

World bank Transport forum 2007 Safe, clean and affordable transport



Planning and acting for sustainable mobility in
the cities

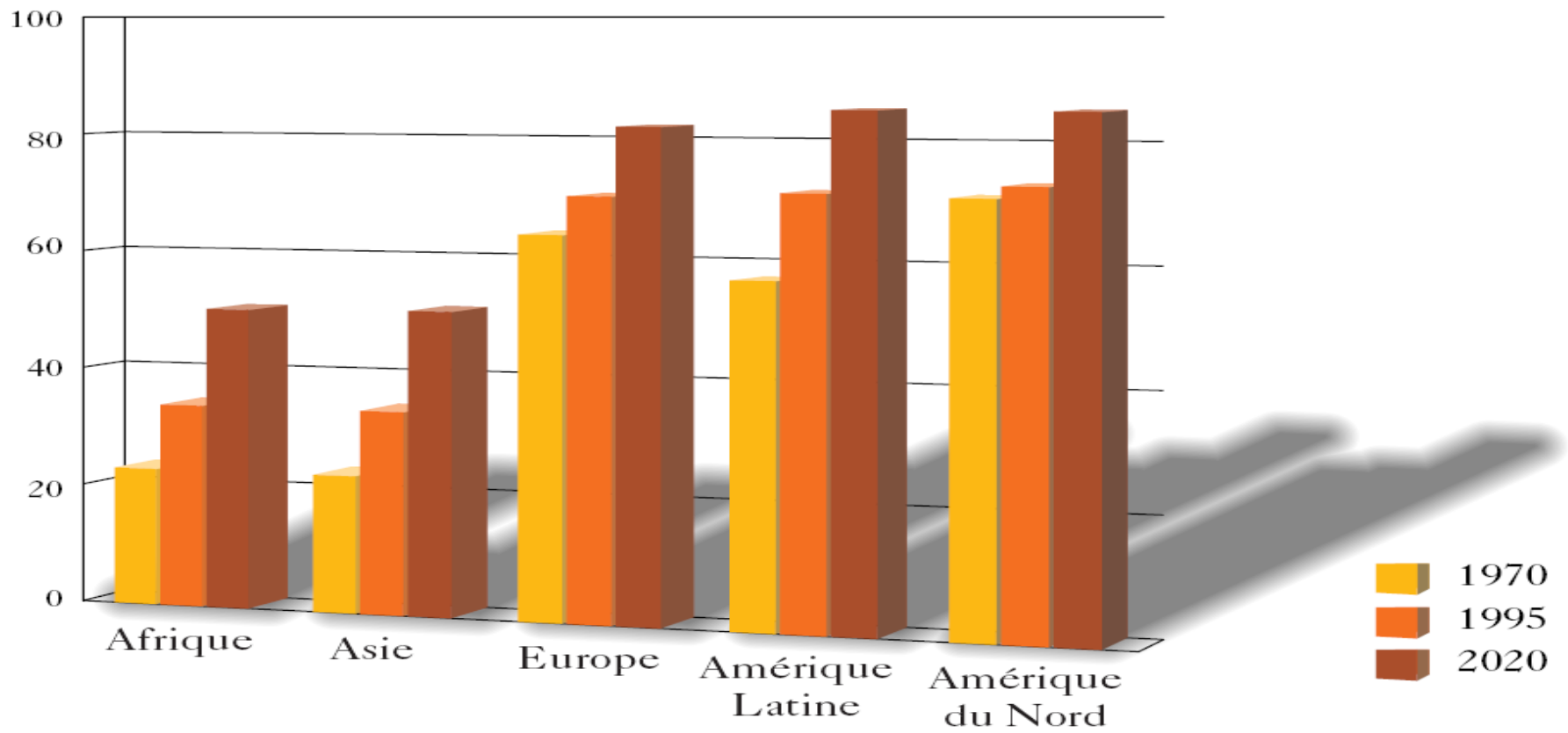
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Weight of the cities

Pourcentage de la population urbaine 1970, 1995, 2020

source : "World urbanization prospects - The 1994 revision", ONU, 1995





Size of the cities

- According UNO, in 2015, in developing countries :
 - 23/27 cities over 10 millions inhabitants
 - 36/44 cities over 5 millions inhabitants
- With this size of the cities, mobility is very crucial.
- Example of Bangkok: from 1972 to 1992: average length of trips increase from 2,5 to 6 km.

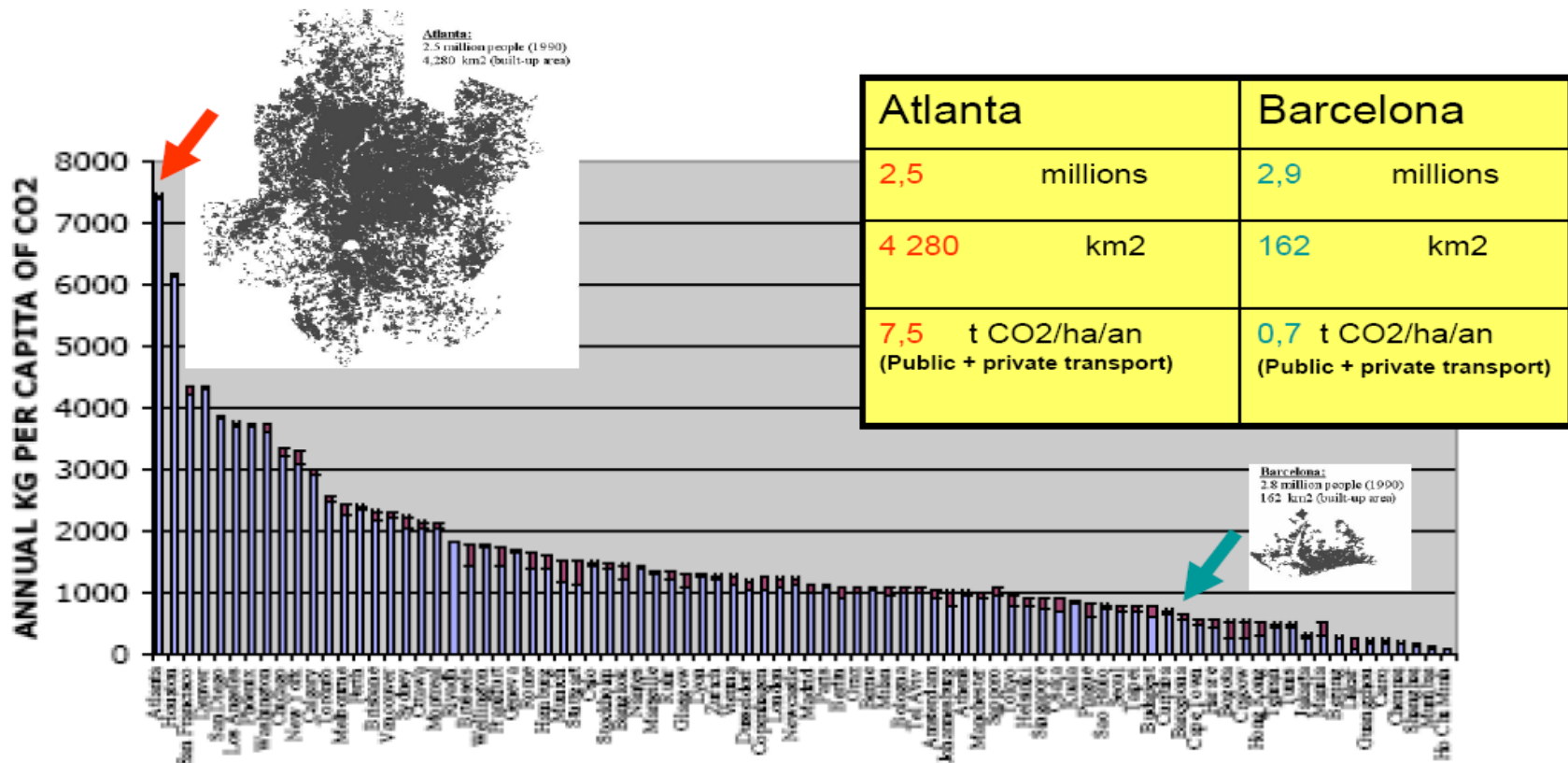


Size of cities and GDP

- GDP increase with the size of the cities
 - Sao Paulo GDP per capita (1990): 4694 \$
= 1.7 Brasil GDP per capita (2797 \$)
 - Calcutta GDP per capita (1190): 953 \$
= 3 India GDP per capita (299 \$)
- Development increases the part of population living in the cities and, so on, mobility problems

Transport and environment

Green house emissions





Transport and energy

	Density	Walk, cycle, PT	Energy
	Inhabitants/ha		Mjoule/inhabitant
USA Canada	18.5	14%	51500
European Union	55	50%	16500
Asia (rich cities)	134	62%	11000
Asia (other cities)	190	68%	6000
Africa	102	67%	6500
South America	90	64%	11500

Source: IUTP



Pollution (1)

- The level of pollution in Mexico in 1991 was the same than in Paris in 1965
- Pollution is due to industry but also, and more and more, to traffic.
- In African cities, the development of motorbikes-taxis, cheaper than car-taxis, increase hardly pollution



Pollution (2)

Transport mode	Trips	Pollution
	%	%
LRT	0.2	<1
Bus	8.4	1
Metro	13.2	<1
Microbus	47.8	19.5
Taxi	14.7	14.7
Private car	20.3	64.8
Total	100	100

Source: Mexico DDF

Pollution (3):

The situation in France about buses

Total rolling stock in France (2006) including metros and light rail: 17350 cars, of which 15775 buses:

Energy	Rolling stock	%
Diesel + Filter	5314	34
Diesel + Diester + Filter	732	4
Diesel + emulsion	678	4
Natural Gaz Vehicle	1542	10
Petrol Liquid Gaz	137	1
Electrical (battery and trolley)	211	1
Hybrids	43	0,3
Total « clean bus »	8657	55
Total Bus fleet in France	15775	100

Source: UTP 2006

Pollution (4) and Green House: The situation in France about buses

- 82% of the rolling stock belong to the transport authorities. For a long time, the transports authorities want to be exemplary and buy each year new bus more efficiency, testing different drawplates, according to the Euro norms...
- 62 % is conformable with Euro norms 2 or 3.

Norms fixed by UE	Euro 0 1988-92	Euro 1 1993-96	Euro 2 1996-01	Euro 3 2000	Euro 4 2006	Euro 5 2009
Oxydes d'azote (NOx)	14,4	8	7	5	3,5	2
Monoxyde de carbone (CO)	11,2	4,5	4	2,1	1,5	1,5
Hydrocarbures	2,4	1,1	1,1	0,66	0,46	0,25
Particules (dusts)	-	0,36	0,15	0,1	0,02	0,02



Safety

- In developing countries, the number of accidents and killed people increase very quickly with the traffic.
- Death rate:
 - Cities of South America: 150 to 300 deaths for 100 000 cars
 - Cities of developed countries: 15 for 100 000 cars.



Transport and equity

- Poor people leave generally on the outskirts of the cities. So, they have long trips to have access to employment, school, public facilities
- In Africa, month public transport ticket represents about 25 % salary. So, trips by foot (concerning mainly the poorest) increase : about 50 % in Bamako or Ouagadougou
- Public transport with affordable fee allows access to all the opportunities of the cities



Transport and efficiency

- Sustainable development of the cities depends of :
 - Accessibility for freight and persons, in affordable time
 - Quality of life : pollution, noise, ...
- Public transport increase the efficiency of the cities : in the same space, more people can move, with less pollution and noise than by car



Sustainable mobility plans (1)

What is that ?

- Global policy of transport, with push measures to develop use of public transport and bicycle, and pull measures to control the use of cars
- Very important link with land-use



Sustainable mobility plans (2)

Key element for the success of the plan:
involvement of responsible of all sectors
concerned by mobility:

- Road maintenance
- Traffic and parking
- Public transport, including representatives of informal transport
- Police

And also responsible for housing.

Sustainable mobility plans (3)

Involvement of stakeholders

- Mobility plan has to answer the inhabitants needs.
- The involvement of inhabitants (workers, women, ...) very useful to:
 - Define cheap and adapted measures
 - Increase public awareness of effects of the mobility choices on environment and health

Sustainable mobility plans (4)

Push measures

- Developing public transport
- Developing intermodality
- Sharing the road space:
 - Sidewalk and areas for pedestrians
 - Lanes for bicycles and buses
 - Right of way for BRT and LRT
- Priority for buses, BRT and LRT at traffic lights

Sustainable mobility plans (5)

Pull measures

- Parking control and restriction
- Taxation of the use of cars: petrol tax, road pricing



Link with land-use

- Low density = mobility by car
- High density = public transport, cycling, walking
- Hospitals, universities, commercial centers, ... have to be developed in central areas and not outside the dense city



Example of Curitiba (1)

- Curitiba, Brasil (state Parana)
- City inhabitants: 1 800 000
- City area : 435 km²
- City density : 4150 inhabitants /km²
- Urban area inhabitants: 2 700 000



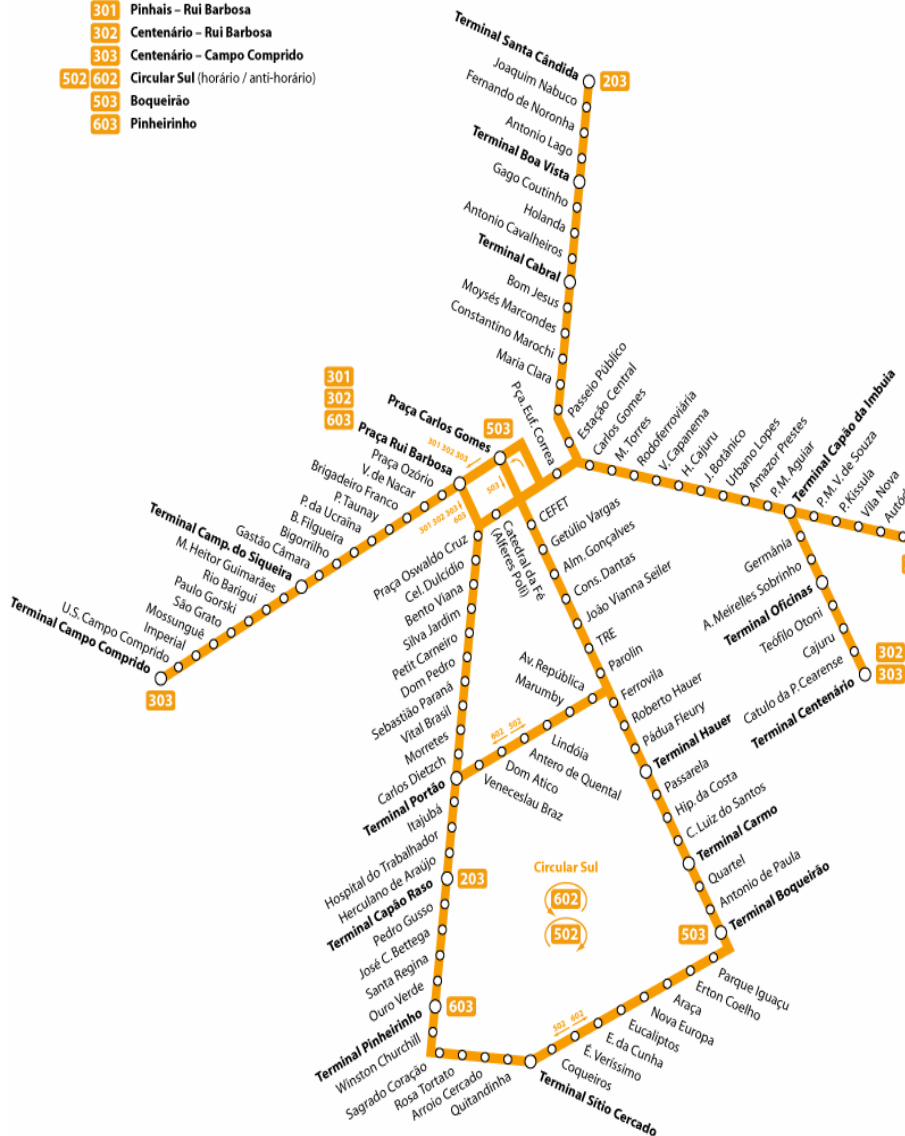
Example of Curitiba (2)

- Master plan (1966)
 - Stops the sprawl development
 - Organizes development along 5 main axes
 - Includes public PT network
- On the main axes:
 - 2 lanes for BRT
 - Skyscraper allowed along these axes
 - Density decrease with distance from these axes

Curitiba

Linhas Expresso Biarticulado

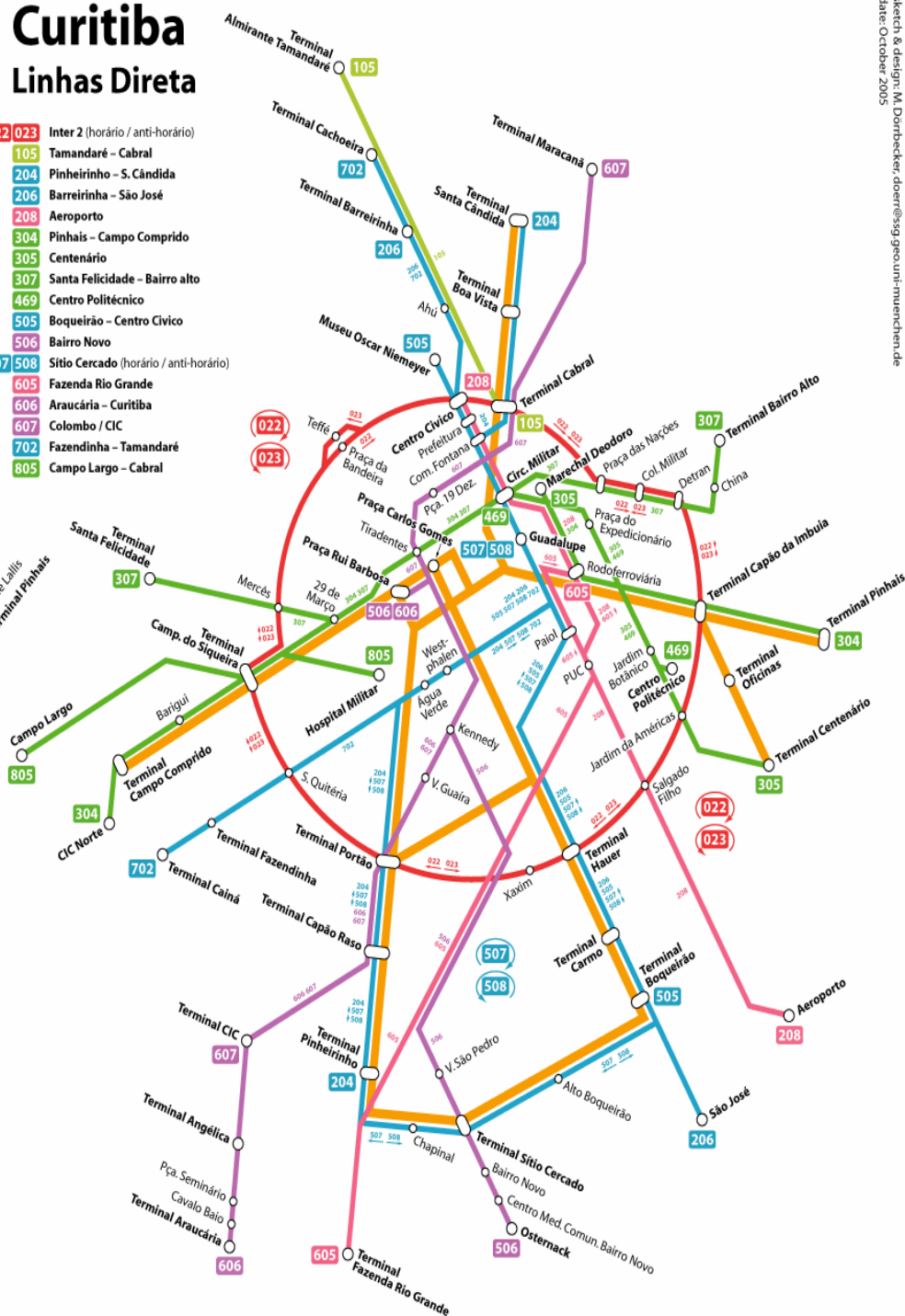
- 203 Santa Cândida – Capão Raso
- 301 Pinhais – Rui Barbosa
- 302 Centenário – Rui Barbosa
- 303 Centenário – Campo Comprido
- 502 602 Circular Sul (horário / anti-horário)
- 503 Boqueirão
- 603 Pinheirinho



Curitiba

Linhas Direta

- 022 023 Inter 2 (horário / anti-horário)
- 105 Tamarandé – Cabral
- 204 Pinheirinho – S. Cândida
- 206 Barreirinha – São José
- 208 Aeroporto
- 304 Pinhais – Campo Comprido
- 305 Centenário
- 307 Santa Felicidade – Bairro alto
- 469 Centro Politécnico
- 505 Boqueirão – Centro Cívico
- 506 Bairro Novo
- 507 508 Sítio Cercado (horário / anti-horário)
- 605 Fazenda Rio Grande
- 606 Araucária – Curitiba
- 607 Colombo / CIC
- 702 Fazendinha – Tamarandé
- 805 Campo Largo – Cabral





Example of Curitiba (3)

- Public transport network:
 - 340 lines, 221 stations (25 for interchange)
 - 60 km lanes right of way for 1900 buses
 - Network hierarchy: express lines, main lines, local lines
- Public transport use:
 - 85 % trips made by public transport
 - Rate of satisfaction : 89 %

Developing use of public transport in developing countries (1)

- Affordable transport for all:
 - Supply (metro, LRT, BRT, buses, minibuses, ...) linked with population needs
 - Fee linked with population revenue

Developing use of public transport in developing countries (2)

- High quality of service for those able to pay
 - Public transport has to compete with private car
 - « First class » public transport (seats for all, door to door, ... and high fee) very useful to develop use



The role of Local Governments

- Mobility, land-use planning, housing are key issues
- Involvement of stakeholders essential for success
- Choices and decision: level closed the citizens



Thank you for your attention

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