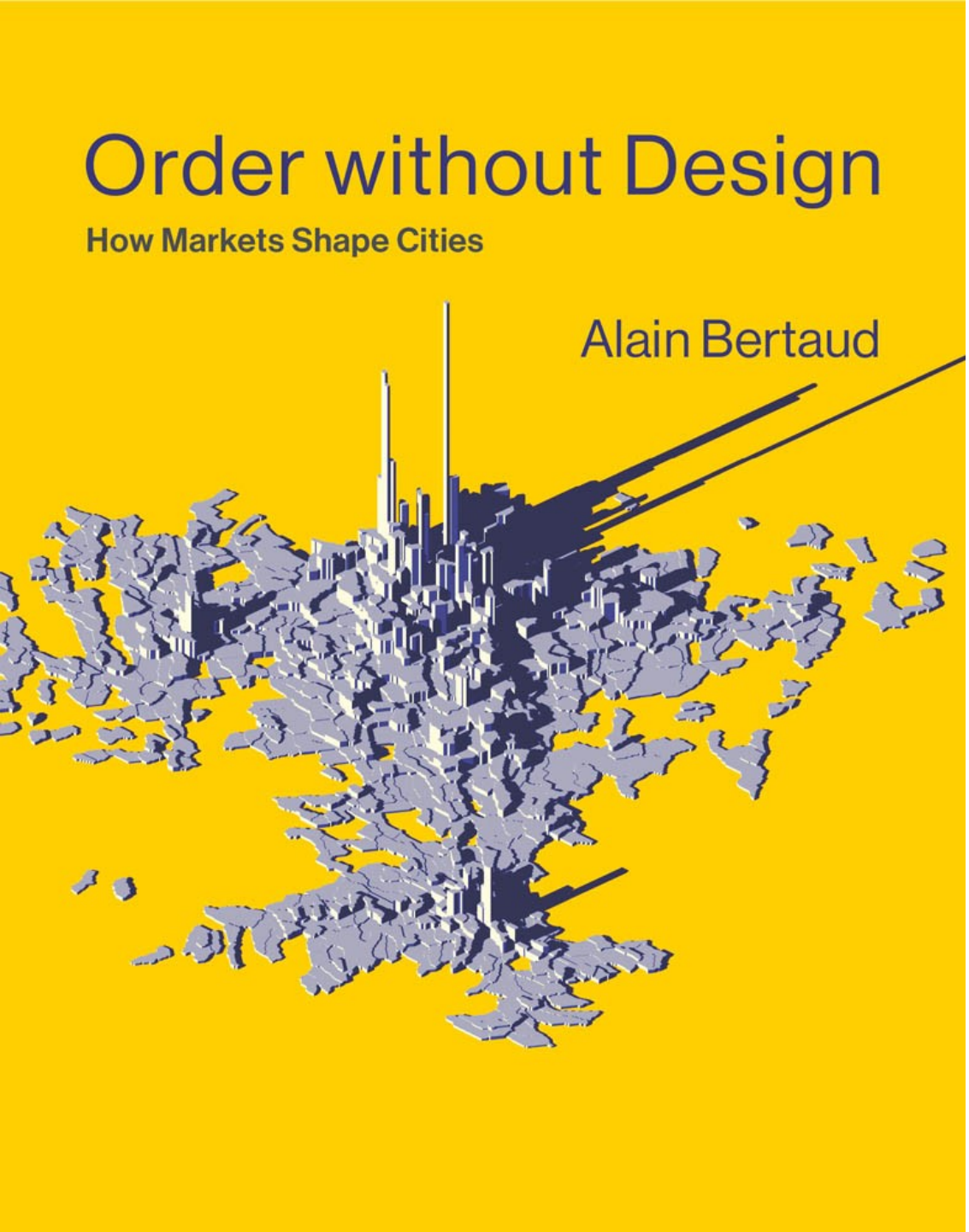


Centre for Urban Research and Land Development

Ryerson University
Toronto 30-Sept-2019

Alain Bertaud

abertaud@stern.nyu.edu

http://alainbertaud.com

https://mitpress.mit.edu/contributors/alain-bertaud

Quotations

- "There is no knowledge without measurement"

Leonardo da Pisa also known as Fibonacci (c. 1170 – c. 1250)

- "Every step and every movement of the multitude, even in what are termed enlightened ages, are made with equal blindness to the future; and nations stumble upon establishments, which are indeed the result of human action, but not the execution of any human design"

Adam Ferguson(1782)

- "Order generated without design can far outstrip plans men consciously contrive"

F Hayek. The Fatal Conceit (1988)

Cities are generated by the interaction between bottom-up markets (land use) and top-down design (infrastructure)

Top down design must serve the spontaneous order generated by markets, not the other way around

Infrastructure must adjust to densities generated by markets

Outline

1. Planners Vs Economists
   Design Vs Markets
2. Cities are primarily labor markets
3. Mobility
4. Housing Affordability
5. The future of cities

1. Planners Vs Economists Design Vs Markets

Planners and Economists

Urban planners are “normative”

- They like to advocate “compact cities” implying that there is an optimal population density
- They advocate cities that are “sustainable” , “livable”, “resilient” without defining quantitative indicators that indicate progress in achieving the objective

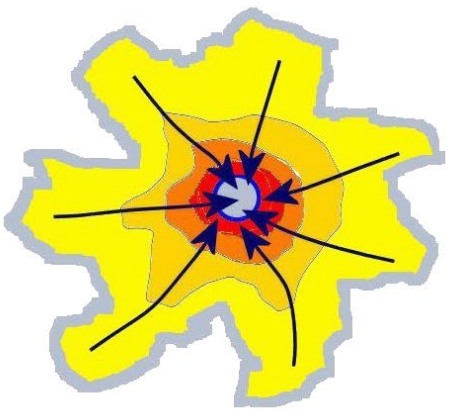
Urban economists use mathematical models to represent real cities

- They study how markets shape cities
- If asked what is the best density, they answer “it all depends”
- They develop mathematical models that simplify reality but are useful in understanding the impact of income, cost of transport, price of agricultural land on city shapes and densities.

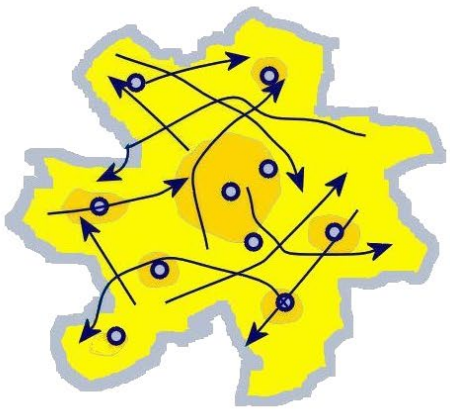
2. Cities are primarily labor markets

The efficiency of large labor markets is the main cause of ever-growing cities

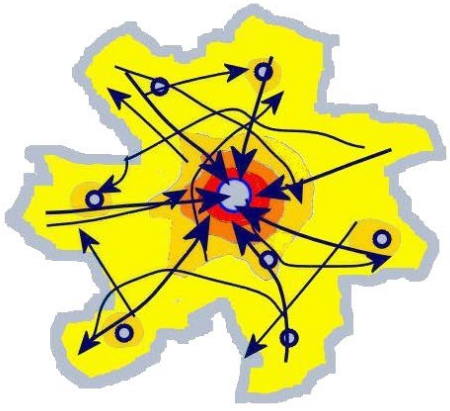
Trip patterns and types of jobs spatial distribution



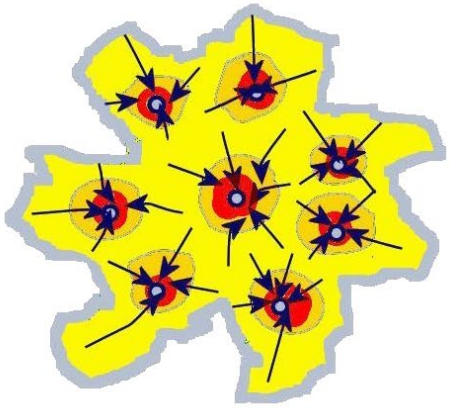
A. The classical monocentric model



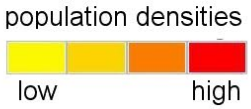
B. The dispersed model



C. The composite Model



D. The "Urban village" model (doesn't exist in real world)



Alternative view: Cities as Club Med new vision for Manhattan streets

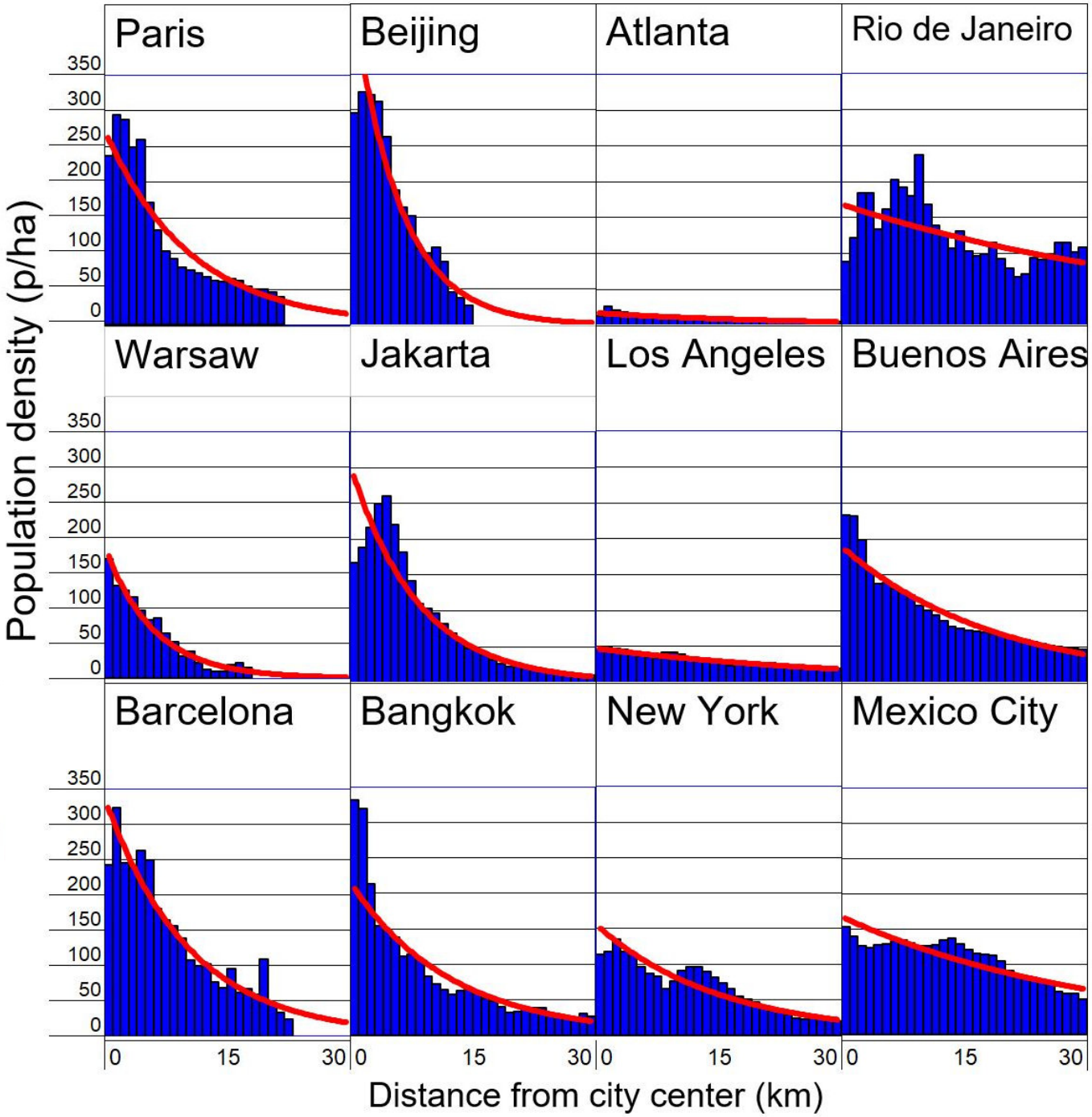
A speculative rendering shows the potential of local streets with enhanced public space and without private automobiles. (Perkins Eastman)

Jonathan Cohn leads the transportation and public infrastructure studio of Perkins Eastman.

Yunyue Chen is the 2017 recipient of Perkins Eastman's Architectural Fellowship for the Public Realm.

Densities are also driven by labor markets

Planners should project future densities but should not regulate them



	City	gradient	R^2
1	Beijing	-0.17	0.92
2	Warsaw	-0.17	0.86
3	Jakarta	-0.12	0.97
4	Barcelona	-0.1	0.89
5	Paris	-0.1	0.90
6	Bangkok	-0.08	0.92
7	New York	-0.07	0.90
8	Buenos Aires	-0.05	0.95
9	Atlanta	-0.04	0.84
10	Mexico City	-0.03	0.81
11	Los Angeles	-0.03	0.91
12	Rio de Janeiro	-0.02	0.37

3. Mobility

Defining mobility

Ability to:

- Commute from one location in a metropolitan area to any other location in less than one hour

- Move firm location or residence with low transaction cost and delays

Measuring mobility is different from measuring congestion

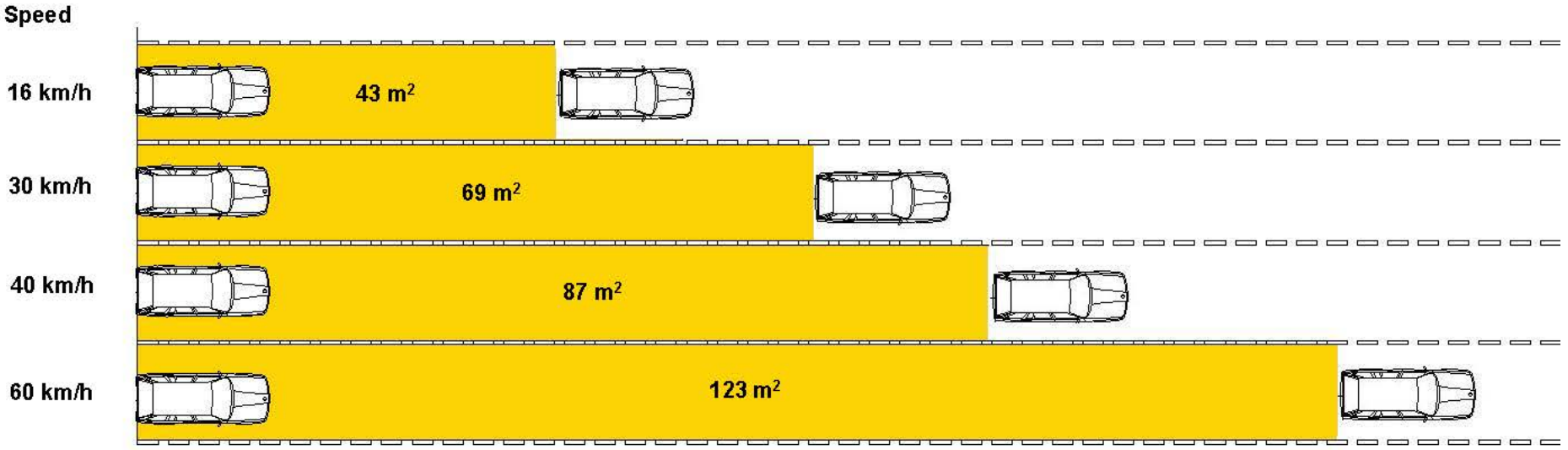
The mobility index of a neighborhood measures the number of jobs accessible within a given commuting time

Mobility should be measured for each transport mode [(1)] :

- **Walking**
- **Cycling**
- **Electric Moped**
- **Cars**
- **Buses**
- **BRT**
- **Metro**

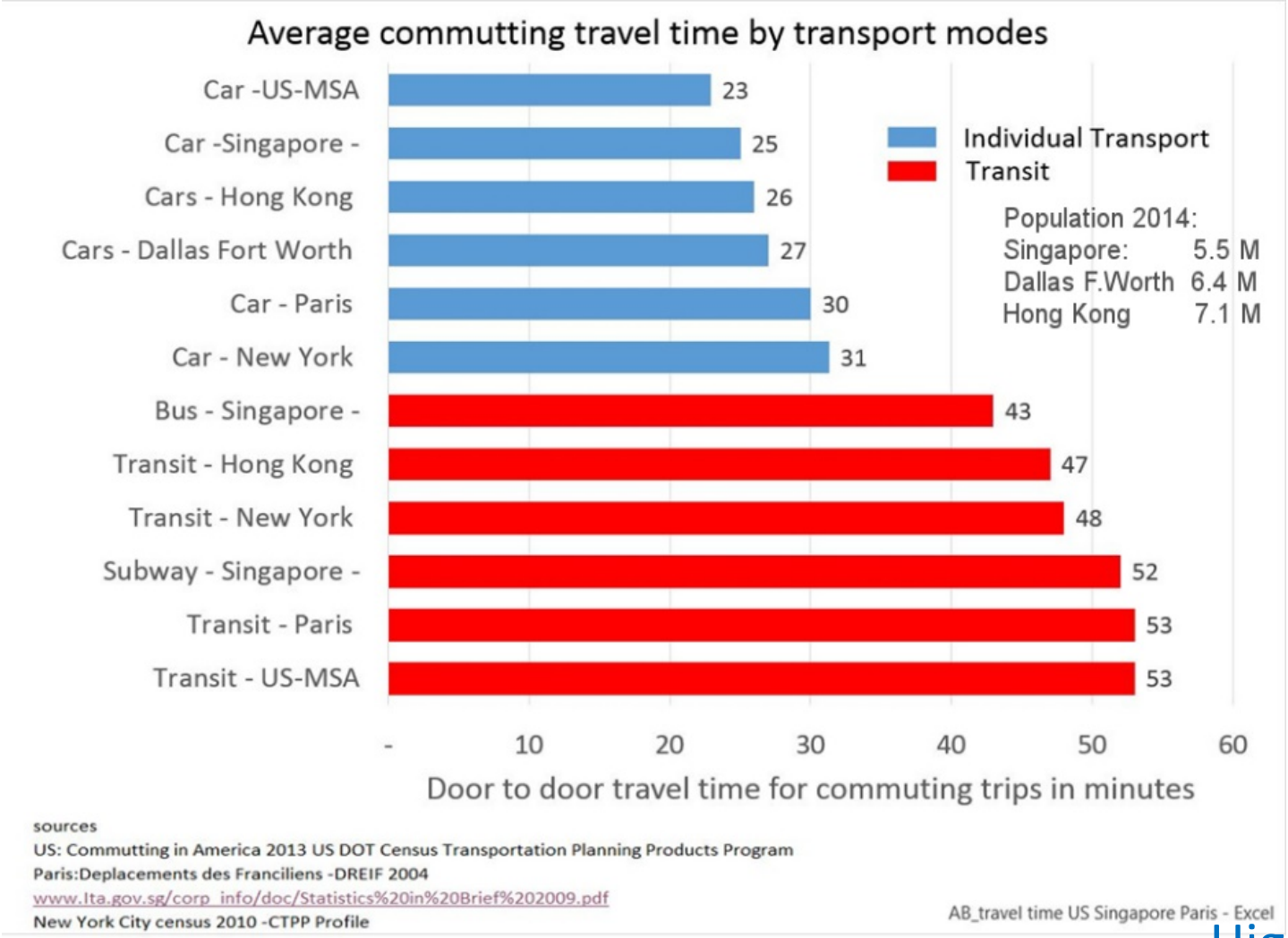
[(1)] So should congestion index, by the way!

Moving cars consume large areas of scarce and valuable urban land.
But their high energy use and pollution emissions could be managed in the future through technology.



Street area required to maintain a safe distance between cars at different speeds aswsuming a 2 seconds drivers reaction time

Our traditional transport modes seems to reach a speed ceiling that may limit the efficiency of larger labor markets
and the elasticity of urban land supply



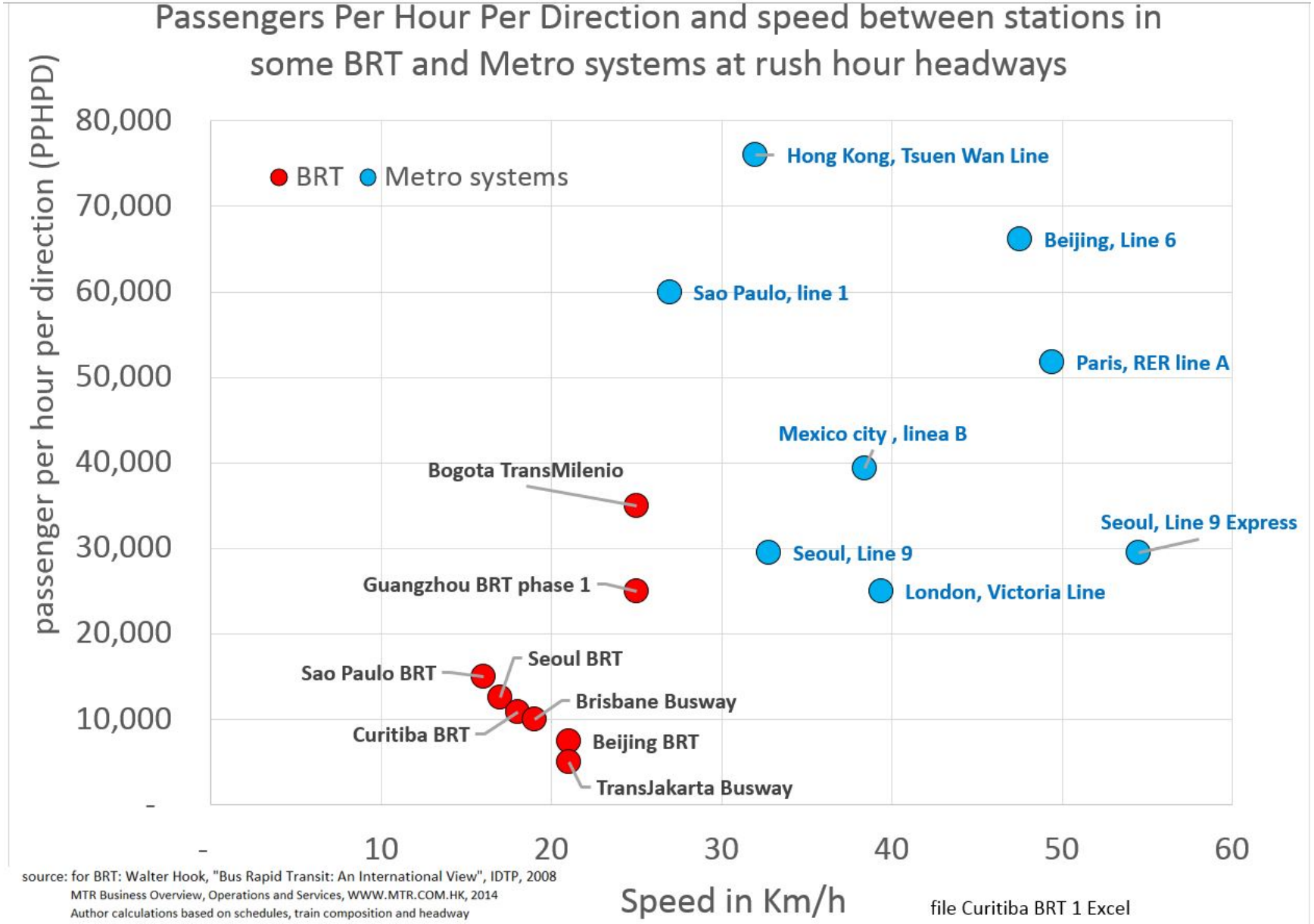
sources
US: Commutting in America 2013 US DOT Census Transportation Planning Products Program
Paris:Deplacements des Franciliens -DREIF 2004
www.lta.gov.sg/corp_info/doc/Statistics%20in%20Brief%202009.pdf
New York City census 2010 -CTPP Profile

AB_travel time US Singapore Paris - Excel

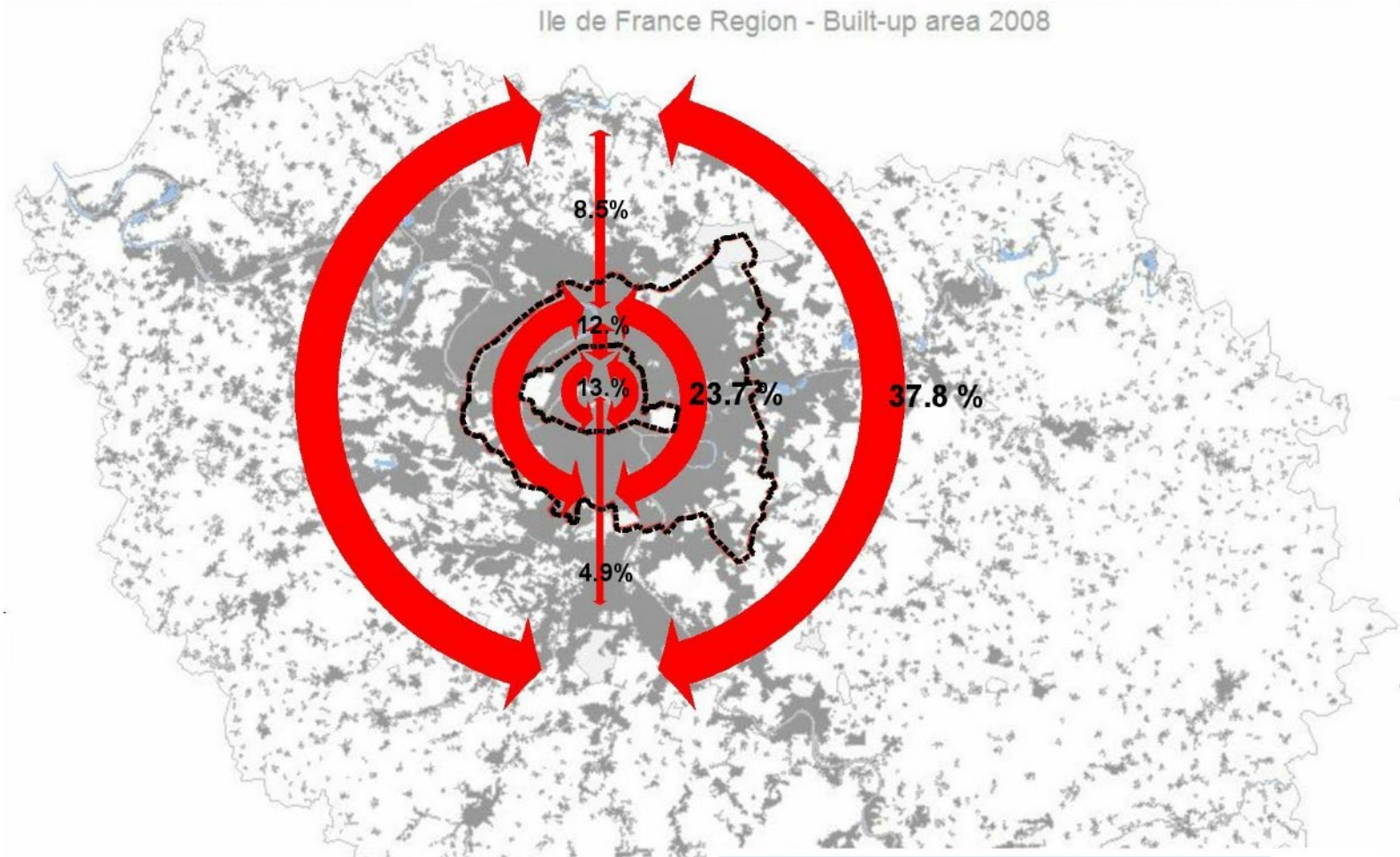
	Population	% transit	Density	Built-up area
	million people	*% of mechanised commuting trips*	*people/ha*	*km2*
Dallas	6.20	2%	12	5,167
New York MSA	20.30	26%	18	11,278
Paris (IDF)	11.80	34%	41	2,878
Singapore	5.60	52%	109	514
Hong Kong	6.80	88%	264	258

High density cities do not have a shorter commuting time,
ceteris paribus

For large metropolitan areas the problem with transit is speed not capacity.



Trip pattern in Paris Metropolitan area

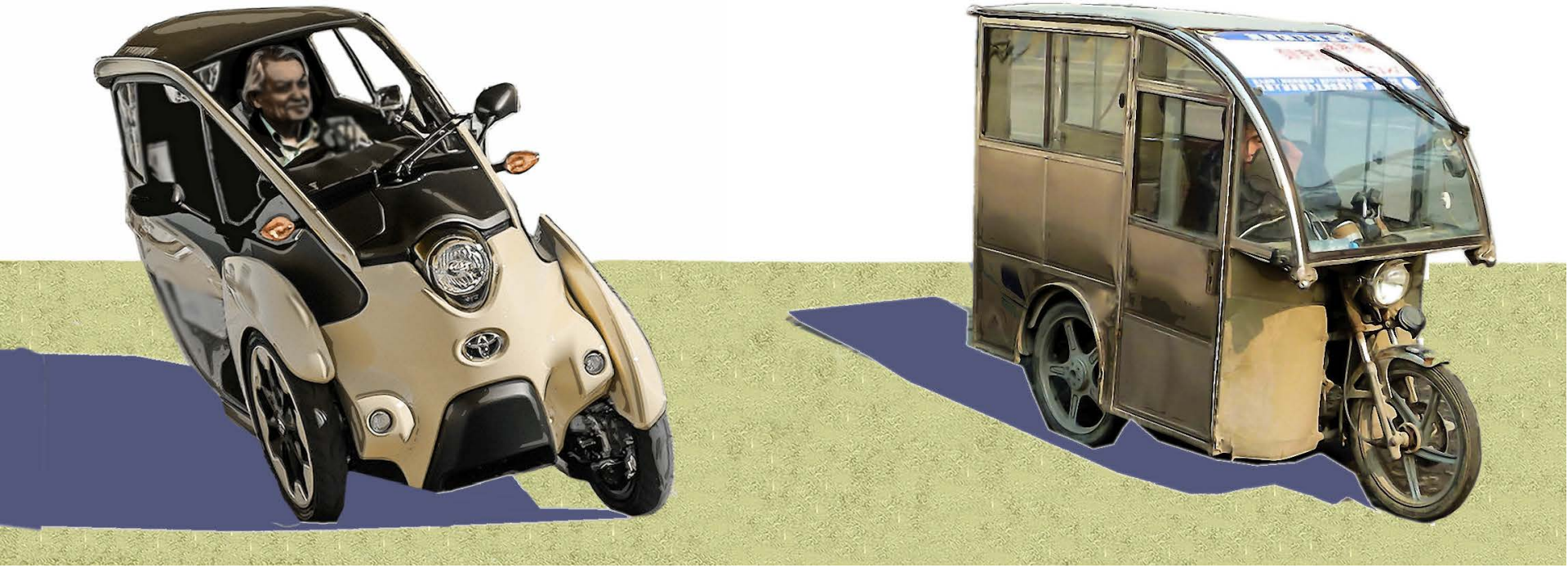


percent of trips in 2001	
From or to Paris municipality:	30%
from suburbs to suburbs	70%

Source: Google Earth Image digitized by Marie-Agnes Bertaud

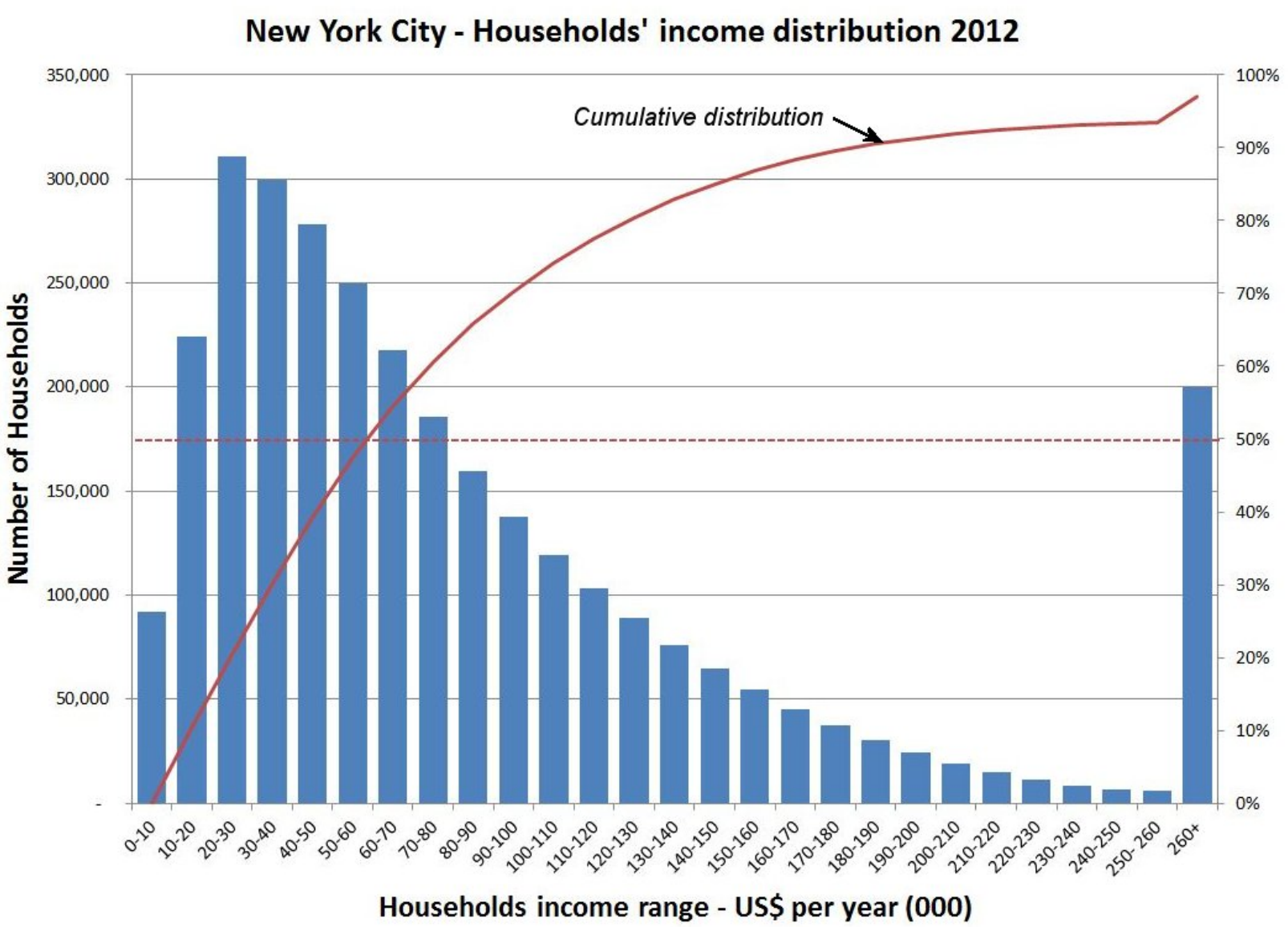
Source transport: Direction Generale de l'equipement de l'Ile de

A component of Urban transport of the future? In large metropolises urban transport will be multimodal



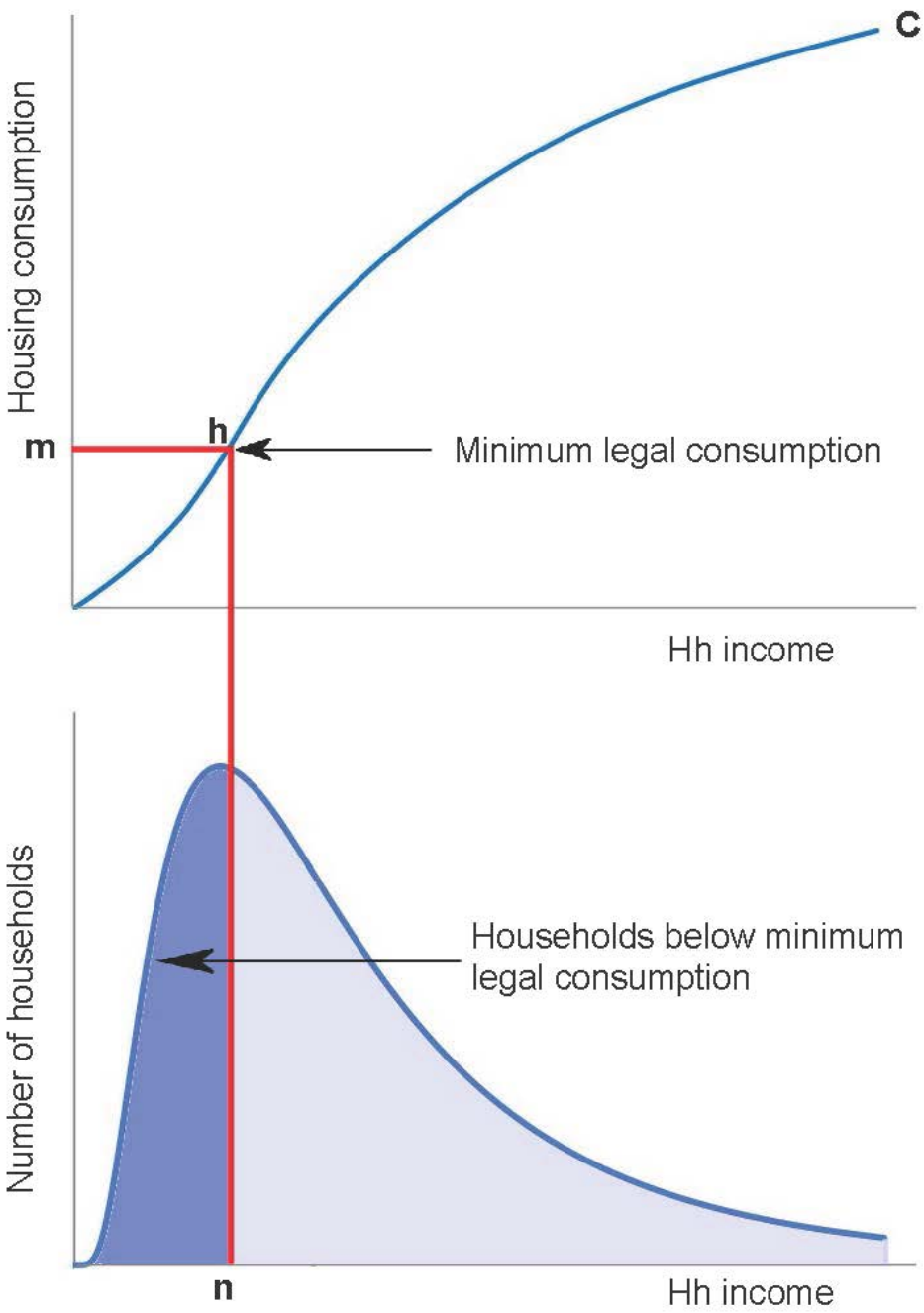
4. Housing Affordability

Housing policy should be driven by the profile of households' income distribution



Source: derived from US Census American Community Survey

Integrated Public Use Microdata Series NYU Furman center



Regulations establishing minimum housing consumption for land and floor space condemn part of population to illegality and increase poverty

Evolution of minimum housing standards in New York

Housing Type	Date	Floor area of Apartment (m^2)	Floor area of smaller room	Assumed number of persons per unit	Floor area per person
		m^2	m^2	people	m^2
A. Tenement	1860	27.5	6.0	6	4.6
B. Old law tenement	1880	26.7	6.0	6	4.4
C. Old law tenement remodeled	2016	26.7	na	2	13.3
D. Studio Minimum size	2016	38.0	na	2	19.0
E. Micro Apartment	2016	27.8	na	1	27.8

Design through regulations

Multiplication of detailed zoning districts in New York paralyzes new construction and prevents innovation

High-Density Non-Contextual Residence District

R10 QH		Lot Area min.	Lot Width min.	Rear Yard min.	Lot Coverage max. Corner	Lot Coverage max. Other Lot	FAR max.	Base Height min.–max.	Building Height max. (w/QGF)	# of Stories max. (w/QGF)	DU Factor	Required Parking min. Basic	Required Parking min. IRHU
Basic	Narrow Street	1,700 sf	18 ft	30 ft	100%	70%	10.00	60-125 ft	185 ft	n/a (21)	680	40% of DU	12% of IRHU
	Wide Street							125-155 ft	200 (215) ft				
Inclusionary	Narrow Street						12.00	60-155 ft	210 (215) ft	21			
	Wide Street							125-155 ft	230 (235) ft	23			

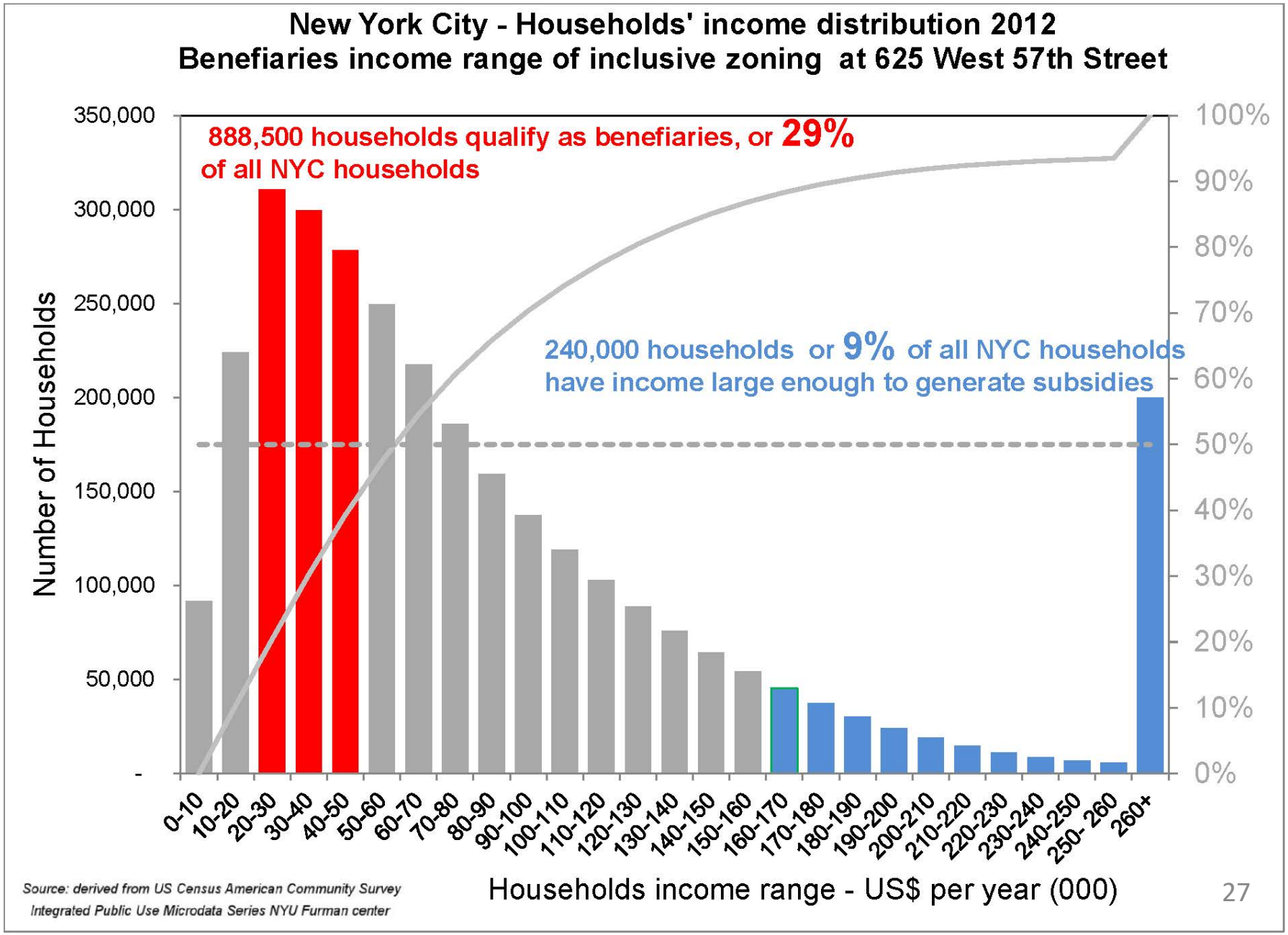
Low-Density Non-Contextual Residence Districts

R1 + R2		Lot Area min.	Lot Width min.	Front Yard min.	Rear Yard min.	Side Yards #	Side Yards min. Each	Side Yards min. Total	Open Space Ratio max.	FAR max.	Sky Exposure Plane max.	DU Factor	Required Parking min.
R1-1	Single-Family Detached	9,500 sf	100 ft	20 ft	30 ft	2	15 ft	35 ft	150.0	0.50	Starts at 25 ft	4,750	1 per DU
R1-2		5,700 sf	60 ft				8 ft	20 ft				2,850	
R2		3,800 sf	40 ft	15 ft			5 ft	13 ft				1,900	

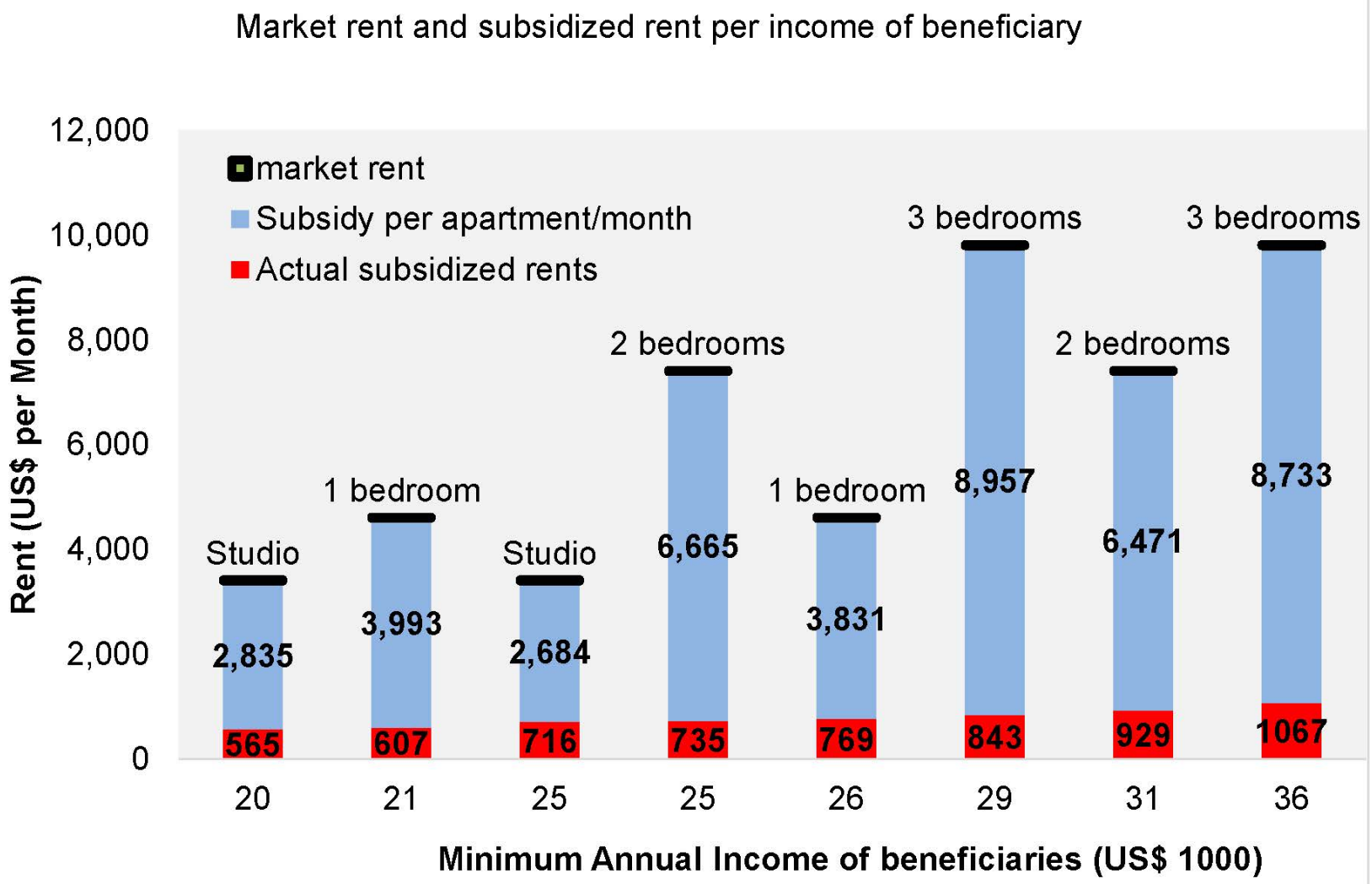
Low-Density Contextual Residence Districts

R1 + R2		Lot Area min.	Lot Width min.	Front Yard min.	Rear Yard min.	Side Yards #	Side Yards min. Each	Side Yards min. Total	Lot Coverage max.	FAR max.	Perimeter Wall/ Building Height max.	DU Factor	Required Parking min.
R1-2A	Single-Family Detached	5,700 sf	60 ft	20 ft	30 ft	2	8 ft	20 ft	30%	0.50	25/35 ft	2,850	1 per DU
R2A		3,800 sf	40 ft	15 ft			5 ft	13 ft			21/35 ft	1,900	
R2X		2,850 sf	30 ft		20 ft		2 ft	10 ft	n/a	0.85		2,900	

The Inclusive zoning illusion



Case study: market and subsidized rents in an inclusionary building in Manhattan (VIA57-2018)



Source : Application form for subsidized apartment at VIA57 and developer advertisement for market rate rental in same building http://www.57and11lottery.com/assets/VIA_Ad_and_ApplicationUpdated-d02a4451c02942f28cc0fb5af0b9b5f4312dab4999438b7c85c4f01a3071151d.pdf

Housing affordability principles

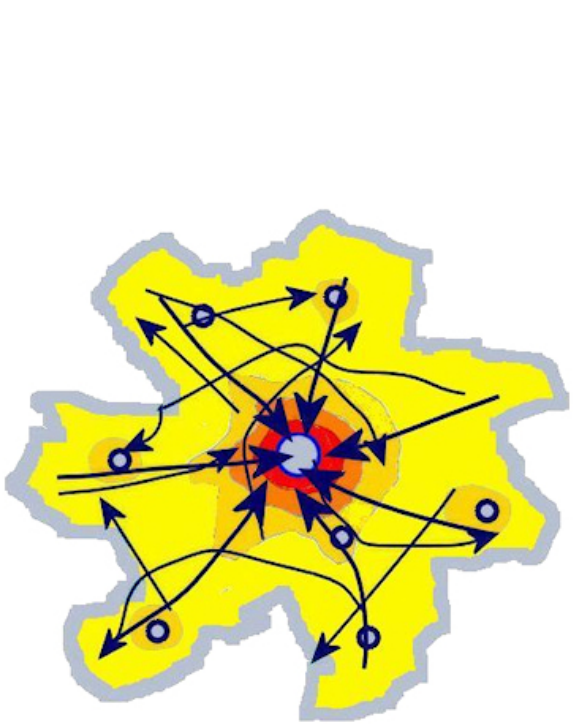
- A small percentage of the population requires subsidized or even free housing on a temporary or permanent basis
- The market should provide housing for the rest of the population
  - Long waiting lists or lotteries are not acceptable solutions
- Increasing housing supply by
  - Removing regulatory barriers on densities, and apartment size
  - Increasing land supply –new infrastructure—faster transport
- Diversifying supply
  - Simplifying building permits procedure and time required
  - Allowing different housing forms to coexist side by side

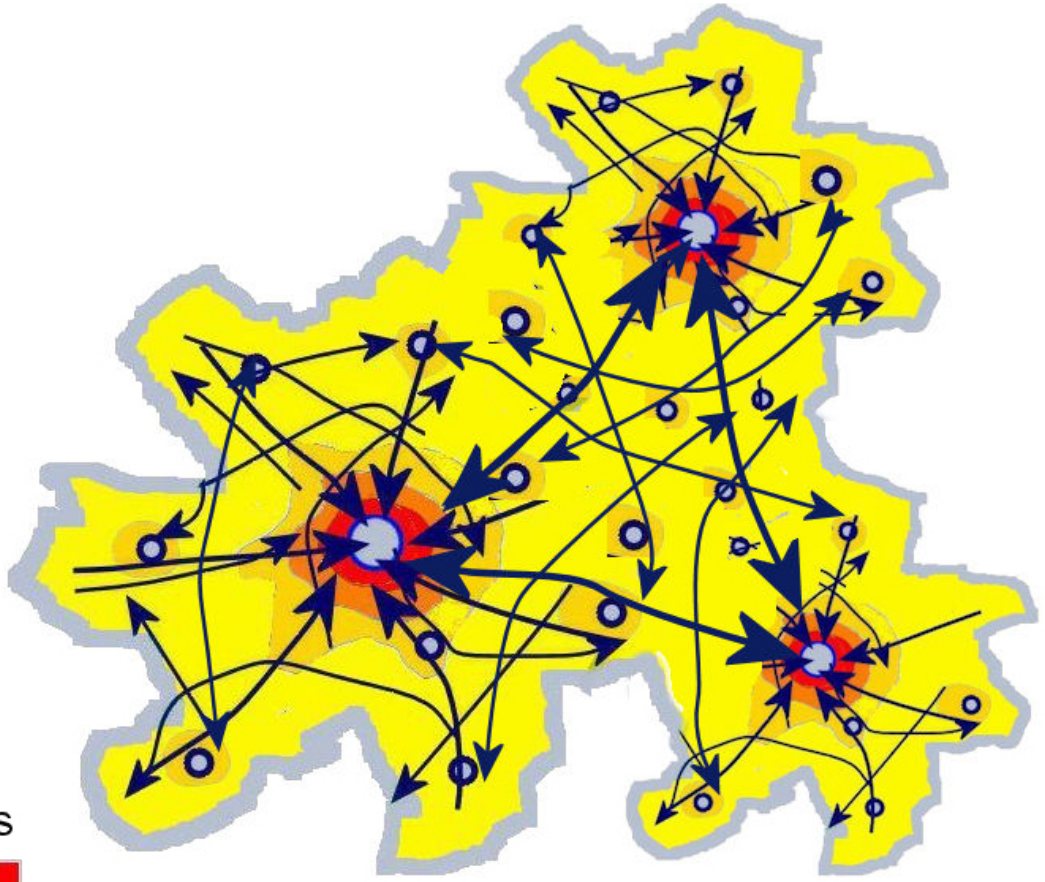
5. The future of cities

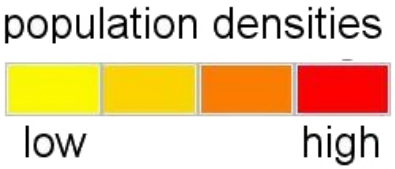
The dispersion of trips origin and destination will increase in China's large urban clusters

Typical trips pattern in a metropolitan area

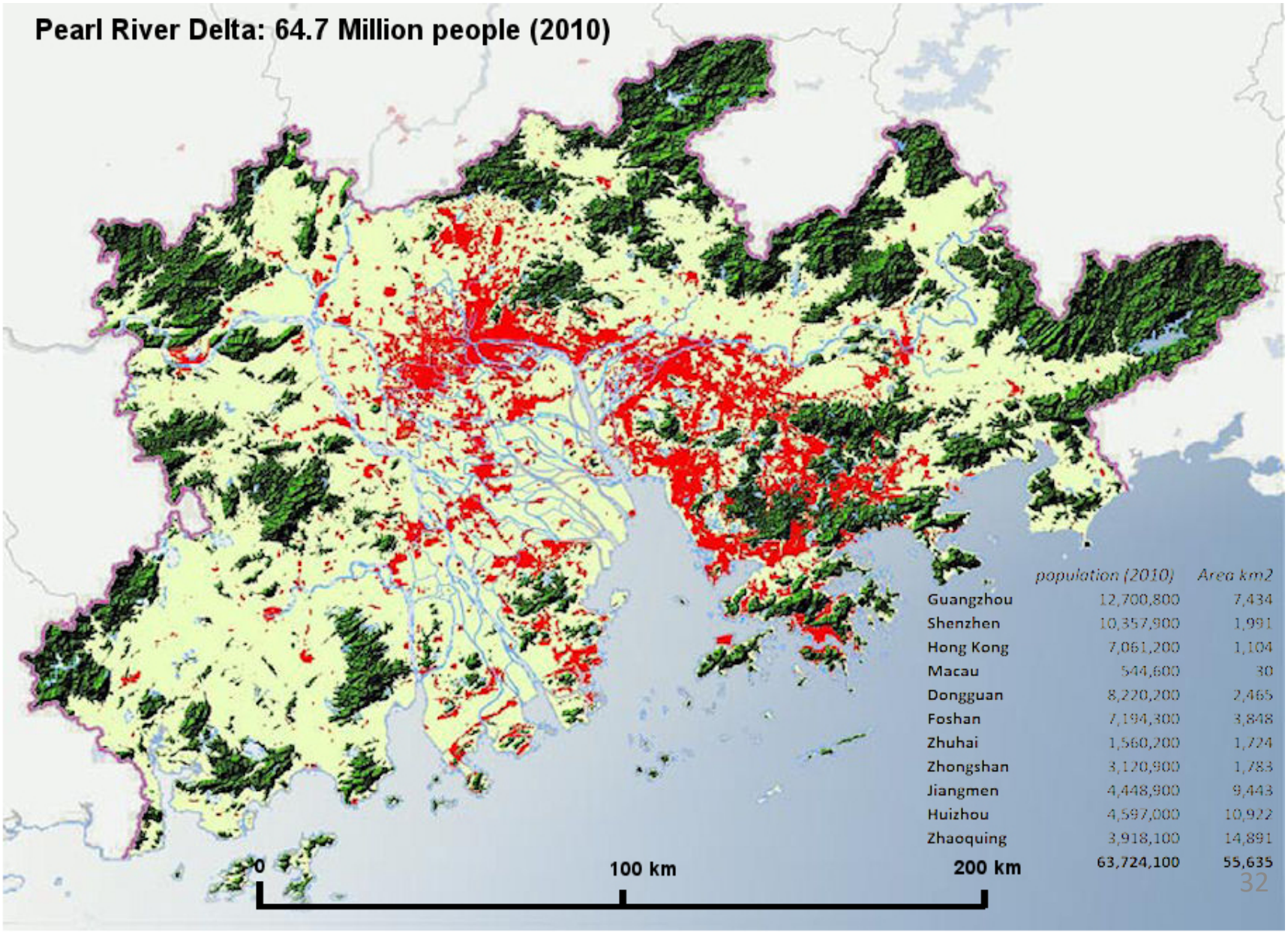
Expected trips pattern in an urban cluster





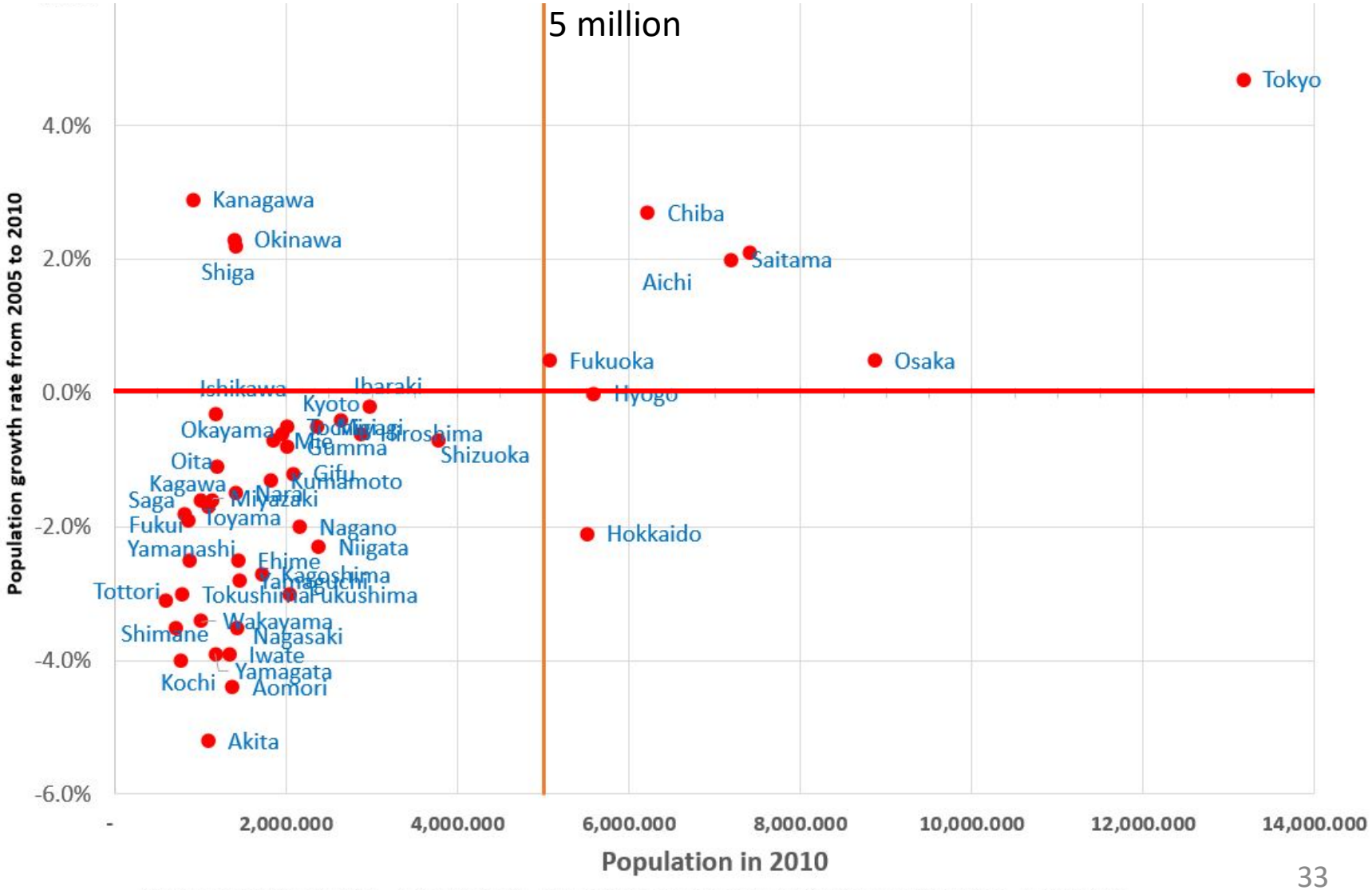


Guangzhou, Shenzhen and Hong Kong have high density core but are surrounded by a lower density hinterland.



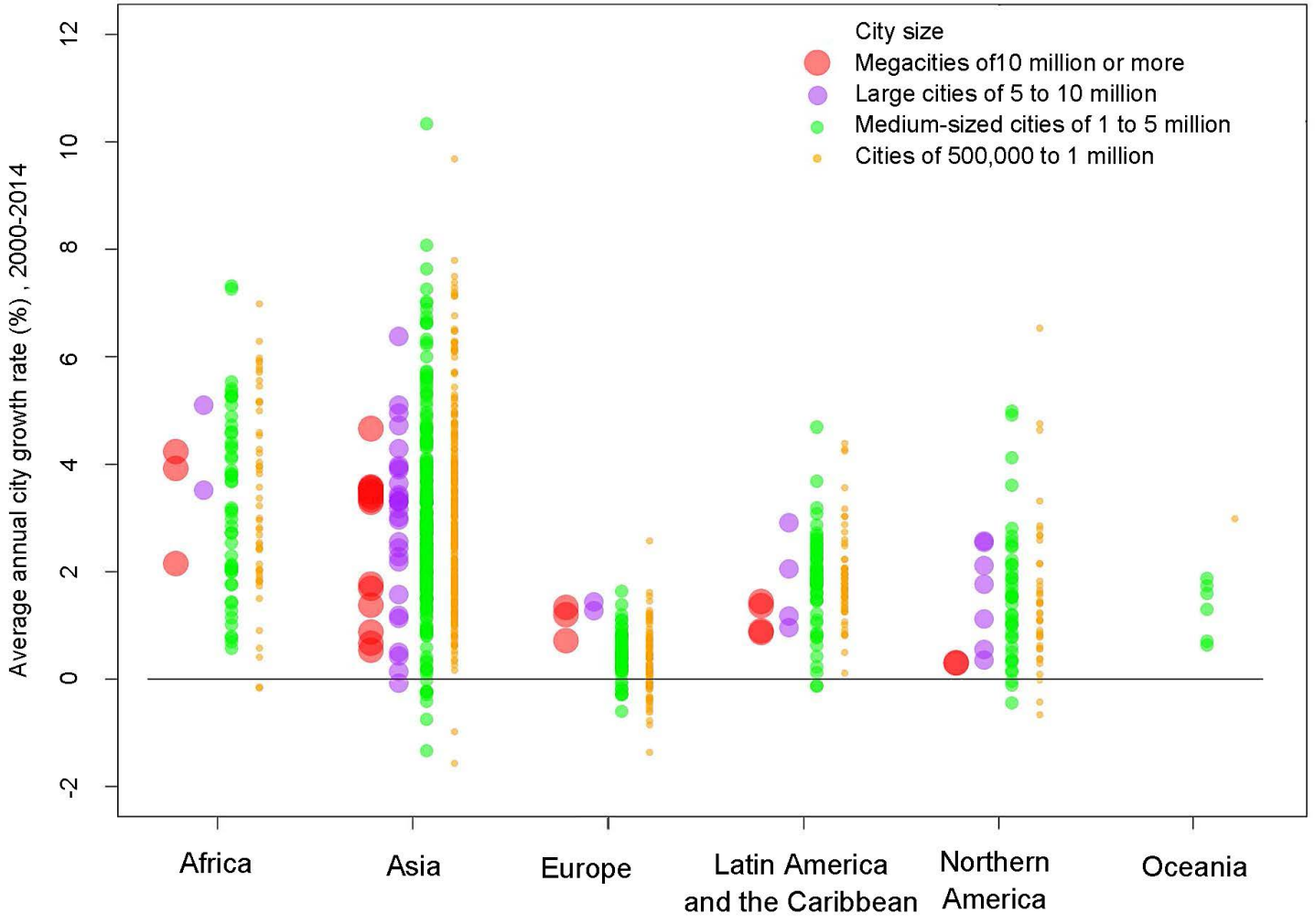
	population (2010)	Area km2
Guangzhou	12,700,800	7,434
Shenzhen	10,357,900	1,991
Hong Kong	7,061,200	1,104
Macau	544,600	30
Dongguan	8,220,200	2,465
Foshan	7,194,300	3,848
Zhuhai	1,560,200	1,724
Zhongshan	3,120,900	1,783
Jiangmen	4,448,900	9,443
Huizhou	4,597,000	10,922
Zhaoquing	3,918,100	14,891
	63,724,100	55,635

Growth rate of Japanese cities depending on their size between 2005 and 2010



Sources: New Geography - Demographia - Japan Population Trends by Region and Prefecture, 1970-2010

In some regions many existing cities will shrink, while others will expand into megacities clusters of more than 50 million people



Sources: United Nations, Department of Economics and Social Affairs, Population Division, (2014). World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER.A/352)

Shrinking cities in affluent countries have still a large comparative advantage, the way they handle foreign immigration will decide of their fate

The pace of immigration will depend on the time needed for immigrants to adapt to the successful urban norms of host cities while maintaining their own culture

The main obstacle to urban development in a democracy: The tyranny of the "settled" over the "not yet settled"

LULU – Locally Unwanted Land Use

NIMBY – Not In My Back Yard.

NOPE – Not On Planet Earth

BANANA – Build Absolutely Nothing Anywhere Near Anything.