## Sustainable Urban Mobility in Asian Cities

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# Comparison between the key characteristics of megacities in developed western countries and developing Asia

Issues	Developed (USA/European)	Developing (Asia)
1. Macro context		
Economic growth, urbanization	Modest and gradual	Rapid
Time span for infra accumulation	Longer	Shorter
Emergence of demand	Gradual/sequential	Simultaneous
State of overall system	Almost stabilized	Evolving
Overall transport demand	Stabilized or small growth	Rapidly growing
2. Transport and spatial development		
Regional disparity	Low or modest	Higher
City-sized distribution	Balanced	Primacy
Megacity urban structure	Decentralized	Monocentric
Land use	Zoning	Mixed use
Urbanized density	Lower	Higher
Stage of urban structure	Stabilized	Evolving
Land-use regulation	Strong	Weak

## Vital statistics of selected Asian megacities

	Land area	(sq. km)	Population in 2010 (thousand)		GPR per capita (US\$)	GDP per capita (US\$)
Metropolitan	Metro	Core	Metro	Core	For core city	National
Shanghai	6,341	822	19,213	10,720	10,828	3,7400
Taipei	2,457	376	6,753	2,620	45,176	16,423
Jakarta	13,601	664	24,100	10,100	8,186	2,349
Tokyo	6,467	621	31,036	8,653	66,500	39,738
Metro Manila	4,863	639	21,420	13,503	5,323	1,796
Seoul	11,771	605	22,130	10,581	25,650	21,870
Bangkok	7,762	1,569	11,970	9,100	10,977	3,893
Ho Chi Minh	2,095	494	7,163	5,881	2,800	1,032

Source: Transport Development in Asia Megacities, 2013 (TDAM 2013)

## Level of urbanization and urban growth rates

	Urba	n popula millions	ition	Percentage urban %		Annual rate of change of the urban population %		Rate of urbanization <sup>a</sup> %		
Major area	1985	2010	2025	1985	2010	2025	1985- 2010	2010- 2025	1985- 2010	2010- 2025
World	1,976	3,486	4,536	40.8	50.5	56.6	2.2	1.0	0.82	0.44
Africa	167	413	661	30.0	40.0	47.2	3.5	1.8	1.10	0.64
Asia	836	1,757	2,383	28.9	42.2	49.9	2.9	1.2	1.45	0.65
Europe	485	533	561	68.6	72.7	77.0	0.4	0.2	0.22	0.22
L. America and the Caribbean	271	469	561	67.4	79+.6	83.7	2.1	0.7	0.64	0.19
North America	199	289	340	74.5	82.1	85.4	1.4	0.6	0.37	0.15
Oceania	18	25	30	72.0	69.4	69.8	1.3	0.7	-0.14	0.02

#### source: TDAM 2013

<sup>a</sup> Rate of urbanization is the annual rate of change in percentage urban

#### **City Size Distribution**



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#### Urban form of Asian megacities: (a) Seoul, (b) Tokyo, (c) Jabotabek, (d) Metro Manila, (e) Shanghai, (f) Bangkok



# Comparison between the key characteristics of megacities in developed western countries and developing Asia (cont.)

Issues	Developed (USA/European)	Developing (Asia)
3. Urban roads and motorization		
Road infrastructure	Adequate for basic mobility	Inadequate
Level of car ownership	Near saturation	Growing
Level of road congestion	Moderate	Severe
Principal cause of congestion	High use of private modes	Lack of roads
Motorcycle use	Low	High
Car-use motivation	Needs and convenience	Needs and status
4. Public transport (PT)		
Target users	Marginal users (low income, elderly)	Mainstream users
Urban rail development	Before motorization	After/during motorization
Public transport: mode share	Lower	Higher
Financial viability of PT	Lower (needs subsidy)	Higher (making profit)
Subsidy need for urban rail	Capital + operation	Capital only
City structure	Unfavorable for PT	Favorable for PT
Organization for public transport	Public sector	Public-private

#### **Challenges:** Based on the 1<sup>st</sup> Global Driver Satisfaction Index developed by Waze, Metro Manila has "The worst traffic on earth"



Northbound motorists coming from Pasig and Makati, and southbound traffic got caught in the traffic jams on Katipunan Avenue as a result of MMDA's daft traffic scheme that funneled volumes from 5 to 2-lane slots..

### Economic cost of congestion



Congestion costs estimated based on productive time loss and fuel costs

## Car ownership trend (1980-2009)



### Road area ratio in selected cities

		Administrative		Road area
City/area <sup>a</sup>	Data year	area (km²)	km²	% of administrative area
City of London	2005	3.2	0.8	25.0
Inner London	2005	310.0	56.6	18.3
Greater London	2005	1,595.0	196.0	12.3
New York City	2010	789.0	165.9 <sup>b</sup>	21.0
Inner New York	2010	59.0	15.2	25.7
City of Paris	1999	105.0	27.0	25.7
Tokyo 23	2010	622.0	101.2	16.3
Inner Tokyo	2010	75.0	16.2	21.6
Seoul City	2009	605.0	82.3	13.6
Taipei City	2007	272.0	20.9	7.7
Inner Shanghai	2008	108.0	13.0	12.0
Jakarta City	2007	656.0	48.0	7.3
Inner Bangkok	2006	225.0	16.0	7.1

Data source: Data for the administrative areas and road areas are from official published sources, such as statistical year book or city land-use statistics

<sup>a</sup> Inner London includes 12 inner boroughs and city of London. Inner New York is Manhattan Borough. Inner Tokyo includes five wards in central Tokyo (Chiyoda, Chuo, Minato, Shinjuku, and Shibuya)

b Also includes river area



#### Trends in public transport share (Source: TDAM 2013)



### Asian MRT<sup>a</sup> and their daily ridership 2010

City	Opening year	Length, 2010 (km)	Daily passengers ('000)	Car ownership No./1,000 population	Remarks	Urbanized density <sup>b</sup> (persons per ha)	Population (greater MA), million
Seoul	1974	287	5,610	229	Rapid expansion, rethinking for alternative modes, BRT	230	24.5
Metro Manila	1984	52	948	50 <sup>b</sup>	No expansion due to financial constraint, low capacity	206	21.4
Shanghai	1995	423	3,560	95	Rapid expansion, 400 km by 2010 (using leasing fee)	196	19.2
Таіреі	1996	101	1,270	244	Rapid expansion, 118 by 2010	220	6.7
Bangkok	1999	75	564	227 <sup>b</sup>	Uncertain expansion plan	138	11.9

#### Source: Compilation from city case studies

<sup>a</sup> Include only heavy rail system except the urban section of national rail (except Metro Manila which is the LRT system <sup>b</sup> 2004 data

## BRT system in selected Asian and other cities

City/company	Year constructed/ operated	System capacity (pass/h/direction)	Speed (km/h)
East Asian cities			
Beijing	2004	7,500	21
Kunming	2003	8,000	19
Jakarta/TransJakarta (first corridor)	2004	5,000	21
Seoul	2004	12,500	17
Bangkok	2010	10,000	14
Other cities (Latin America)			
Lima	1972	15,000	21
Sao Paulo 9 de julho	1975	15,000	16
Porto Alegre Assis Brasil	1977	28,000	15
Curitiba/Exio Sul	1974	13,000	22
Bogota/TransMilenio	2000	35,000	25

Source: BRT in China and Asia, ITDP; http://www.chinabrt.org/faulten.aspx

# Comparison between the key characteristics of megacities in developed western countries and developing Asia (cont.)

Issues	Developed (USA/European)	Developing (Asia)
5. Institutions and financing		
Institution/governance	Well developed	Less developed
Capacity of city government	Higher	Lower
Funding/financing sources	Diverse	Government revenue
Property taxes	Higher	Very low
Fuel and vehicle taxes	High/earmarked	Low/general revenue
Area of funding need	Operation and maintenance	New infra, O&M
Value capture	Utilized (diverse methods)	Not utilized

### **Policy Options**

#### **1. Transport and Spatial Development**

- Urban growth management
- Adopt multi-center urban forms

### 2. Urban Roads and Motorization

- Expand road network
- Control motorization
- Promote non-motorized transport

## Policy Options (2)

#### 3. Public Transport

- Take advantage of public transport hierarchy
- Expand mass transit system
- Give priority to public transport
- 4. Institutions and Financing
- Establish suitable transport organizations
- Strengthen transport institutions
- Initiate regulatory reforms
- Promote PSP





ERP Gantry in Singapore



### **THANK YOU**

#### MAIN REFERENCES:

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