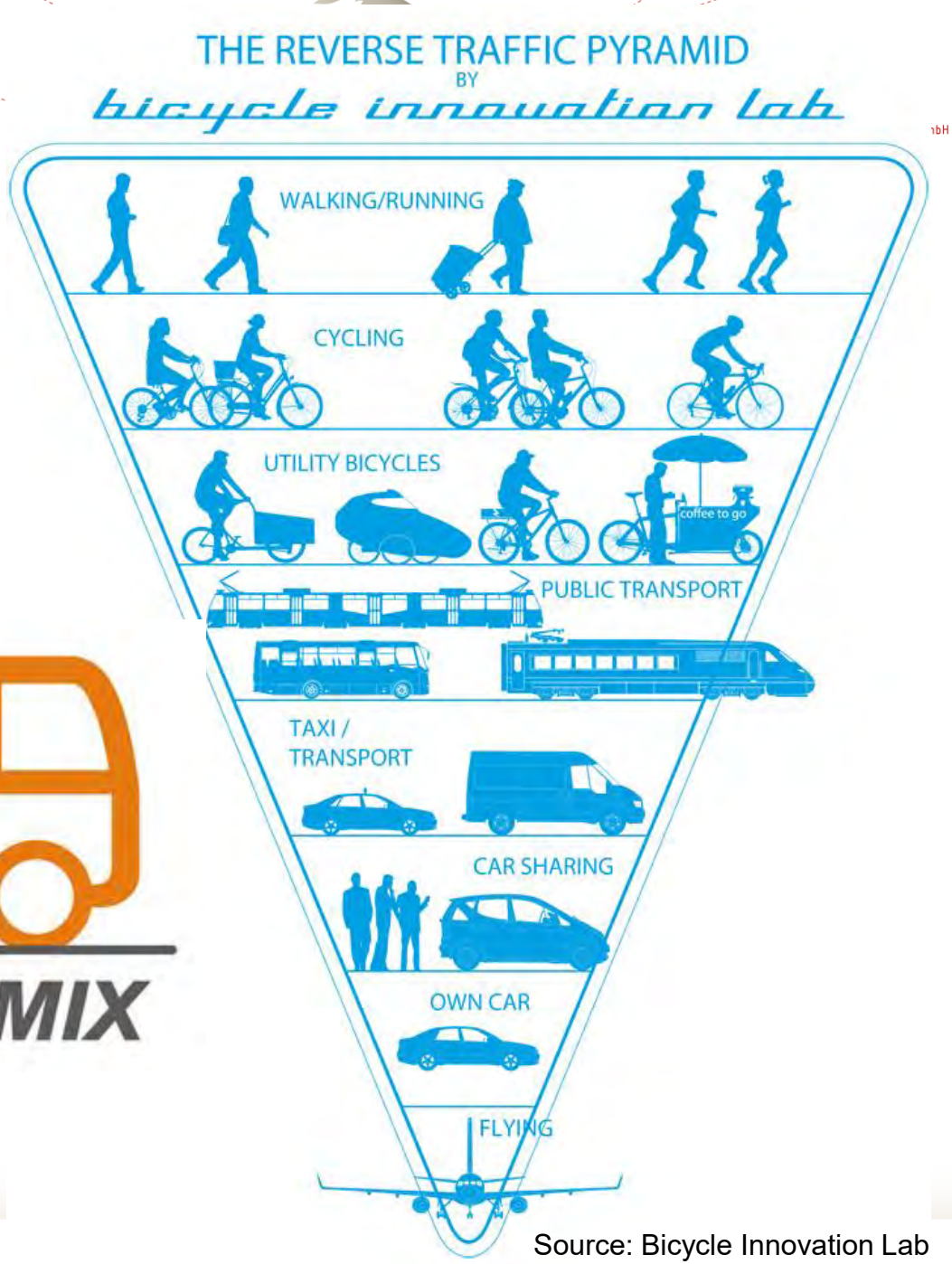
AVOID/REDUCE

Encourage use of non-motorized and public transport!

SHIFT

Reduce car size and consider using alternative fuels!
IMPROVE

Adopt Sustainable Transportation Policy and strategies



Source: Bicycle Innovation Lab

Principle 1: Strong political will and longer term goals

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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

With strong political anything is possible

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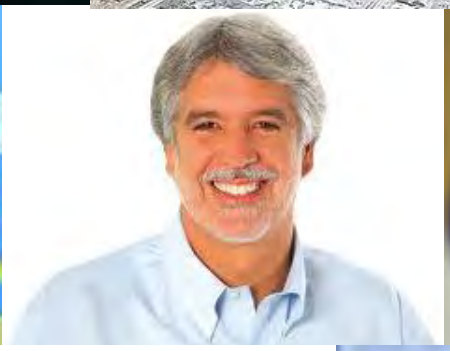


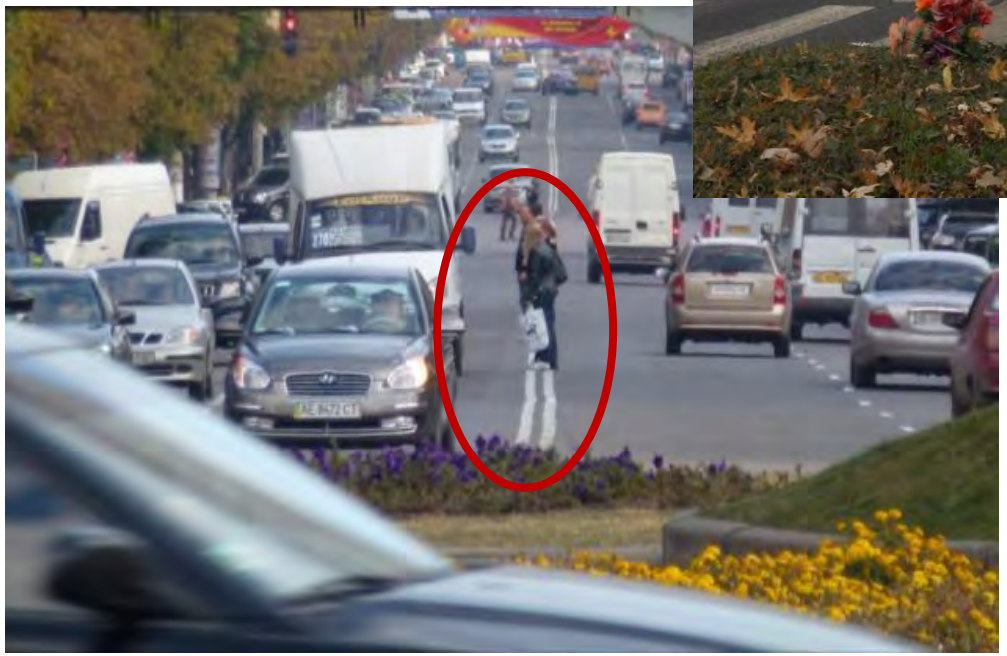


From WRI

Principle 2

Create strong and powerful Metropolitain Planning Authorities (covering the greater Metropolitan Area)

Regular results:



Lviv, Ukraine © Armin Wagner, Mathias Merforth

Overall Challenges in Dev. Cities

Lack of a single lead Authority

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- Under-resourced institutions, lacking in overall capacity to plan, execute, maintain and deliver affordable sustainable urban transport.
- Fragmented policy formulation and implementation with lack of co-operation among multiple ministries and transport agencies. In many cities between 15 and 40 different institutions involved in UT planning and mangement.
- Lack of finances for transport infrastructure and public transport services resulting in extensive institutional and governmental support, concessions and subsidies.
- Insufficient financial procedures and accounting/audit systems.
- Procedural constraints that impede the delivery of urban transport infrastructure and services.
- Inadequate legal and enforcement frameworks and capacities needed for urban transport and land-use developments.
- Absence of comprehensive information systems and public participation.

Multiple Actors (an Example)

- **Centre-level**

  Ministries (Road transport and Highways, Urban Development, Railways, Heavy Industries, Environment, Home, Housing and Urban Poverty Alleviation, Finance, Petroleum and Natural Gas) – policy making, financial assistance, standard setting

  Planning Commission- Five year plans

- **State -or provincial level**
- Transport Department- Vehicle licensing and registration; emission norms

  State Transport Undertakings- Inter and intra city Public transport (bus) provision

  State Development Authorities- carry out city and satellite town planning

  The Public Works Department- has responsibility for roads and bridges in the cities

  Pollution control board- enforces emission norms

  Labour department- enforces labour laws

  Finance Department- budgetary allocations, impose and collect different taxes

- **City-level**
- Local municipal government- provides roads, infrastructure like bus stands, regulates traffic along with Traffic Police, controls construction, etc.

  Local city development authority-discharges town planning functions

  Traffic Police-regulates traffic

  Departments or SOE s plan and manage bus operations

Urban mobility planning allows to overcome antiquated paradigms of transport planning

Traditional Transport Planning	⇔	Sustainable Urban Mobility Planning
Focus on traffic	⇔	Focus on people
Primary objective: Traffic flow capacity and speed	⇔	Primary objectives: Accessibility and quality of life
Political mandates and p… experts	⇔	Important stakeholders are actively involved
Domain of traffic engine…	⇔	
Infrastructure as the mai… topic	⇔	Combination of infrastructure, market, services, information, and promotion
Investment-guided planning	⇔	Cost efficient achievement of goals
Fo…	⇔	…dual efficiency increase and optimisation
Li…	⇔	…nsive evaluation of impacts and shaping of a learning process

„If you plan for people and places, you get people and places.“

„If you plan for cars and traffic, you get cars and traffic.“

Source: Rupprecht Consult, quotations b yFred Kent, President of „Project for Public Space“:

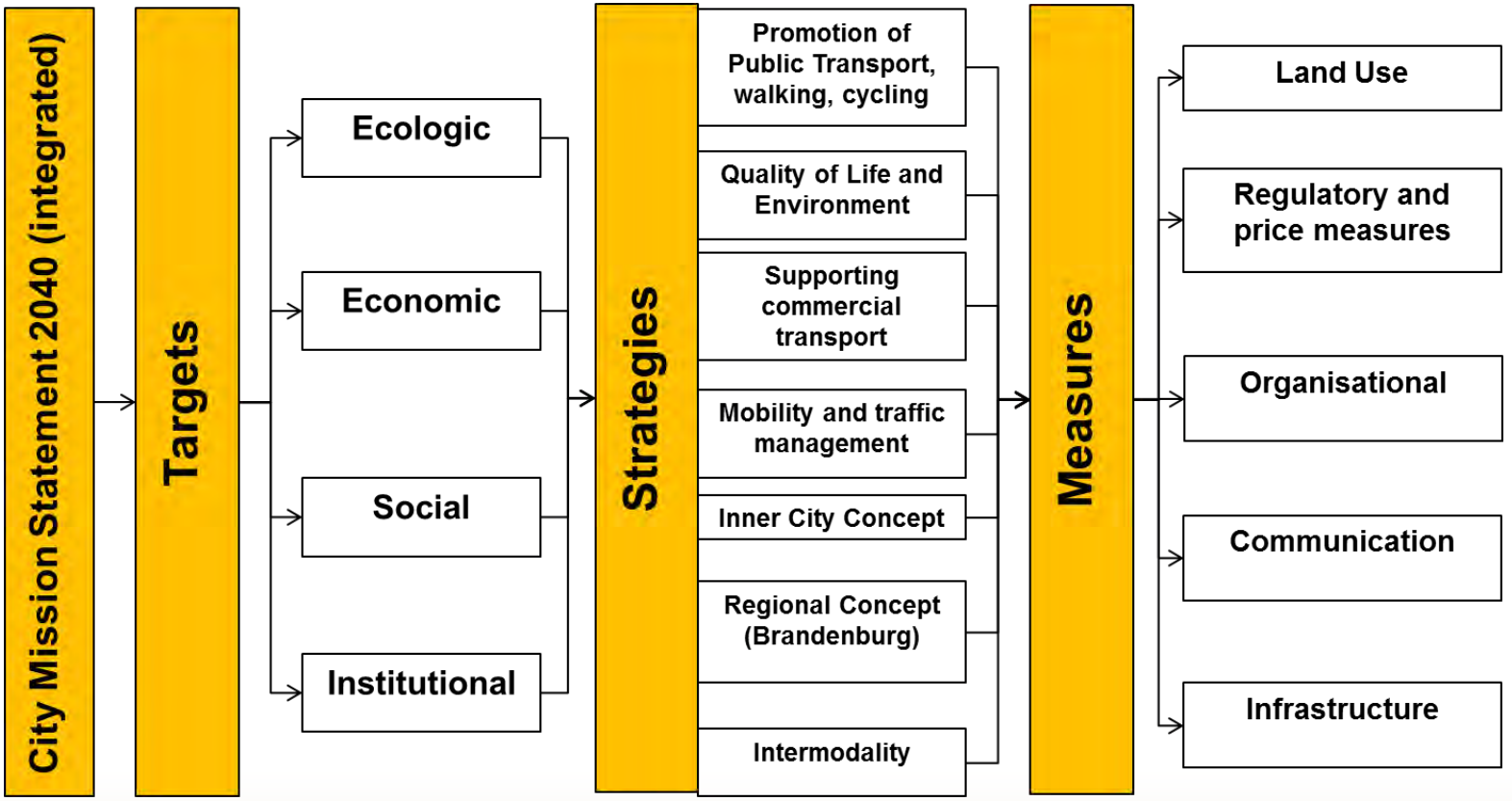
GERMANY – Transport Development Plans

- “non-obligatory” process - but required for receiving national funds for large-scale projects and as input for sectoral (obligatory) plans

- Transport Development Plans required for land-use planning and as base for further strategic planning documents, such as
  - ✓ Local/regional public transport plans
  - ✓ Cycling and Walking strategies
  - ✓ Commercial transport concepts (Freight plans)
  - ✓ Road Safety programmes
  - ✓ Noise reduction plans
  - ✓ Clean-air plans

The Power of Urban Mobility Plans

Example: Integrated Mobility Planning in Berlin



There is an urgent requirement for all metropolitan areas to develop integrated urban transport planning authorities (such as UMTAs), with the target to overcome fragmented and often unfocused planning by the previous multilevel horizontal and vertical Authorities

Examples:

- LTA, Singapore
- TfL, London
- Many European Cities
- Curitiba

Status Quo in most Developing Cities

- Insufficient physical integration of various modes (Rail, Metro, Bus, informal PT) and between PT and NMT
- No integrated and transparent time schedules
- Insufficient cooperation between PT operators
- Signage, customer information systems on PT options, arrival times , connecting services , and fares not appropriate ,and therefore discouraging PT use
- Each change of mode normally requires the purchase of another ticket
- No uniform service level standards among modes and operators

Quality Management ..Looking from Customer Perspective

When developing a viable public transport Industry following factors are important:

- Necessity of customer orientation and evaluation of the quality of the public transport system
- Formulation of quality standards
- Instruments for quality control
- Sanctions and incentives
- Good image of public transport resulting from communication with customers

The need for a strong PT Regulator (Where does it work?

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A Public Transport Regulator is normally responsible for 7 basic processes

- Determination of Policies, Plans and Programs
- Management of contracts with operators
- Supervision
- Evaluation of the operation
- Regulation
- Internal programs and administration
- Solution of Controversies

Singapore

1. Urban Redevelopment Authority (URA): Spacial and Urban Dev Planning
2. LTA: providing plans and basic transport infrastucture
3. Regulator (Public Transport Council PTC)

- PTC is an independent body to safeguard the interests of passengers by ensuring adequate public transport, reasonable fares and at the same time ensuring the financial viability of operators
- PTC has 16 members from a wide cross-section of society

and

Public Transport Operators (PTOs) operate buses and trains

Key Functions of PTC

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- Licensing of Bus Services
- Licensing of Bus Service Operators
- Regulation of Bus Service Standards
- Regulation of Ticket Payment Services
- Regulation of Bus/Train Fares
- Regulation of Penalty Fee
- Feedback & Communications
- Policy Review & Development
- Corporate Management & Services

PT Passenger Satisfaction (%) in 2010

- Security & safety 91
- Accessibility 90
- Comfort 80
- Travel time 85
- Waiting time 68
- In terms of percentage of overall satisfaction, 96% were satisfied with MRT services compared to 92.5% for bus services

The Power of (Sustainable) Urban Mobility Plans

(S)UMPS are a powerful tool align urban transport systems with policy targets!

Sustainable Development Goals

- ✓ Economic & social development
- ✓ Environmental & urban development
- ✓ Social equity & inclusiveness

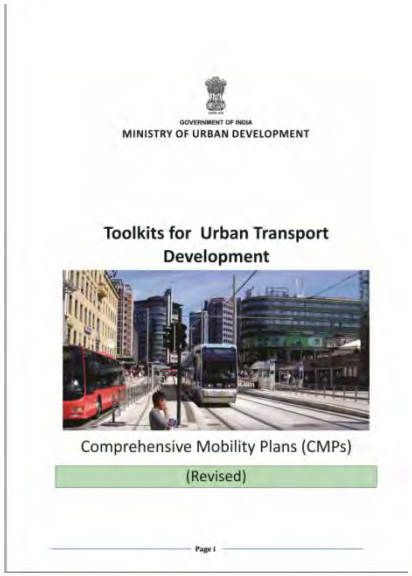
Complementary Plans

Harmonization with Urban development plans, air quality plans, land use plans, noise reduction plans, climate action plans, etc.

INDIA – Comprehensive Mobility Plans

"A CMP presents a long-term vision of desirable mobility patterns (people and goods) for a city and provides strategy and policy measures to achieve this vision. It follows the guidelines set forth by National Urban transport Plan which emphasizes on NMT measures, PT systems and sustainable systems"

- **National Urban Transport Policy from 2005: Comprehensive process description, funding program + national guidance**
- **Toolkits (Guidelines) revised in 2014 (I have worked on the toolkits under a GEF project)**



Key Messages

SUMP Policy Elements in the EU

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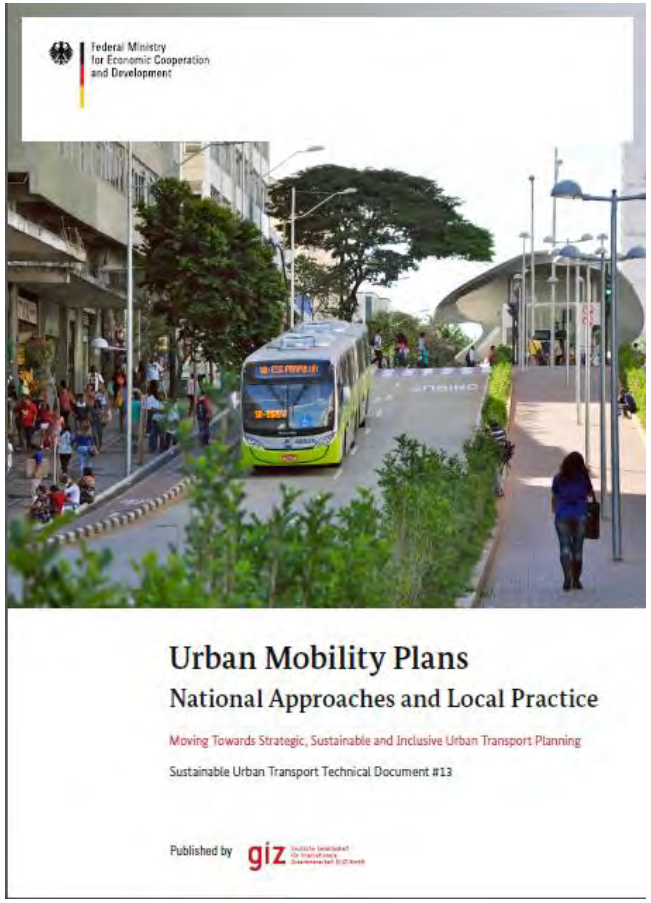
SUMP as an instrument to meet European policy targets and to solve local transport problems

- **EU Recommendation** to all Member States to develop national legal framework for SUMP and support cities
- **EU facilitates** Europe-wide coordination and funds **research** and **innovation activities**
- EU and national **support for SUMP preparation is taking off**
- Quality SUMPs are increasingly a **pre-condition** to attract (major) urban transport funding from EU (incl. Structural and Investment Funds)

Urban Mobility Plans:
National Approaches and Local Practice

- In cooperation with

- Now available at www.sutp.org in English, Portuguese , Indonesian and Spanish language



Principle 3

Urban development and integrated urban transport and urban land use plans

The principles of the sustainable approach

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High density, compact development

Mixed land uses

Transit oriented development

Pedestrian / NMT scale of development

High density / compact development

High density does not necessarily mean high-rise

- High rises require large setback that result in similar density as low rise development
- Mid-rise development (say 80% residences in 6-10 storey apartments) is optimal.
- It is important to note that most S. Asian cities already have high densities

http://www.indie-holidays.com/destinations.php?city=2

Historically, cities were compact

Automobile oriented planning led to expansive cities

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Delhi:

22.3mil/1943sq.km

29,700 person per square kilometer

Mumbai:

16.1mil/546sq.km

30,900 per square kilometer)

http://www.newgeography.com/content/002808-world-urban-areas-population-and-density-a-2012-update

Dhaka:

15.1mil/347sq.km

44,100 per square kilometer)

Mixed land use (at the neighborhood scale)

http://www.leighton.com.au/photo_galleries/plot_9_mixed_use_development_images.html/section/122/page/2

Mixed use can be horizontal (same area) or vertical (same building)

At the neighborhood scale

- Provision of daily amenities and services, (grocery stores, shops, schools, doctors, play grounds, parks, etc), within walking distance of every residence

Advantages

- Encourages walking / bicycling
- Socially optimal
- Permissible mixed use zones can respond to market forces

Caution

- Complimentary, and not conflicting mixed uses, should be located together. For example: hospital and open auditorium should not be located together

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

Robin Hickman, 2008


41 AV
TURNING
WAIT FOR WALK SIGNAL
PASSPORT PHOTO

Transit oriented development

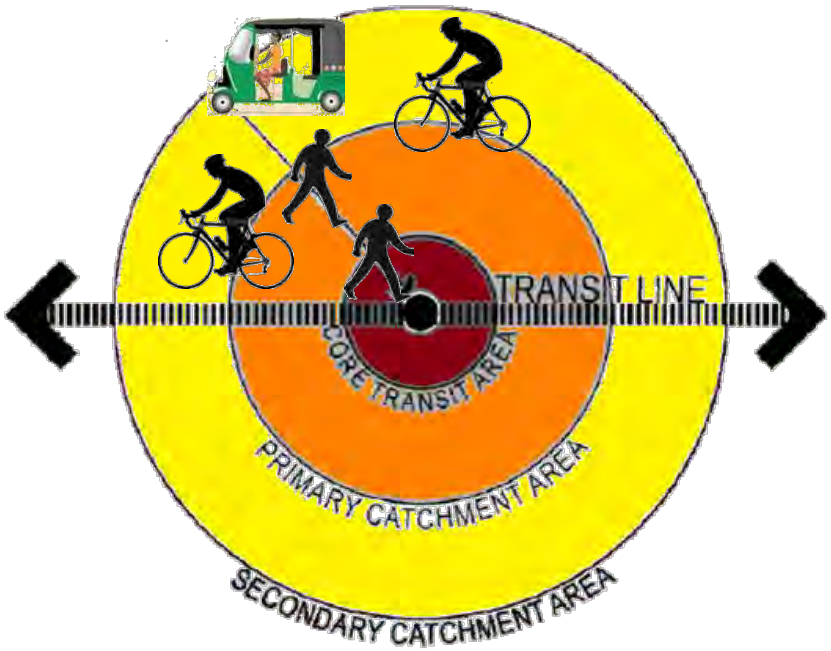
Principles of TOD

- High traffic/commuter attractors & generators to be located closest to the transit station. Such as business, commercial, institutional, high density housing
- Decreasing density of development moving further away from the station
- Strong NMT connectivity and infrastructure to the stations
- Seamless interchange between transit modes and corridors

http://www.setop.es.gov.br/images/TRANSMILENIO.jpg

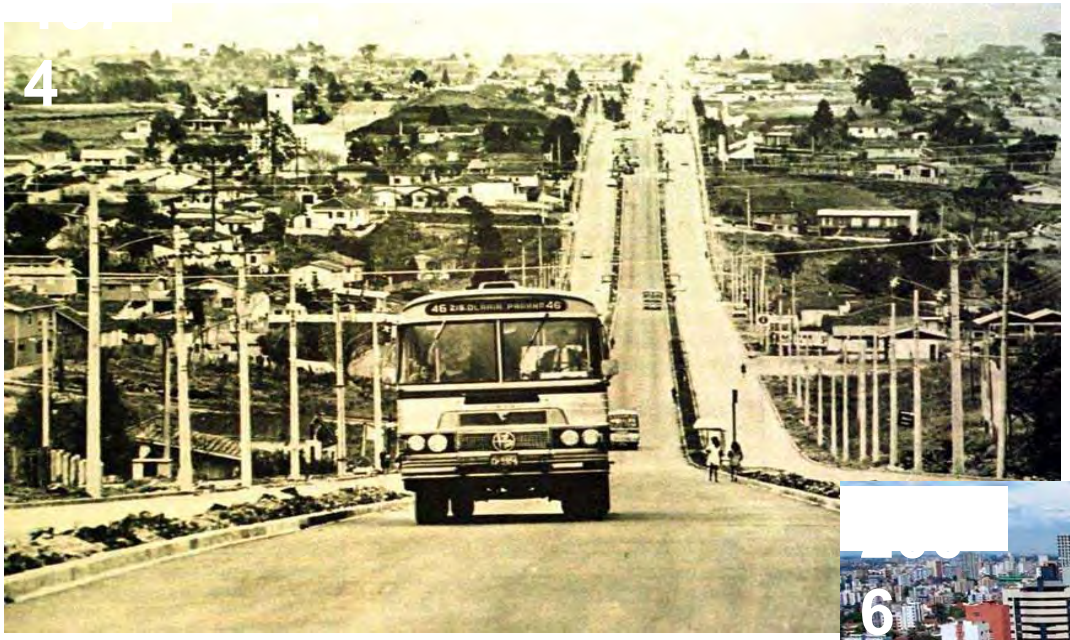
Source: http://www.compassblueprint.org/node/49

TOD Plan



- Core station area (400m): Pedestrian access generates a significant portion of transit trips.
- Primary catchment area (800m): Bike and pedestrian access are major contributors to ridership
- Secondary catchment area (1.5 km): Bike, feeder transit, and auto are the primary access modes to and from the stop or station.

TOD Case: Curitiba, Brazil



The case of Curitiba: land use and transport

… case of Curitiba

TOD effects mode shift …

- 28% of Curitiba's BRT riders previously travelled by car.
- Curitiba's BRT has caused a reduction of about 27 million auto trips per year, saving about 27 million litres of fuel annually.
- Compared to eight other Brazilian cities of its size, Curitiba uses about 30% less fuel per capita, resulting in one of the lowest rates of ambient air pollution levels in Brazil.
- Today about 1,100 buses make 12,500 trips every day, serving more than 1.3 million passengers—50 times the number from 20 years ago.

Source: http://www.urbanhabitat.org/node/344

... case of Hong Kong

TOD creates real estate value ...

- According to the Hong Kong Planning Standards and Guidelines: "Planning for new railways will be integrated with land use planning to optimize the development opportunities around railway stations ... such that the walking distance between railway stations ... and major housing, employment, shopping ... could be less than 500 meters, and all facilities/nodes are inter-connected with well-planned pedestrian walkway network".
- Developers have to pay a premium for land closer to the transit station
- Incentive is given for direct NMT connectivity, (sidewalks, skywalks) to the stations, and support infrastructure (benches, bike parking, low-end retail)

Source: http://www.prdbay.com/UploadFile/20110330140011e.pdf

The principles of the sustainable approach

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High density, compact development

Mixed land uses

Transit oriented development

Pedestrian / NMT scale of development

Walkability comparison

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One-Mile Walk in a Compact Neighborhood

A one-mile walk in Seattle's Phinney Ridge takes you through a grid-like street network with a mix of residences and businesses.

One-Mile Walk in a Sprawling Suburb

A one-mile walk in Bellevue, WA with cul-de-sacs and winding streets has few shops and services within walking distance.

http://www.walkscore.com/walkable-neighborhoods.shtml

Building setback and walkability

Buildings located far from the footpath

Parking located between footpath and buildings

No shade for pedestrians

Result

- No pedestrians on the street!

Cleveland, OH – USA – Source: Google Street View

Building setback and walkability

Buildings abutting foothpath edge

Parking relegated to the back of buildings

Buildings provide shade for pedestrians

Result

- Pedestrians aplenty!

London, UK – Source: Google Street View

Manfred Breithaupt, 2006

Shreya Gadepalli, 2003

Manfred Breithaupt, 2006

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Principle 4

Public (Service) Transport Reform

Just to recall: Main Components of integrated Urban Transport

- Public Transport with priority over all other modes on the road
- Non-motorized transport
- Creating/conserving public space
- PT Integration
- TDM measures
- Vehicles and fuels (Technol. may support)
- Proper institutional set up

Do you see these factors here?

And…we have it all on this photo…

Unattractive public transport systems

- Insufficient physical integration of various public transport modes and between public transport, walking, cycling and private car
- No integrated and transparent time schedules
- Signage, customer information on timetables (Metro Rio), connecting services and fares not appropriate

→ **Discouraging the use of public transport**

Why is public transport often considered to be unattractive?

- Insufficient cooperation between public transport operators
- Each change of mode normally requires the purchase of another ticket
- No uniform service level standards among modes and operators

The reality in most cities:

- Public transport is underdeveloped, not attractive enough for customers (often 2-4 tickets are required to get to work per direction)
- There often exist stand alone systems (Bangkok, Manila, Kuala Lumpur….) without proper physical, time table- and fare-integration, often operating frequencies are to long
- Fares are collected at vehicles (causing slower services)
- Urban transport responsibilities are often fragmented between various ministries, provincial and municipal level

Looking forward:

Public transport integration is the challenge during coming years to considerably increase attractiveness of PT!

What do citizens want?

- ✓ Convenience
- ✓ Easy Access
- ✓ Comfort
- ✓ Frequent Service
- ✓ Rapid journey
- ✓ Safety & Security
- ✓ Customer Service
- ✓ Affordability
- ✓ Have a network

Public Transport should be designed around the customer and not around a technology

Conventional Public Transport Planning Approach

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Step 1. Choose technology

Technology chosen due to manufacturer lobbying efforts

Design chosen to please existing operators

Technology chosen to help property developer

Step 2. Fit city to the technology

Reduce size of network due to financing limitations

Charge higher fares in attempt to pay for expensive system

Operate infrequent services to reduce operating losses

Require large subsidies for lifetime of system's operation

Step 3. Force customer to adapt to technology

Extensive marketing campaign to convince customers that system is in their interest

The innovative and successful approach

Step 1. Design a system from customer's perspective

Rapid travel time

Few transfers

Frequent service

Short walk to station from home / office

Full network of destinations

Low fare cost

Safe vehicle operation

Secure environment

Comfortable and clean system

Friendly and helpful staff

Step 2. Evaluate customer-driven options from municipality perspective

Low infrastructure costs

Traffic reduction benefits

Environmental benefits

Economic / employment benefits

Social equity benefits

City image

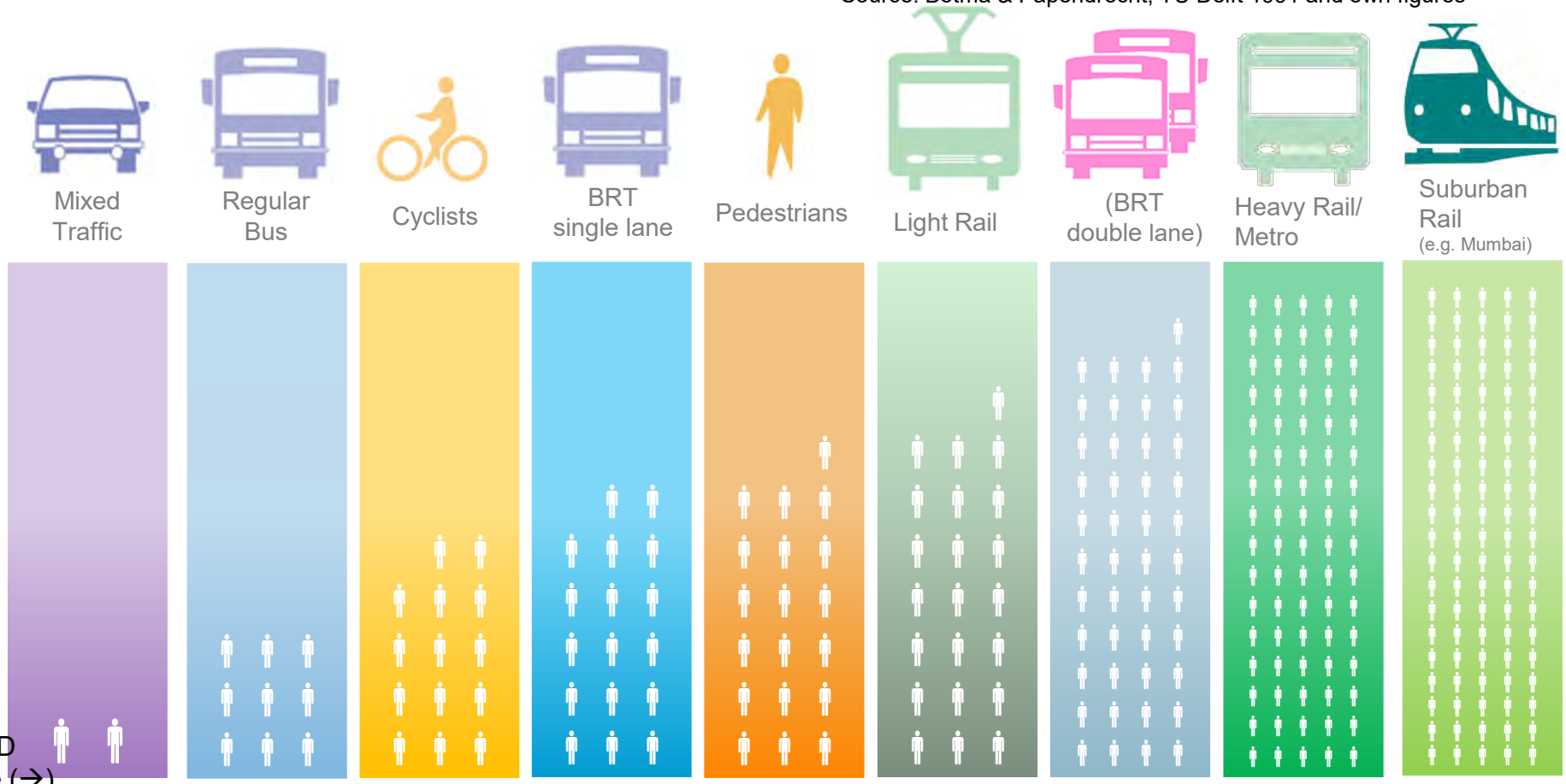
Step 3. Decision

Technology decision based on customer needs and municipality requirements

Why Public transport Priority? Corridor Capacity

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

Source: Botma & Papendrecht, TU Delft 1991 and own figures



	Mixed Traffic	Regular Bus	Cyclists	BRT single lane	Pedestrians	Light Rail	(BRT double lane)	Heavy Rail/ Metro	Suburban Rail (e.g. Mumbai)
PPHPD Range (→)	1500-2000	5000	14000	9000	19000	18000 – 20000		40000 – 60000	60000 – 90000
Maximum PPHPD achieved& where (→)	2000	8000	14000	16000, Curitiba	19000	20000	43000, Bogota	80000, HKK	>100000, Mumbai

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). And what s the capacity of the 22 lanes in front Miracle Hotel? 17000 per dir.

Comparing the costs

BRT
US$ 0.5 – 15 millon / km

Tram
US$ 10 – 25 millon / km

Light Rail Transit (LRT)
US$ 15 – 40 millon / km

Urban commuter rail
US$ 25 – 60 millon / km

Elevated rail
US$ 50 - 125 millon / km

Metro
US$ 60 millon – 320 millon / km

Image source: Manfred Breithaupt

Lloyd Wright


BRT can be very productive
Guangzhou, China
35,800 pax/day/km
Source: EMBARQ

Source: EMBARQ

Light Rail Transit

Budapest Tram

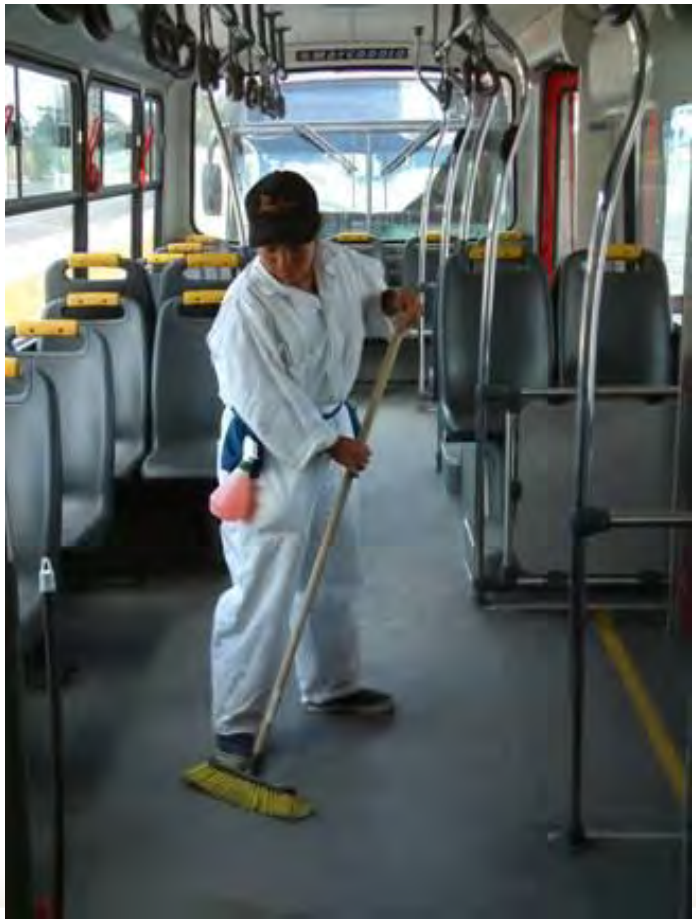
Photo by Carlosfelipe Pardo

SUTP,TDM

SUTP,TDM

BRT – Intermediate to High Capacity Transit

Key from customer perspective: Professionalism in service provision

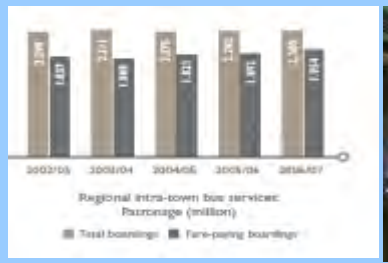


- Are the stations and the fleet clean?
- Do the drivers have good road etiquettes?

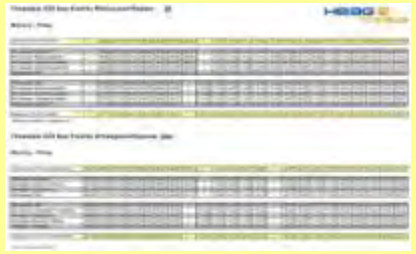
Remember, at the beginning we stated that the PT mode share in Asian cities did not increase.

What to do?: 2 main issues

Public Transport – Quality Control



Public Transport – Integration (physical, fare, institutions, timetables)



And..... Translating policy to targets

Example of Singapore

Policy/Base document	Land Transport Master plan		
Objectives	"Making public transport a choice mode"	''Managing road usage"	"Meeting the diverse needs of people"
Targets	- 85% of commuters to complete their door-to-door journeys within 60 minutes during morning peak by improved transfers and priority - Double rail transit network to 278 km by 2020 - Increase bus speeds to 20-25km/hr from 16-19km/hr by allotting all-day bus priority - Increase overall public transport ridership from 63% to 70% by 2020	- Designed to limit the number of cars that use the roadway system by engaging in electronic road pricing, - Allowing market forces to set parking policies, and - Strictly limiting the number of vehicle registration issued	- Engaging the community, enhancing accessibility by providing barrier-free facilities and keeping fares as low as possible, making transfer stations into "lifestyle hubs," and promoting the use of bicycles and other clean vehicles

Principle 5

Enhance and maintain safe Non Motorized Transport Infrastrucure

SPACE: Priority

Question:
Where is the footpath?
and
Whose is the footpath?

SPACE : Enjoyable

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It is a footpath, not a stair case

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SPACE: Comfort

Pedestrian overpasses uncomfortable
and people seldom use them.

Different forms of Mobility

Mobility Options like:

- Enhancing Non-Motorized Transport (like Walking and Cycling)

Image Source: GIZ-SUTP

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

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Promoting cycling: Amsterdam

Promoting NMT

Promoting cycling: Amsterdam

Street design: Example from Rotterdam

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Measures for Promoting Public Space

Will our children find our cities as entertaining as playing a video game?

Lyon's waterfront with bike share

Promoting cycling: Paris

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Promoting cycling: Paris

- “Velib” public bike scheme started in July 2007 as PublicPrivatePartnership
- Can be used with public transport SmartCard, short-term subscription, credit cards, …
- Has more than 20,000 bikes and more than 1,200 stations
- 110,000 rentals daily
- Vandalism and road safety remain an issue

Manfred Breithaupt, 2006


Judiza Zahir, 2008


Manfred Breithaupt, 2006

Li Shanshan and Liu Shaokun, 2010

Armin Wagner, 2006

Equity

- "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

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Induced Bicycle Traffic

MODAL SPLIT:
37% go to work on bicycle

23% use car

33% use public transport

Cycling in Copenhagen increased by 100% from 1990 to 2000

Why do Copenhageners cycle?

61% Easy, fast & convenient

19% Exercise

6% Financial reasons

1% The environment

Copenhagen Bicycle Account 2006

Muenster, Germany- the German cycling City

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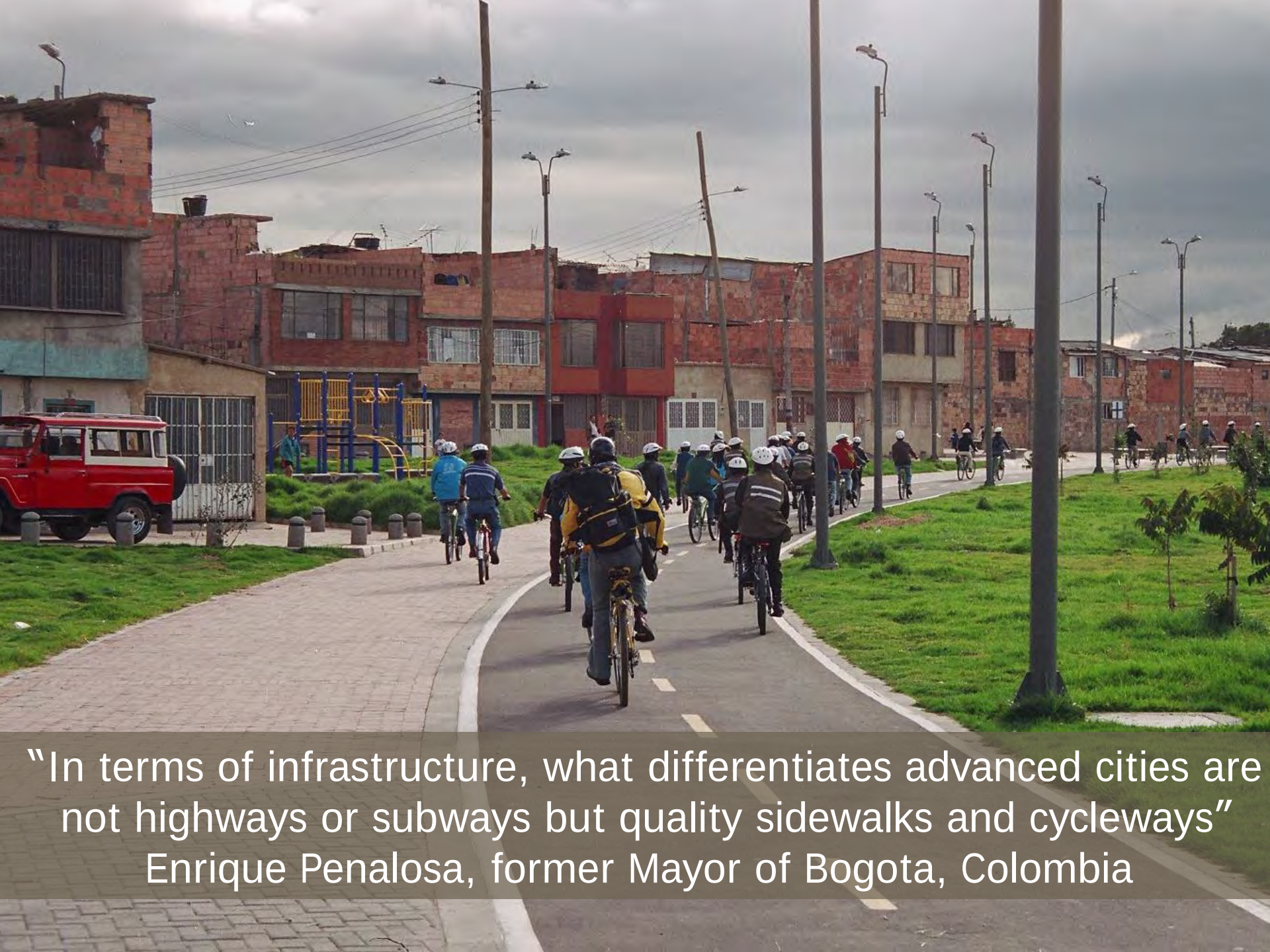
- Bicycle share rose from 29% in '98 to 38% in 2007
- 457 kms of cycle network
- 280, 000 inhabitants own nearly 500, 000 bikes
- Started with a "Vision Zero" road safety policy
- Minimum width of cycle tracks > 2m
- Traffic speeds reduced to 30 kmph


Muenster, Germany


16
velotaxi
www.BSR.de
BSR
BLUE MAN GROUP
THIS WAY.
CURIOUS?
insider



"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

Principle 6

Integrate all means of Public Transport (incl. Informal Transport) with NMT and shared Mobility Offers

Integrated transfer stations (physical integration)

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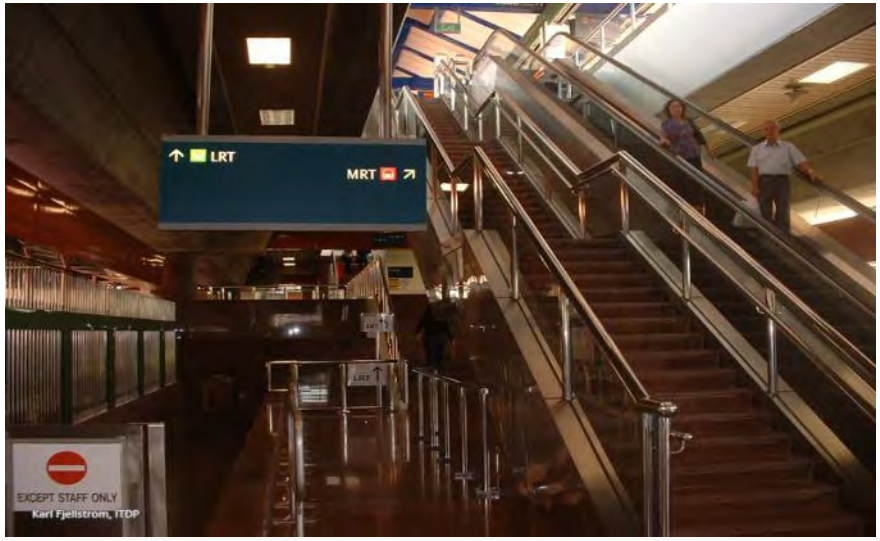
Modal Integration

- Can an individual take his/her bicycle? Is it easy to walk? Should he/she can drive to the station?



Integrated Information & Timetable planning

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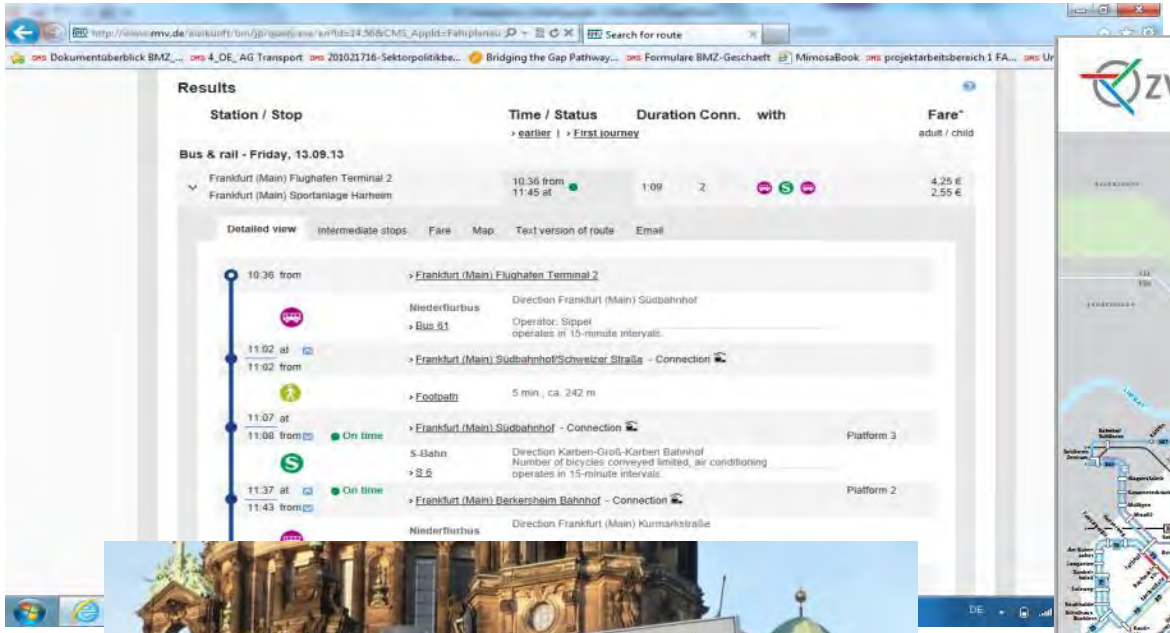

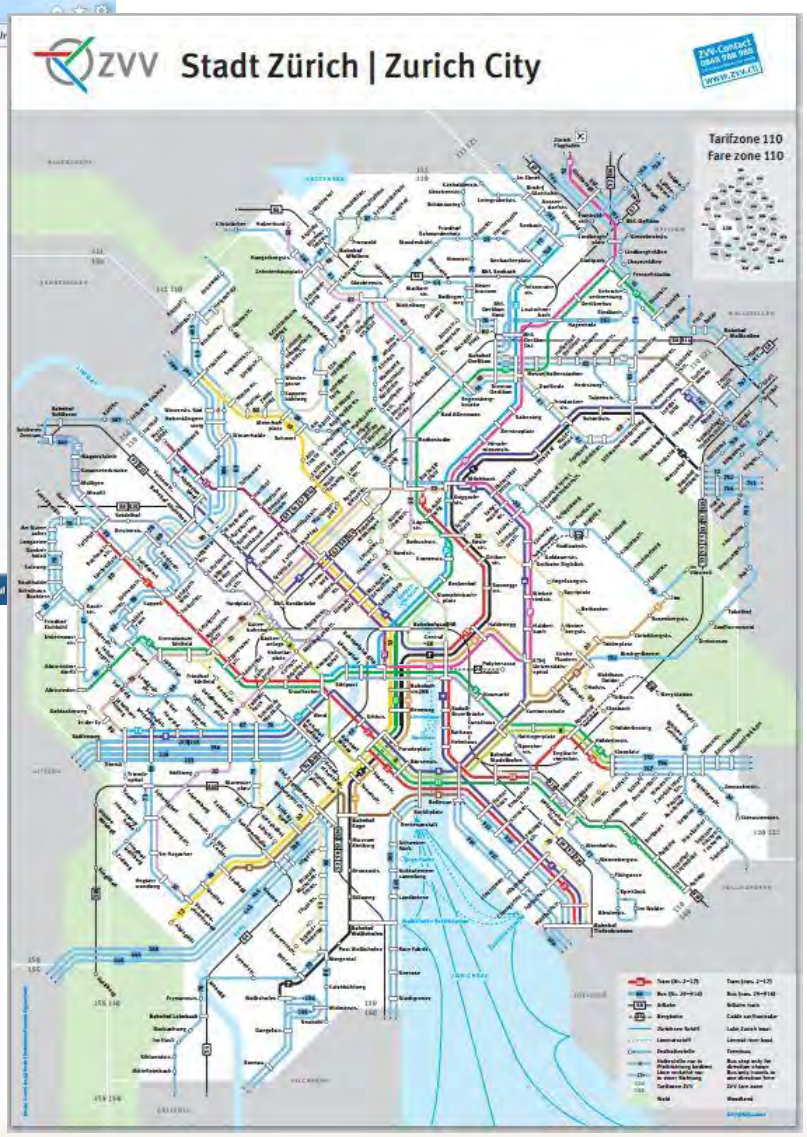

Cycle Integration

Local PublicTransport System in Frankfurt - Corporate Design









International Experiences: Munich

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- Münchner Verkehrsverbund
- „1 network, 1 timetable, 1 tariff“
- Includes all public transport modes with different operators
- Bus, tram, subway, light rail, suburban trains

Integrated Fares & Ticketing

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Again key... Public Transport priority

Is PT prioritized over other modes?

Network coverage

- Can I reach the CBD, shopping district, my home?

Example: Regional Alliance (RMV) - Structure

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Members of the RMV

(The Rhine Main Transit Alliance-Hesse,Germany)

27 partners constitute the

RMV Supervisory Board, thereof:

- 15 rural districts
- 4 large cities (e.g. Frankfurt)
- 7 medium-sized towns
- The federal state of Hessen
    - 368 Local authority districts within the RMV area
    - 153 Transport companies
    - 112 fare systems harmonised and integrated

The Area of the RMV

Ideal: Going for service Contracts for increased Quality

Quality Management - Possible quality indicators

- **Availability**
  (frequency of service, seating capacity, stand-by vehicles, ...)
- **Accessibility**
  (Accessibility of stops, travel speed, transfers, ...)
- **Customer information**
  (Schedule displays and leaflets, sales points, information in case of disruptions, ...)
- **Schedule**, punctuality
- **Customer service**
  (Conduct of personnel, complaints management, marketing, ...)
- **Equipment, comfort, special services**
  (Equipment of vehicles, design, cleanliness, style of driving, ...)
- **Safety**
  (technical safety, personnel, emergency telephones, ...)
- **Environmental standards**
  (CO2 emissions and fuel consumption, noise levels inside / outside, ...)

The Oslo Metro Customer Charter

1. We leave on schedule.
2. We will not leave early.
3. You will be informed of an approaching stop.
4. You will always know where we are going.
5. Information will be available before you board.
6. Information will be available on board.
7. We will answer your questions.
8. You will be informed when things go wrong.
9. Carriers will be clean, making your journey pleasant.
10. We will reply when you write to us.
11. We will listen to you.
12. We pay if you arrive late.

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Principle 7

Transport Demand Management
(using the push and pull Approach)

Congestion Index

WORLD RANK	CITY	COUNTRY	CONGESTION LEVEL	MORNING PEAK	EVENING PEAK
1	Mexico City	Mexico	66% ↑7%	96%	101%
2	Bangkok	Thailand	61% ↑4%	91%	118%
3	Jakarta NEW	Indonesia	58%	63%	95%
4	Chongqing	China	52% ↑14%	90%	94%
5	Bucharest	Romania	50% ↑7%	90%	98%
6	Istanbul	Turkey	49% ↓1%	63%	91%
7	Chengdu	China	47% ↑6%	74%	79%
8	Rio de Janeiro	Brazil	47% –0%	63%	81%
9	Tainan NEW	Taiwan	46% ↑10%	51%	71%
10	Beijing	China	46% ↑8%	72%	84%

Source: TomTom Traffic Index 2017

The challenges in urban transport and TDM

- Urban areas require proper road networks
- New roads attract more traffic and reduce the viability of public transport
- Transport benefits will be offset by future congestion

Transport Demand Management shall

- reduce the total volume of traffic
- promote shifts towards more sustainable modes of transport

with the objectives to

- reduce traffic congestion
- reduce adverse effects on the environment or public health
- generate additional revenue to improve public transport and NMT by pricing mechanisms

Transport Demand Management measures

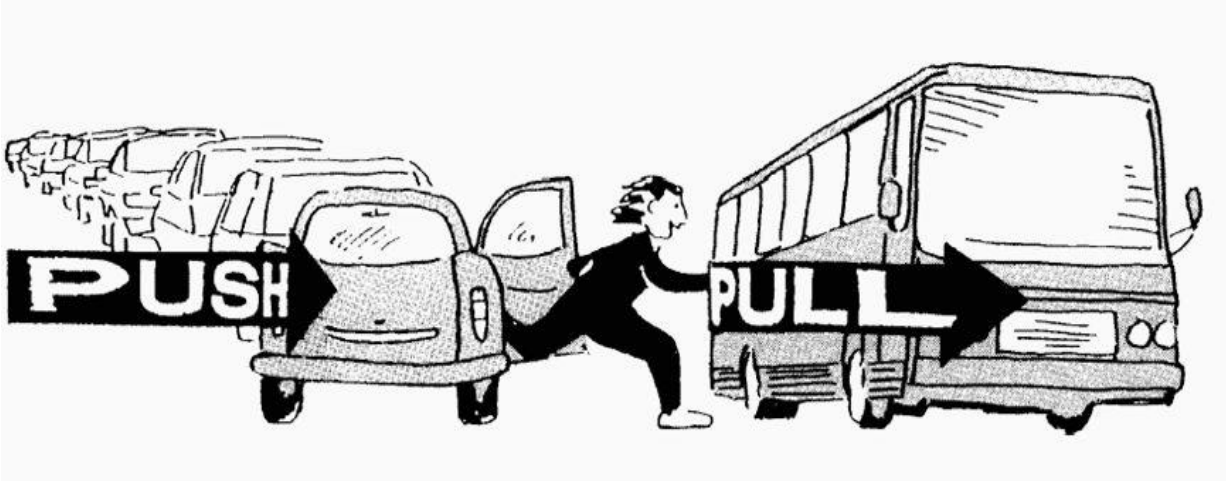
Transport demand management measures (including fiscal policies)

- ❑ Land use development controls: extremely important, not covered here
- ❑ Public transport integration: we talked abt it
- ❑ Parking controls and management : covered here
- ❑ Regulatory controls such as odd/even systems: important TDM measure
- ❑ Physical measures such as bus and pedestrian priority: we talked abt it
- ❑ Pricing & charges through fuels, annual taxes (dealt with in another presentation durch EMDS) : covered here
- ❑ Congestion charging: covered here

TDM policies should never be implemented as isolated instruments, but – for being successful – have always to be embedded in a comprehensive framework of Transport Demand Management measures.

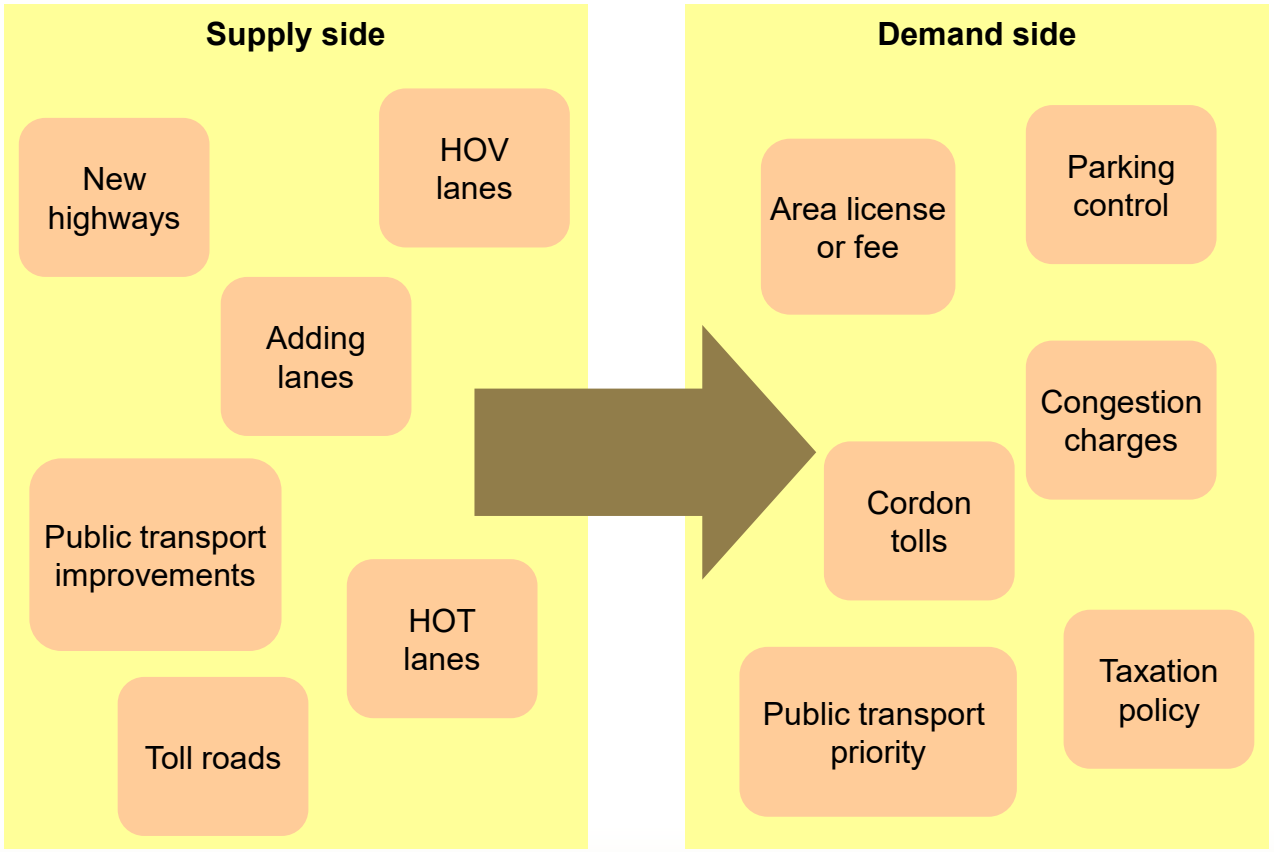
Transport Demand Management (TDM)

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



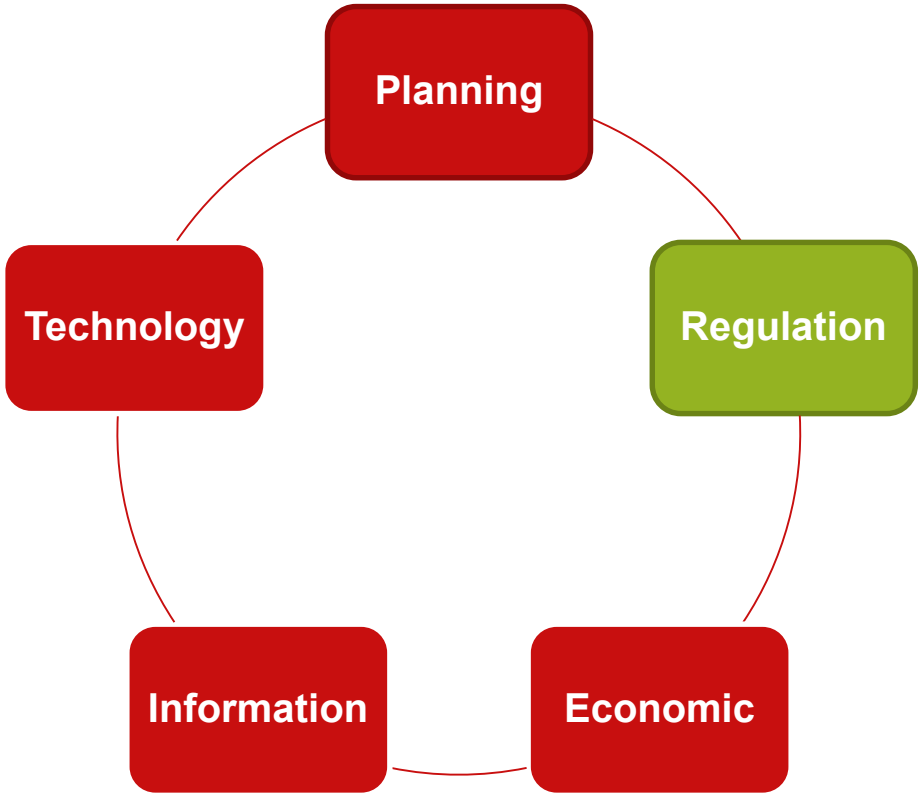
Definition: „TDM is a strategy which aims to maximize the efficiency of the urban transport system by discouraging unnecessary private vehicle use and promoting more effective, healthy and environmental-friendly modes of transport, in general being public transport and non-motorised transport".

The Shift: Thinking Demand instead of Supply



Adapted from Derek Turner Consulting

Travel Demand Management: A Toolbox



Travel Demand Management: A Toolbox

Regulation

	What?	Example
Regulatory Instruments	Physical Restraint	Pedestrian zones
	Parking Management	Parking Maximums
	Access Restrictions	Low Emission Zone
	Speed Restrictions	30 km/h in build-up areas

Case Study: Odd-Even Schemes

Prohibition on motor vehicles from being driven into central areas on certain days of the week.

- **Mexico City**
- **Bogota**
- **Sao Paulo**
- **Manila**

Multiple side-effects limit their effectiveness.

- ✓ Extensive toolbox available
- ✓ TDM with high impact…
  - ✓ reduction of pollution, travel times and accidents
- ✓ …often achievable at low cost

Regarding Economic Instruments, being part of TDM, more in Session 4 this afternoon

Source: Carlos Pardo

Conclusion

"A developed country is not a place where the poor have cars.

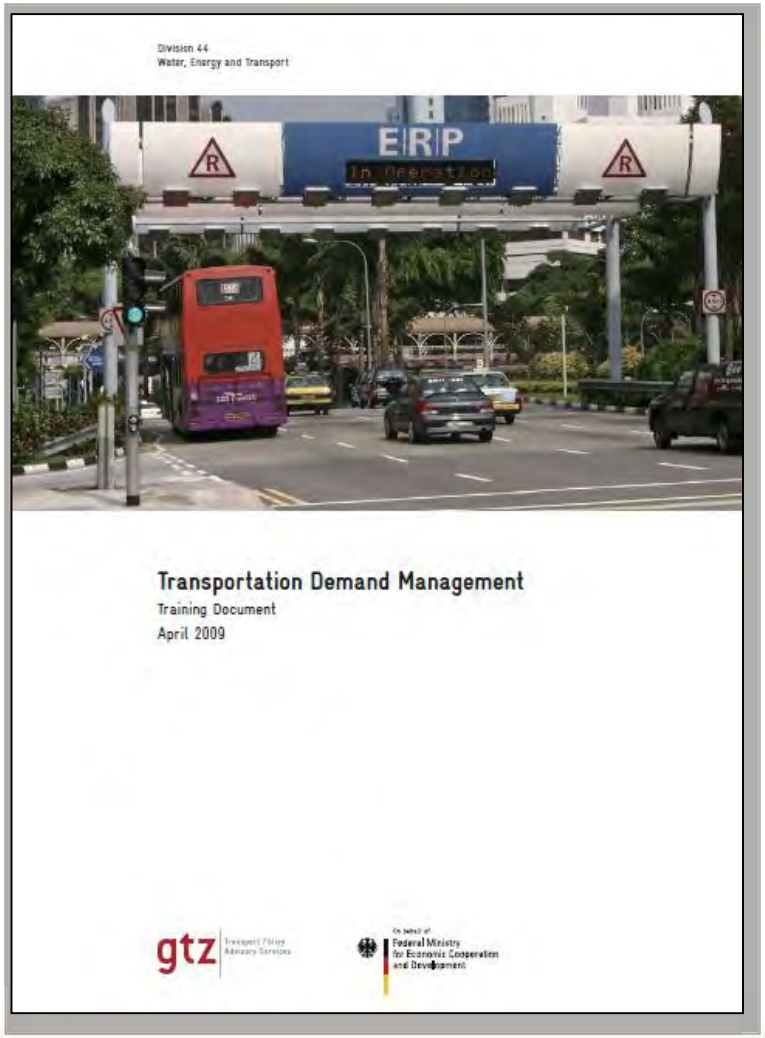
It's where the rich use public transportation.“ - *Enrique Peñalosa*

Further reading

„Transportation Demand Management“

118 pages, full colour document

Free download on www.sutp.org



Principle 8

Financing Sustainable Urban Transport

…….We ll talk about it in Module 4

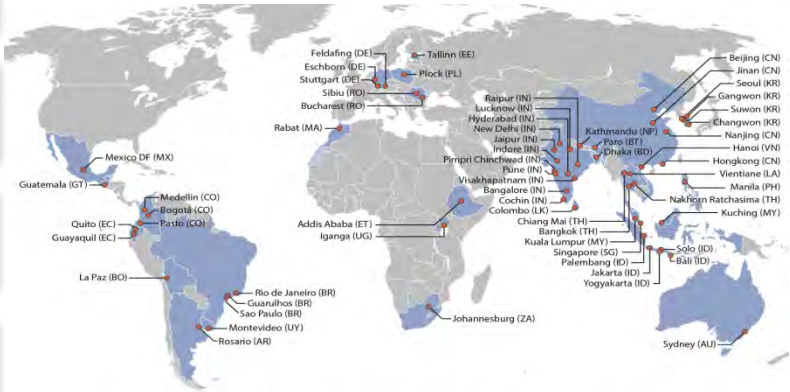
Principle 9

Sharing Knowledge and Transferring Experience

Training Courses: Worldwide Experience

- Sustainable Urban Transport
- Bus Rapid Transit
- Bus Regulation and Planning
- Non-motorized Transport
- Transport Demand Management
- Development of Parking Strategies
- Development of Bike Sharing Systems
- Raising Public Awareness

Until 2017, we have implemented 170 courses with 6000 participants across all continents



Training courses conducted by GIZ-SUTP until October 2013

Training course manuals

- Bus Rapid Transit
- Public Awareness and Behavioural Change
- Non-motorised Transport
- Cycling-inclusive Policy Development: A Handbook
- Travel Demand Management
- Mass Transport Options
- Bus Regulation and Planning
- Financing Urban Transport

WWW.capsut.org

Summing up: International Experiences reg livable Cities

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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 and other TDM measures**
6. **Strong institutional background**

International Experiences

Examples: Vienna (#1 Quality of living Index)
Public Transport and NMT
(PT and NMT not for poorer cities, but smart solutions, promoting growth and attractive-ness. 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 (active transport or EST)
- Vienna top ranked in quality of living surveys conducted by the British consultancy firm Mercer during years 2009 to 2012

Source: M. Breithaupt, 2009, http://www.wien.gv.at/

Relationship between GDP per Capita and Individual Motorized Modal Share

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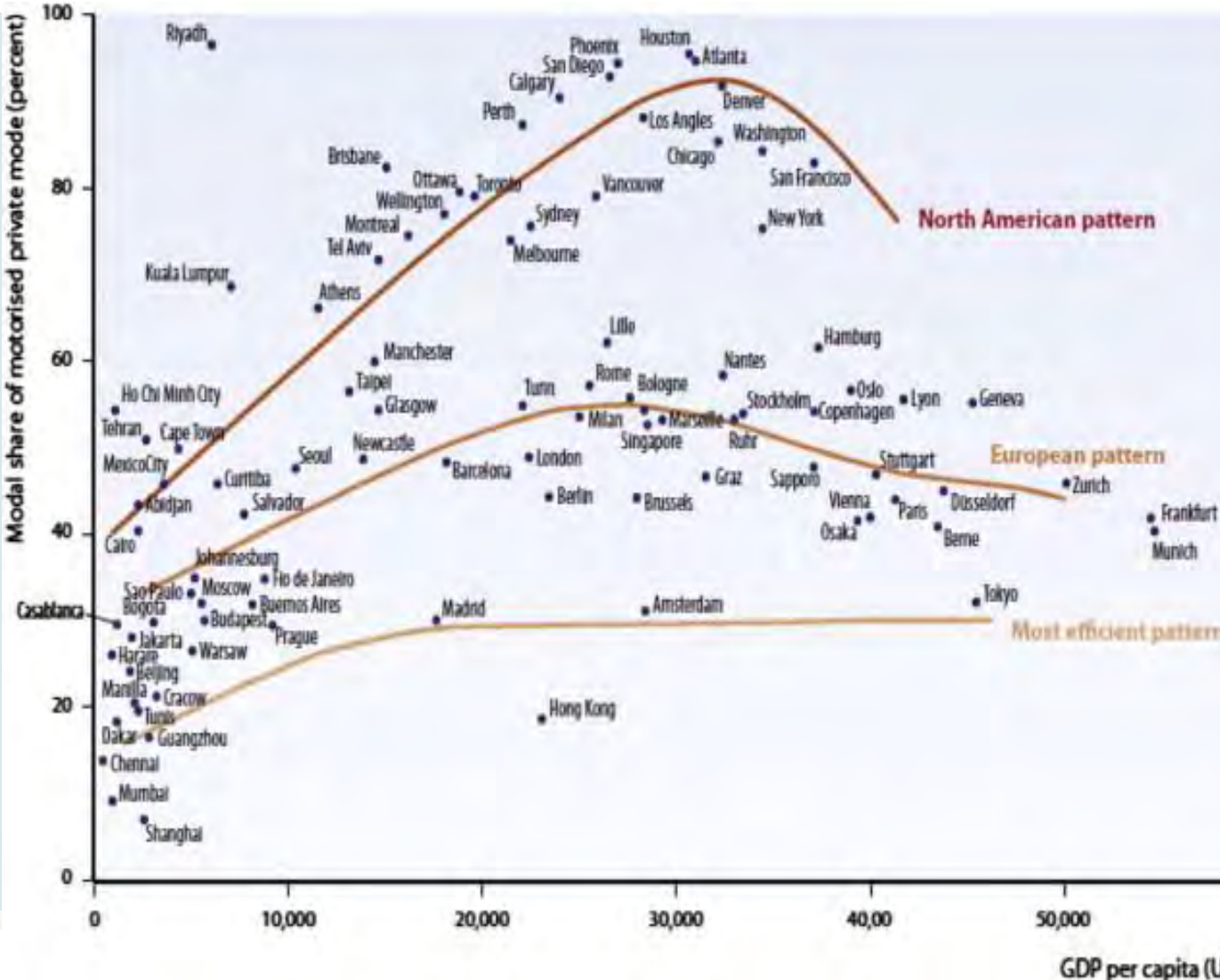
Relationship between GDP per Capita and Individual Motorized Modal Share

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!



Thanks!

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