

IMPACT OF MARKETS, DESIGN AND REGULATIONS ON URBAN DENSITIES ICRIER

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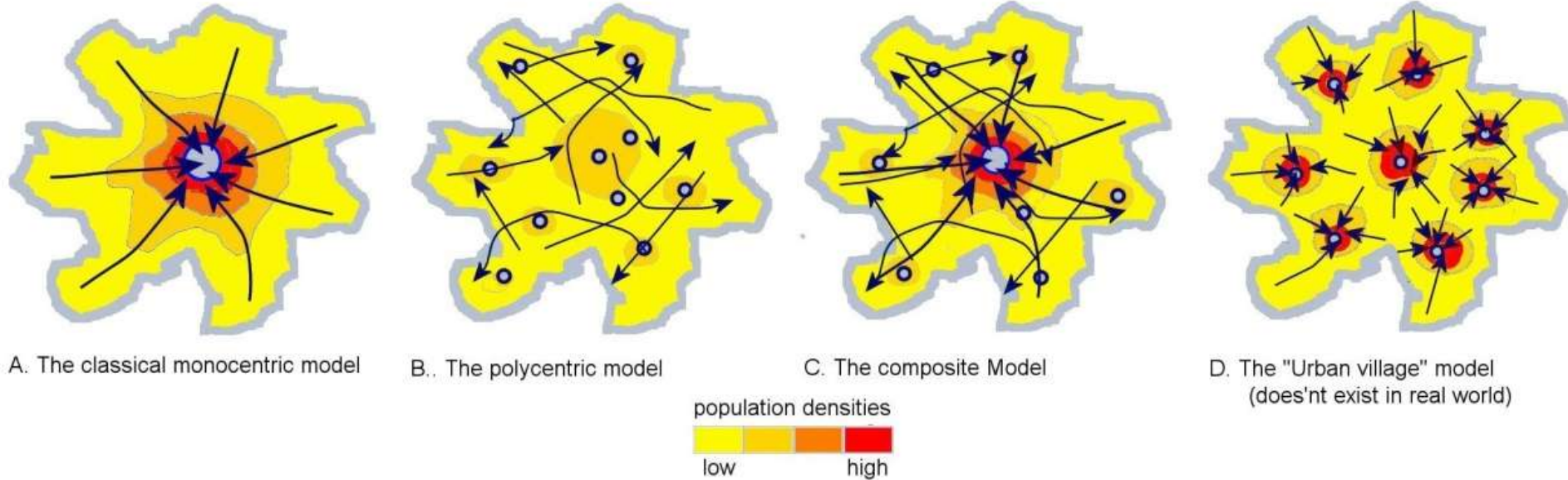
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1. CITIES SEEN AS LABOR MARKETS

Large cities are created by the economic efficiency of large labor markets

- Large cities grow because of the increased productivity produced by large labor markets:
 - Economy of scale
 - Knowledge spill-over
 - Agglomeration economies
- Smaller cities also grow because they are cheaper to operate
- Some activities migrate from large cities to smaller cities
- Congestion is a tax on the productivity of large labor markets

Mobility and labor markets



The labor market requires mobility between:

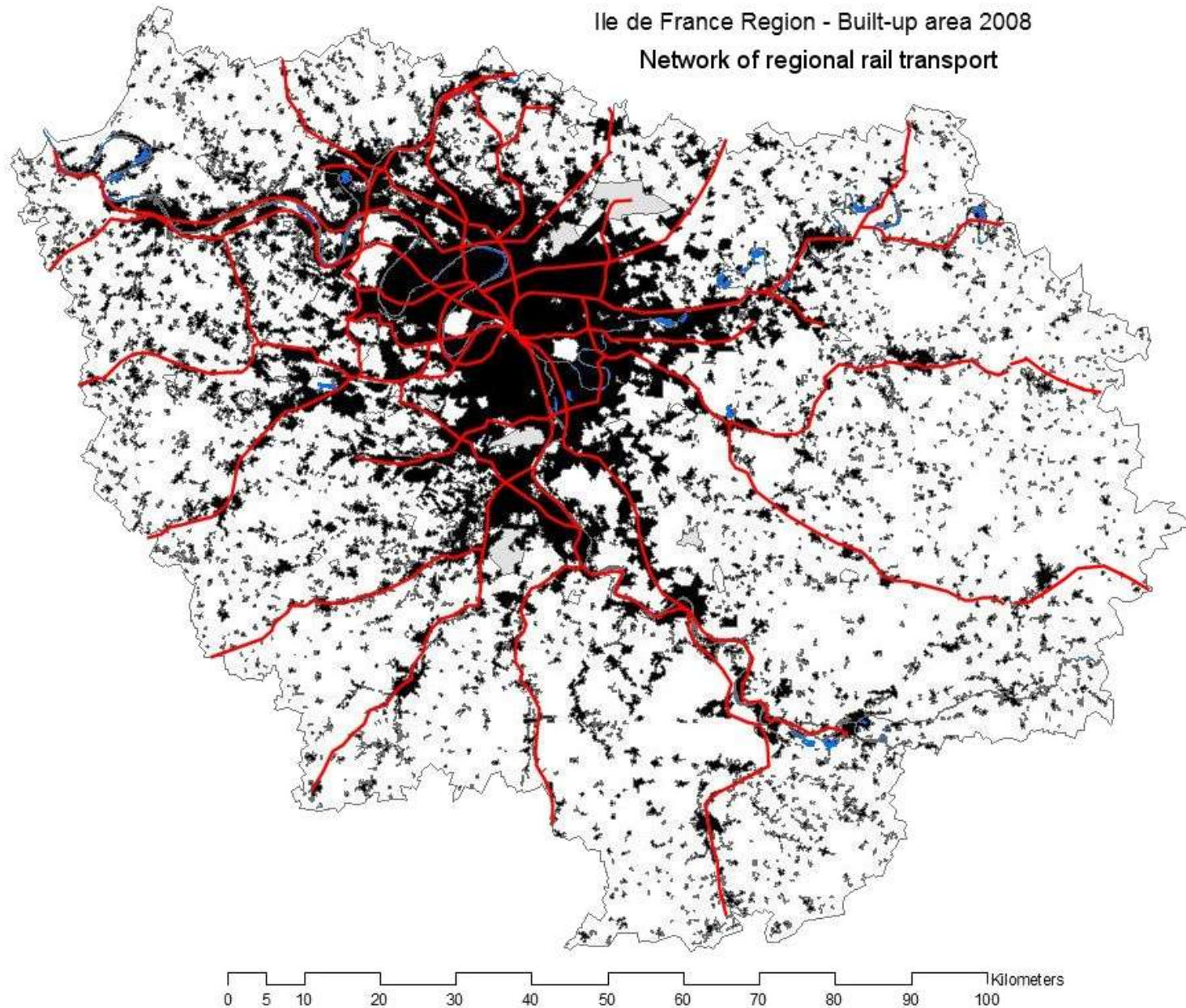
1. workers, consumers and firms, and
2. between firms

The pattern of trips defines a city structure

The pattern of trips in large metropolitan areas is increasingly complex

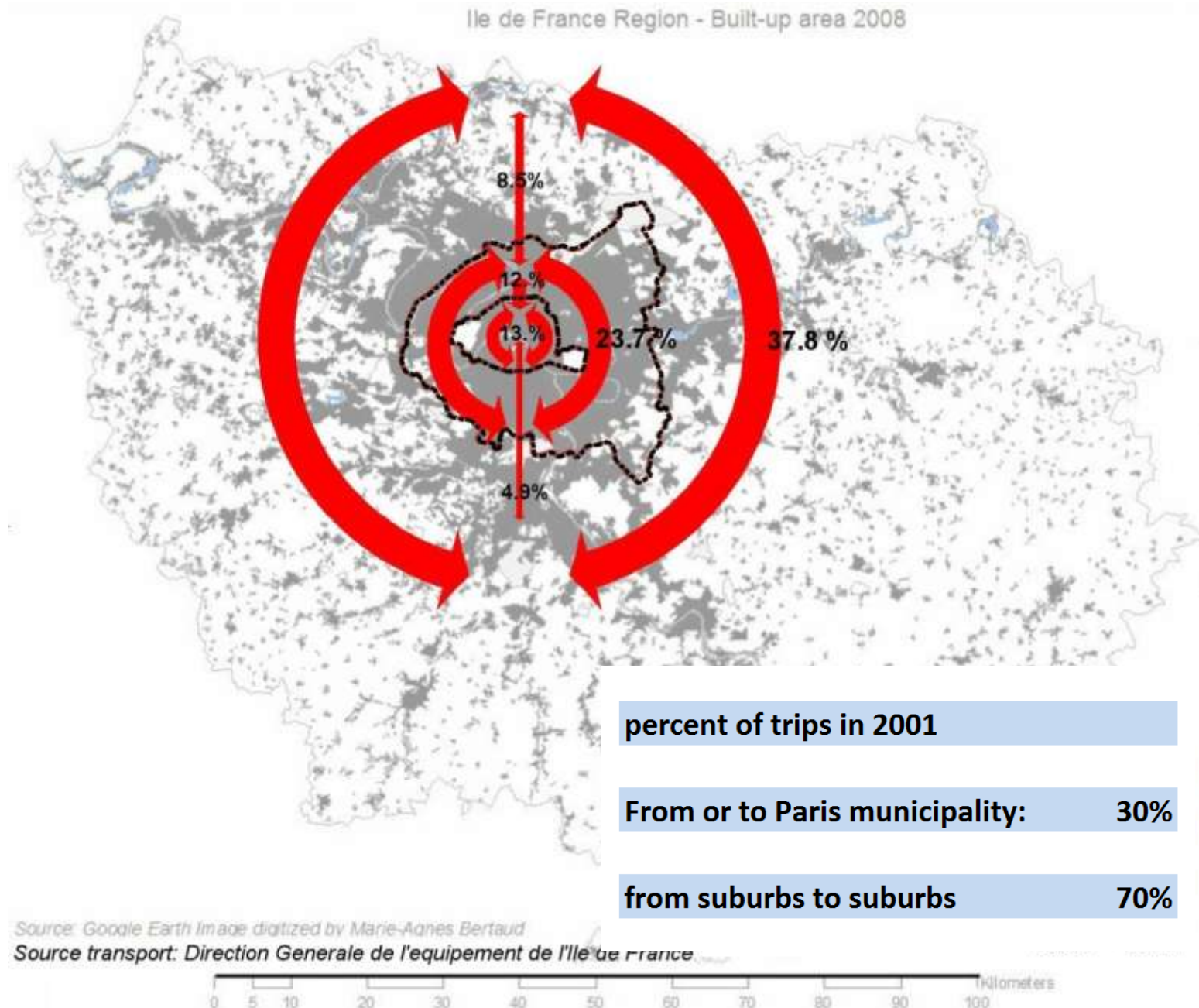
- Traditional transit systems can serve well only a portion of trips, mostly toward the traditional city center
- Increasingly, the majority of trips are from suburbs to suburbs.
- These trips are impossible to serve by public transit but require individual transportation
- The car, as currently designed is ill suited for urban transport: it consumes too much valuable real estate

Rail transport network in Paris metropolitan area is serving only a portion of the labor market



Source: Google Earth Image digitized by Marie-Agnes Bertaud

The trips generated by the labor markets cut across the metropolitan areas

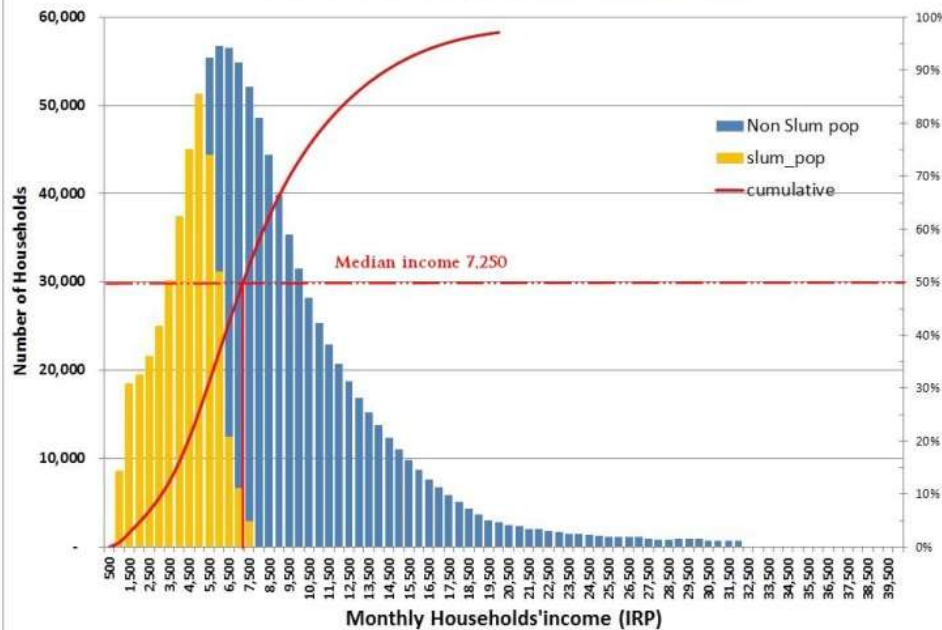


2. MARKETS AND DESIGN

It is important to distinguish market forces from deliberate design in the creation of urban land use

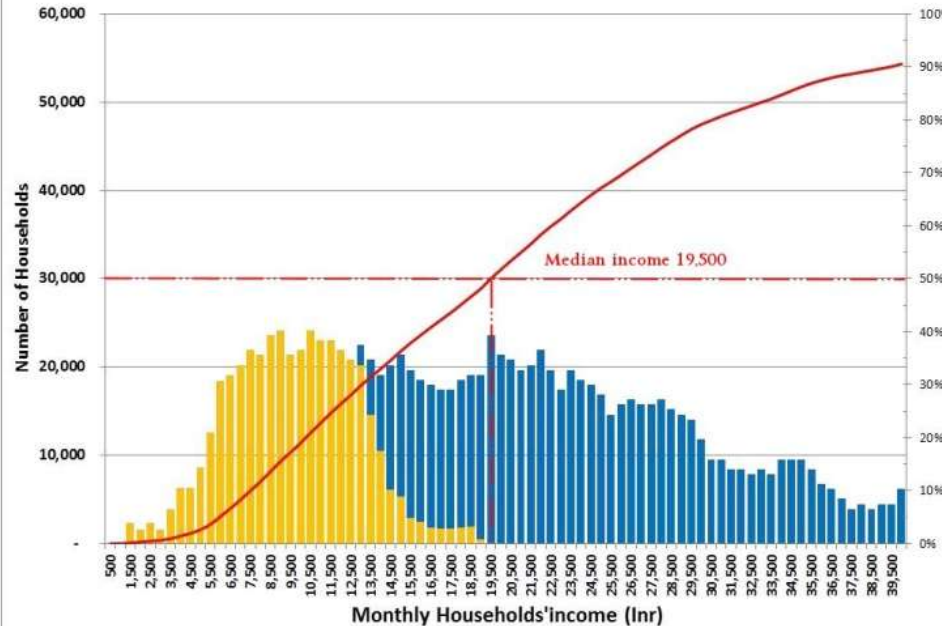
- Markets are blind mechanisms that are spontaneously created by humans but not controlled by them
- Design is a rational action by a group of individuals. Design requires a clear and limited objective
- Markets are indispensable for allocating land between competing users
- Design is indispensable to create primary transport infrastructure

Ahmedabad - Households income distribution 2001



Residential consumption of floor space and land is linked to income (demand side) but also to the supply of land and floor area ratio.

Ahmedabad - Households income distribution 2011



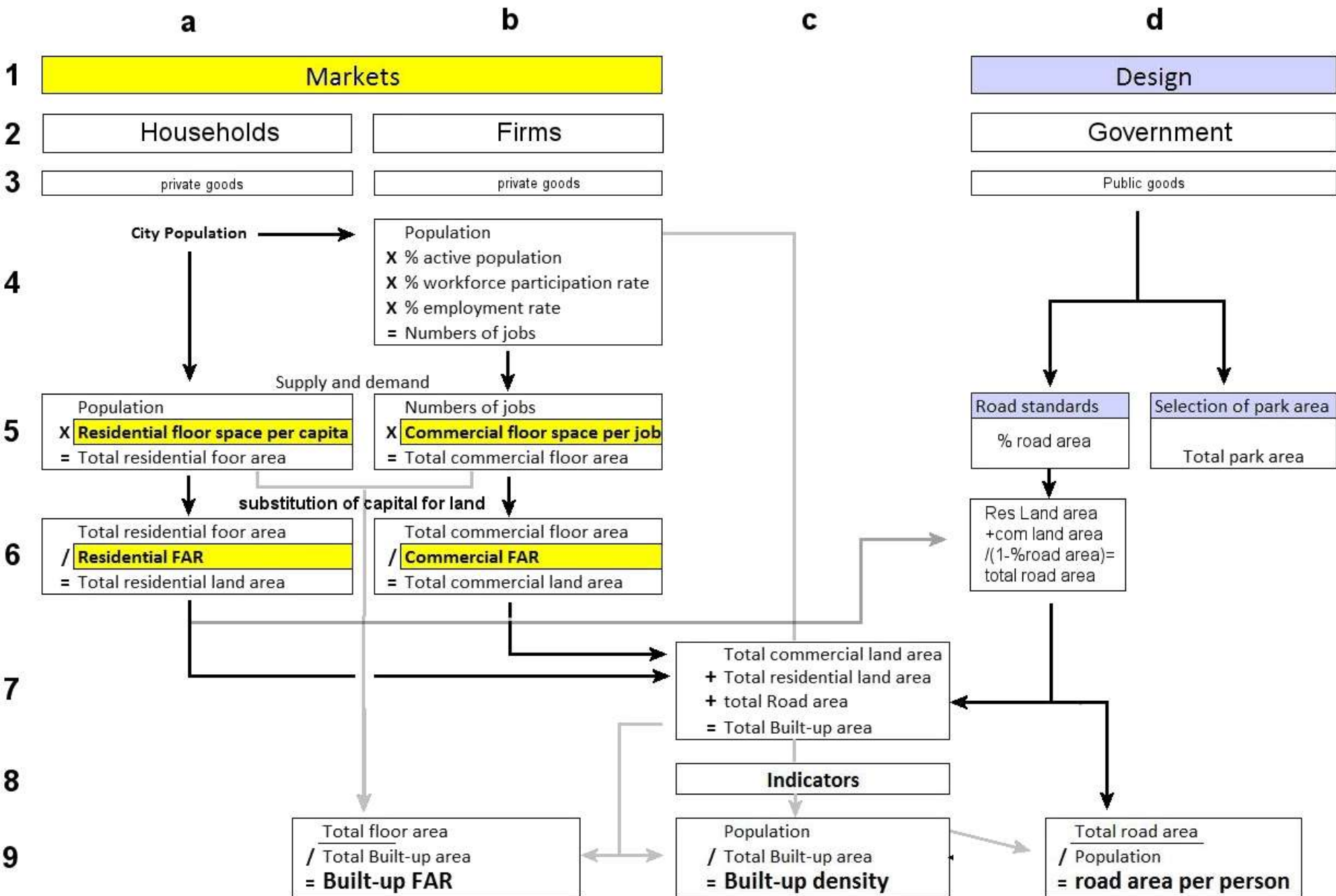
If income increases but the supply of land and floor space is constrained, the increased income results in higher prices, not increased housing consumption.

The end product of cities is not land but floor space

- The concentration of floor space is created by markets in formal and informal areas
- The total area of floor space developed for housing and commerce is defined by markets



Markets, Design and densities



Differentiating markets from design:

Pudong, the new financial center of Shanghai



- The concentration of floor space in Pudong is due to markets
- But this has been possible because of the “design” of tunnels and infrastructure integrating Pudong to the rest of the city



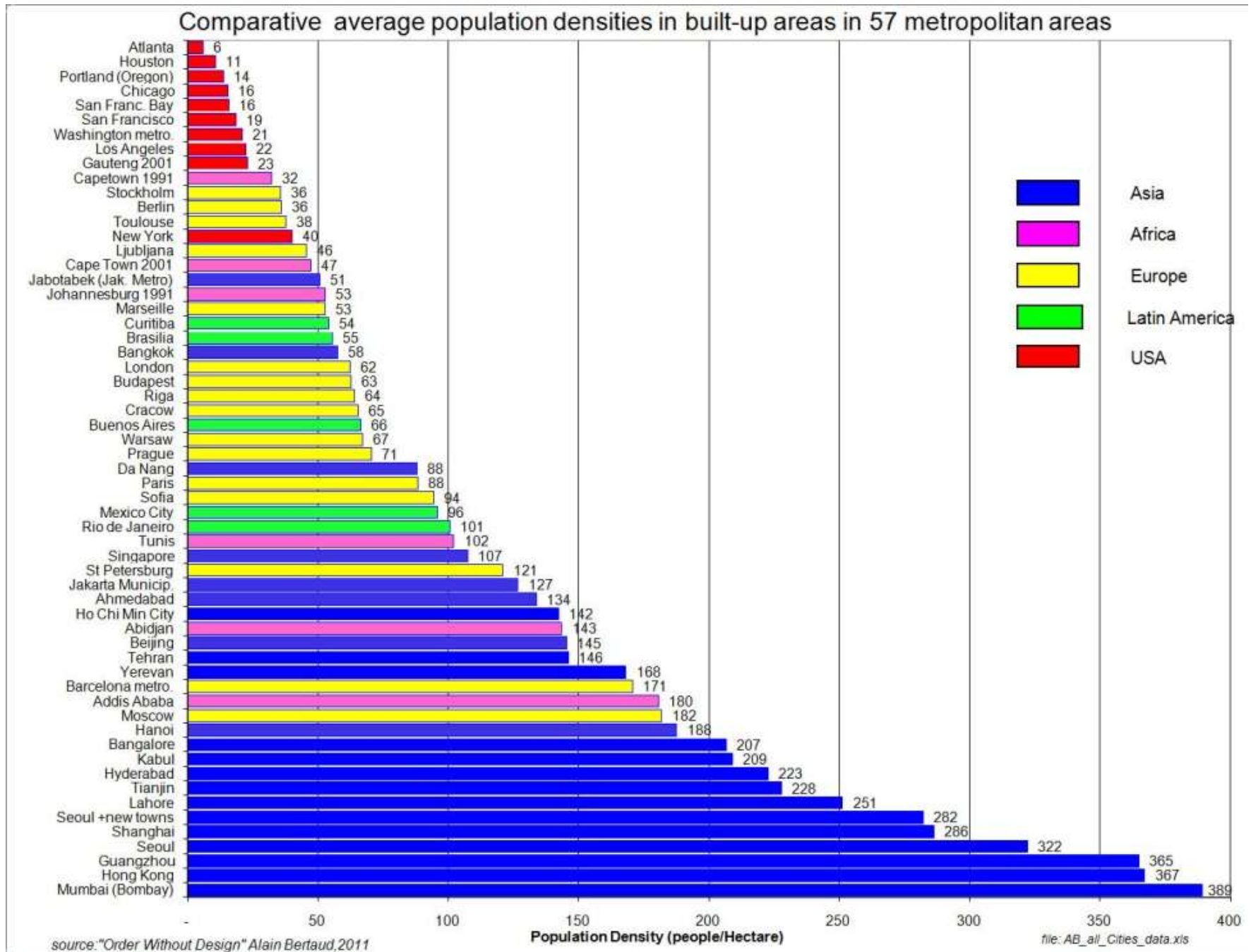
Major Roads
Ferry
Pudong in 1982
5km



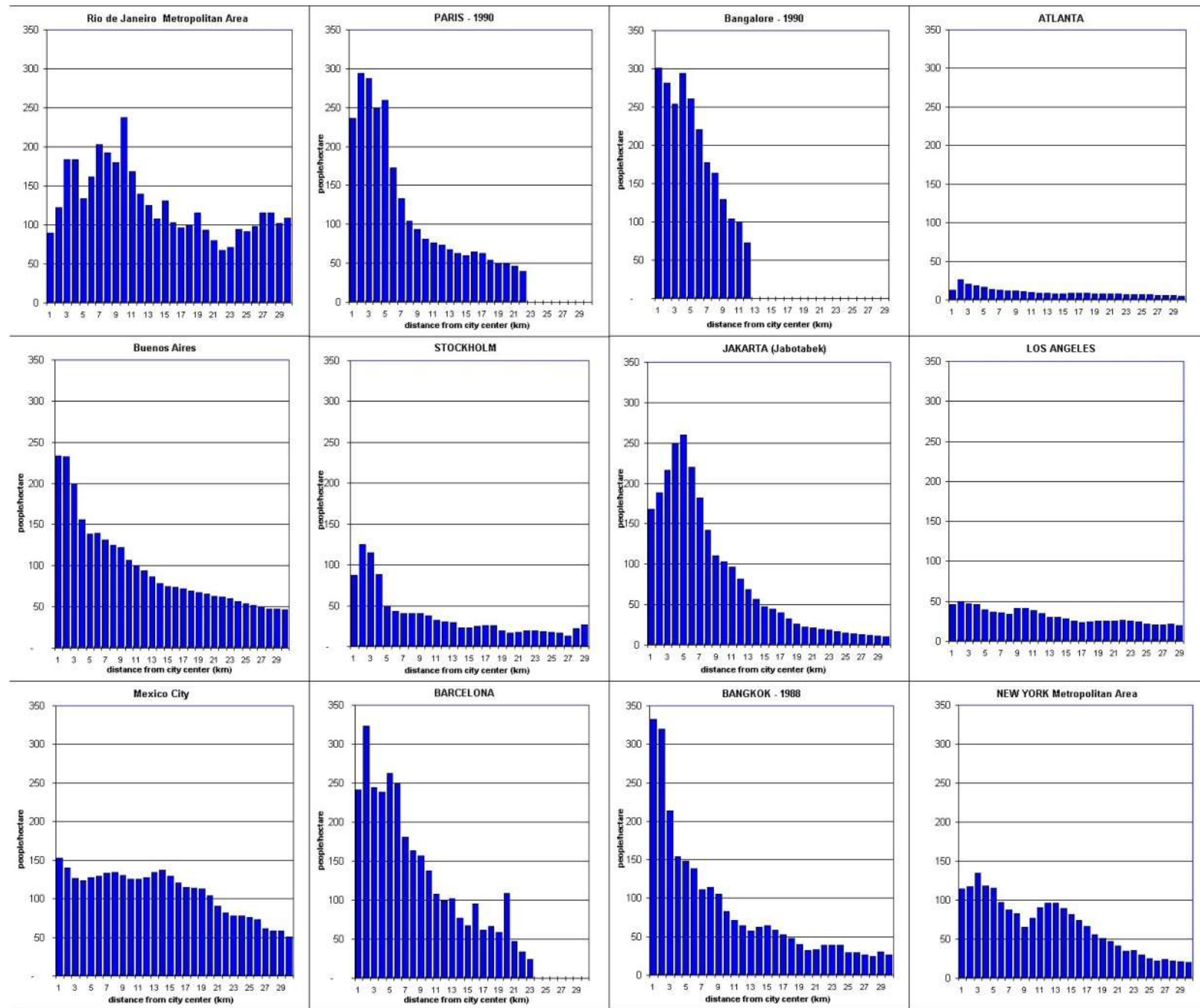
Major Roads and tunnels
Subway lines
Pudong in 2013
5km

3. URBAN DENSITIES ARE SET BY CULTURE AND MARKETS - NOT BY DESIGN

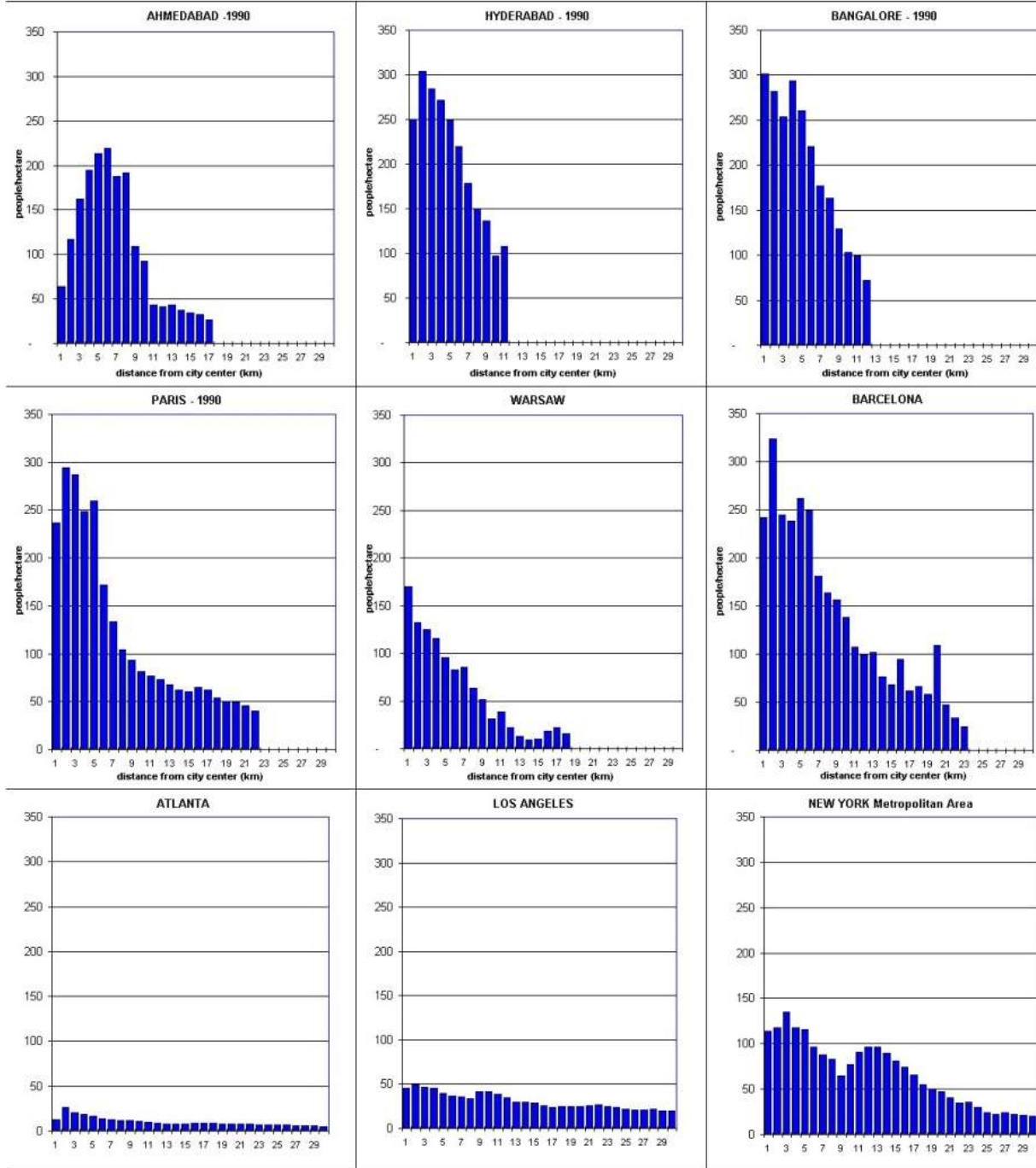
There are no “optimum densities” only land supply constraints and consumers’ choices



COMPARATIVE POPULATION DENSITIES IN THE BUILT-UP AREAS OF SELECTED METROPOLITAN AREAS

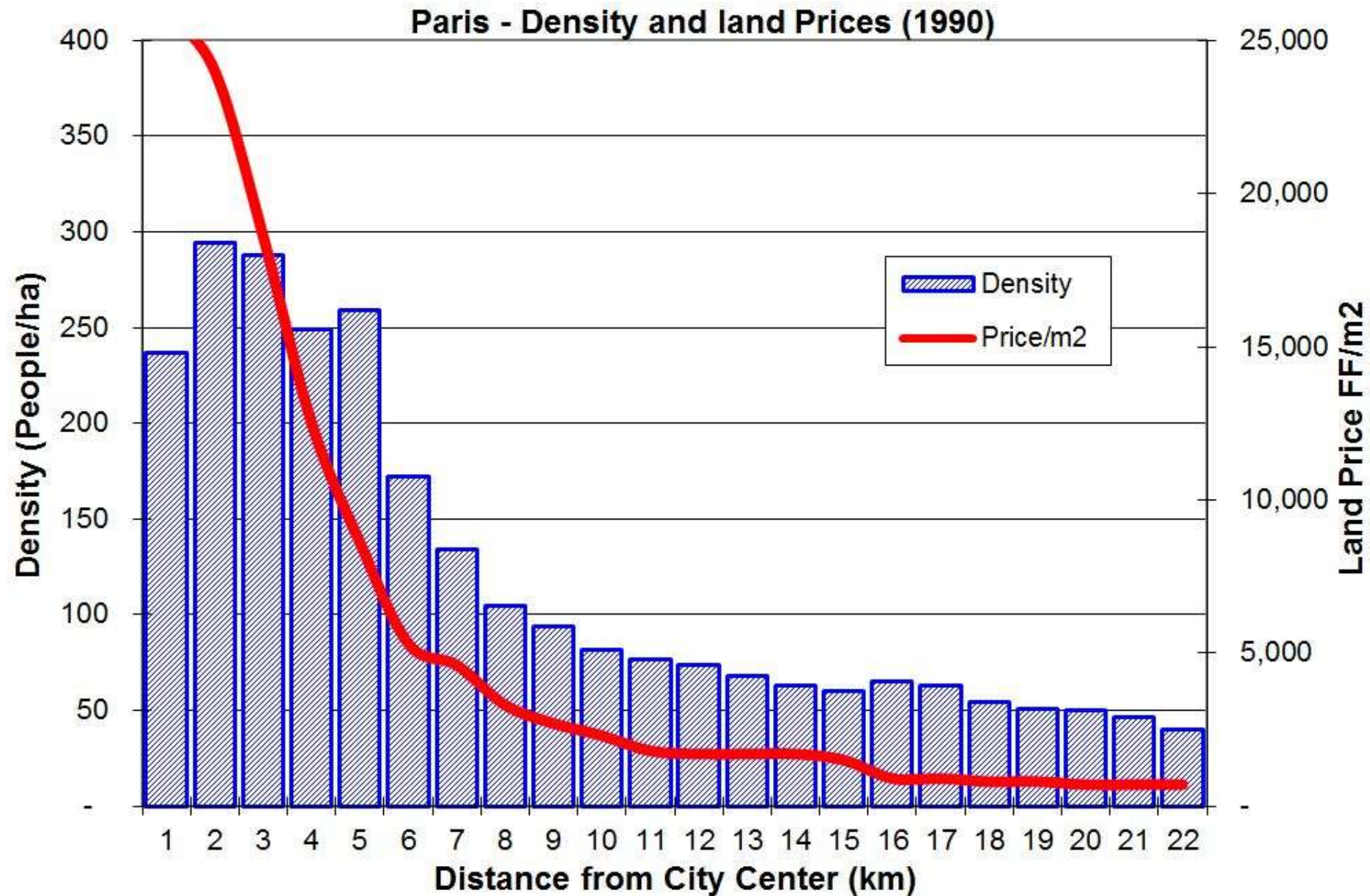


COMPARATIVE POPULATION DENSITY PROFILE OF THE BUILT-UP AREAS OF SELECTED METROPOLITAN AREAS



The density profile
of 3 Indian cities
compared to 3
European and US
cities

Densities are following land prices
densities are therefore set by markets not by design



Because different income groups consume land and floor space differently, tall buildings do not always result in higher densities



Moti Nagar's density is 50% higher than Patel Nagar's, although the FAR is more than 4 times lower!

Comparative land use between formal and informal settlements

Mumbai - 42 km north of Nariman Point (lat: 19.306934 o N, lon 72.846461 o E)

		Informal	Formal
		Moti Nagar	Patel Nagar
Average number of floors	u	1	7
Average floor area per dwelling ⁽¹⁾	m^2	17.5	81.3
Area of floor space per person	m^2	3.50	23.21
Area of land per person	m^2	4.04	6.16
Area of land per m2 of floor space	m^2	1.16	0.27
Area of land per dwelling	m^2	20.22	21.55
% of roads and open space	%	13.5%	46%
Gross FAR		0.87	3.77
Net residential density	people/ha	2,473	1,624

(1) including common corridors and staircases

**4. REGULATIONS OF THE FLOOR AREA
RATIO:
TRYING TO MODIFY MARKETS BY
DESIGN**

The Floor Area Ratio (FAR) or
Floor Space Index (FSI)
regulates the rate of substitution
between capital (floor space) and land

- The FAR is a market parameter not a design option
- It should be regulated only when a high FAR would create an obvious negative externality (proximity of airport, historical monuments, etc)
- Constraining FAR increases the foot print of cities and increases the price of housing

The Floor Area Ratio defines the financial viability of real estate projects

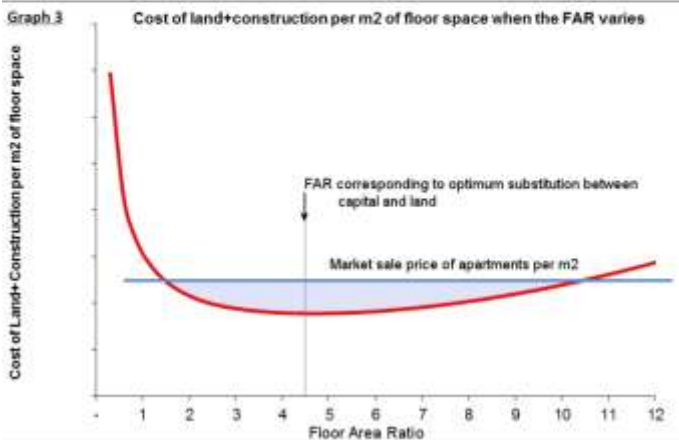
Cost of construction per m² of floor when number of floors increases



Cost of land per m² of floor area when FAR increases



Cost of land + cost of construction when FAR increases

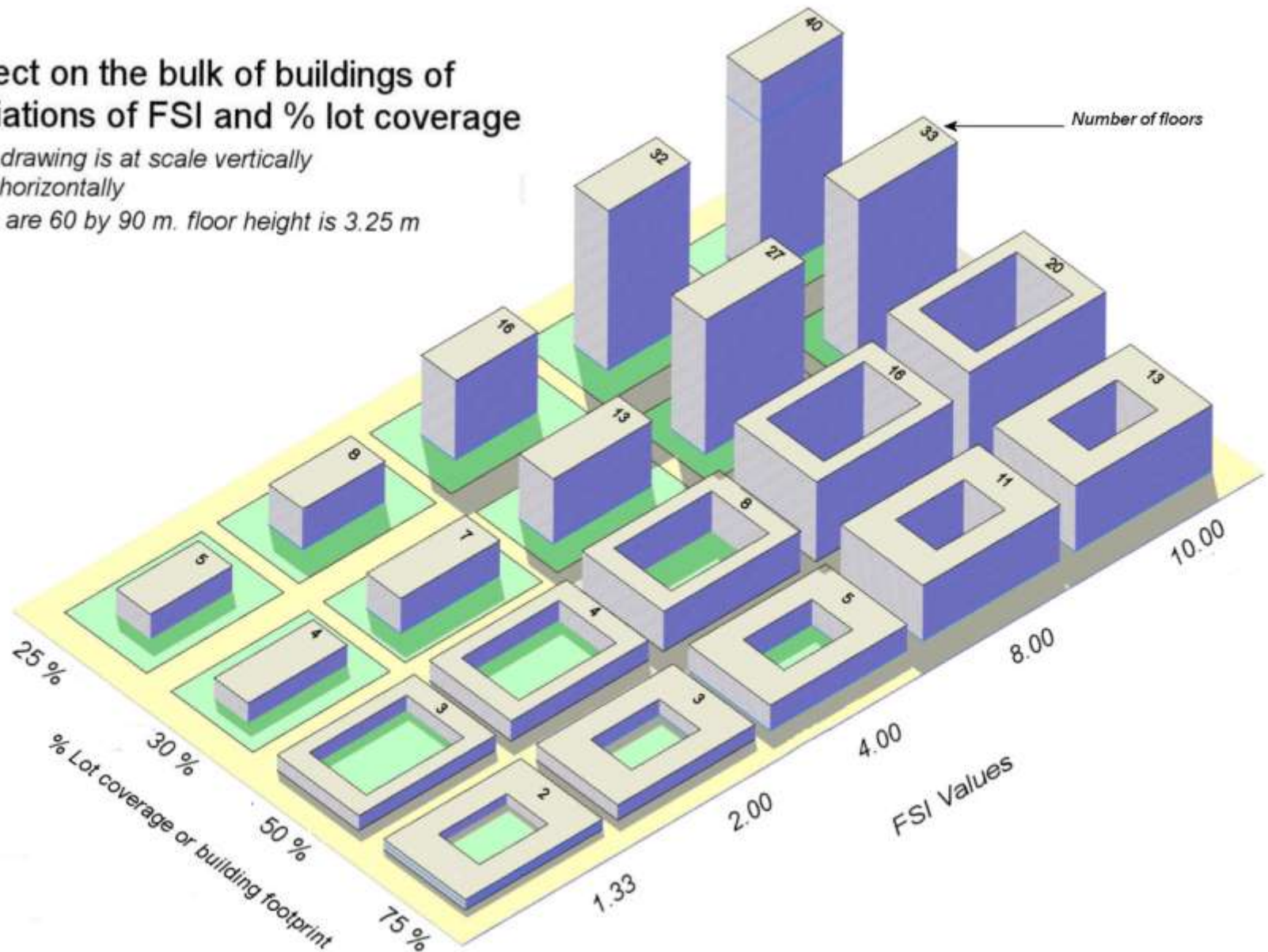


FSI has to be used in combination with lot coverage. Commercial and residential areas would have a different lot coverage for the same FSI

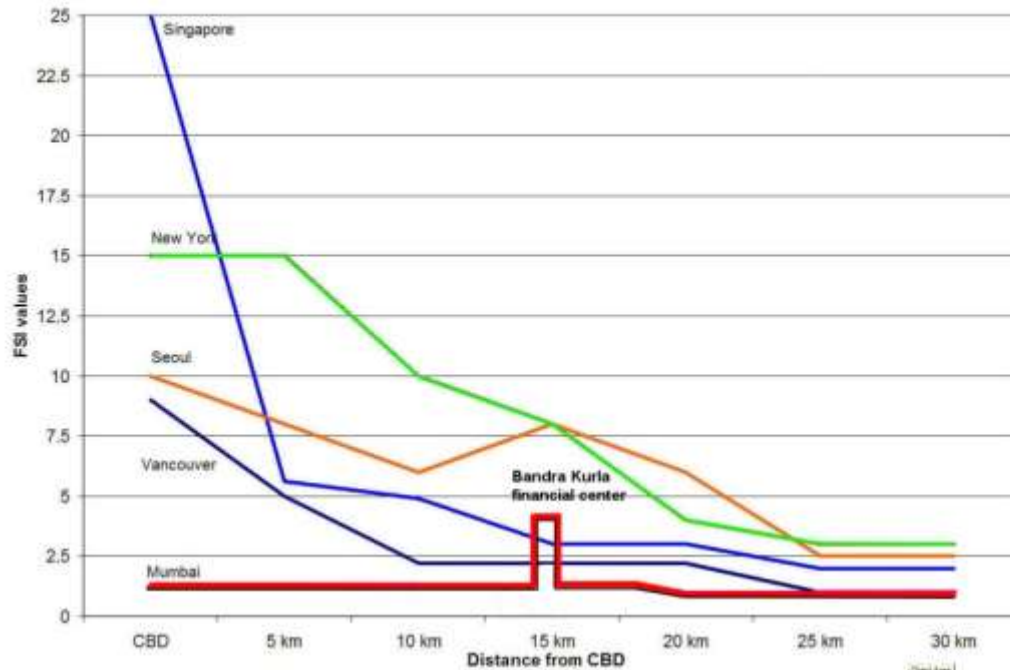
Effect on the bulk of buildings of variations of FSI and % lot coverage

The drawing is at scale vertically and horizontally

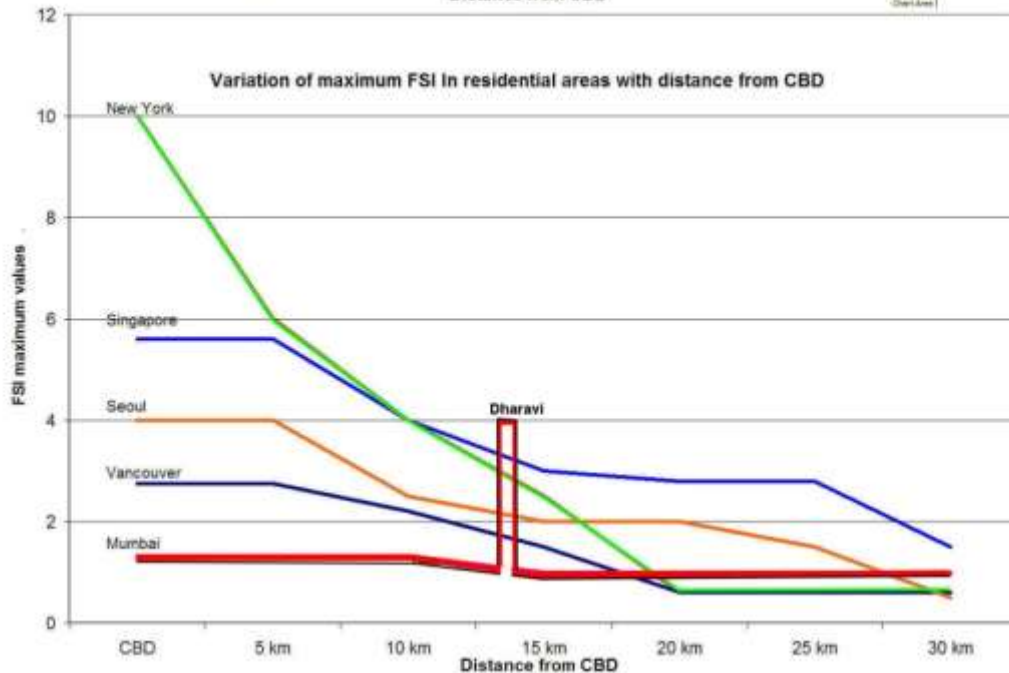
Lots are 60 by 90 m. floor height is 3.25 m



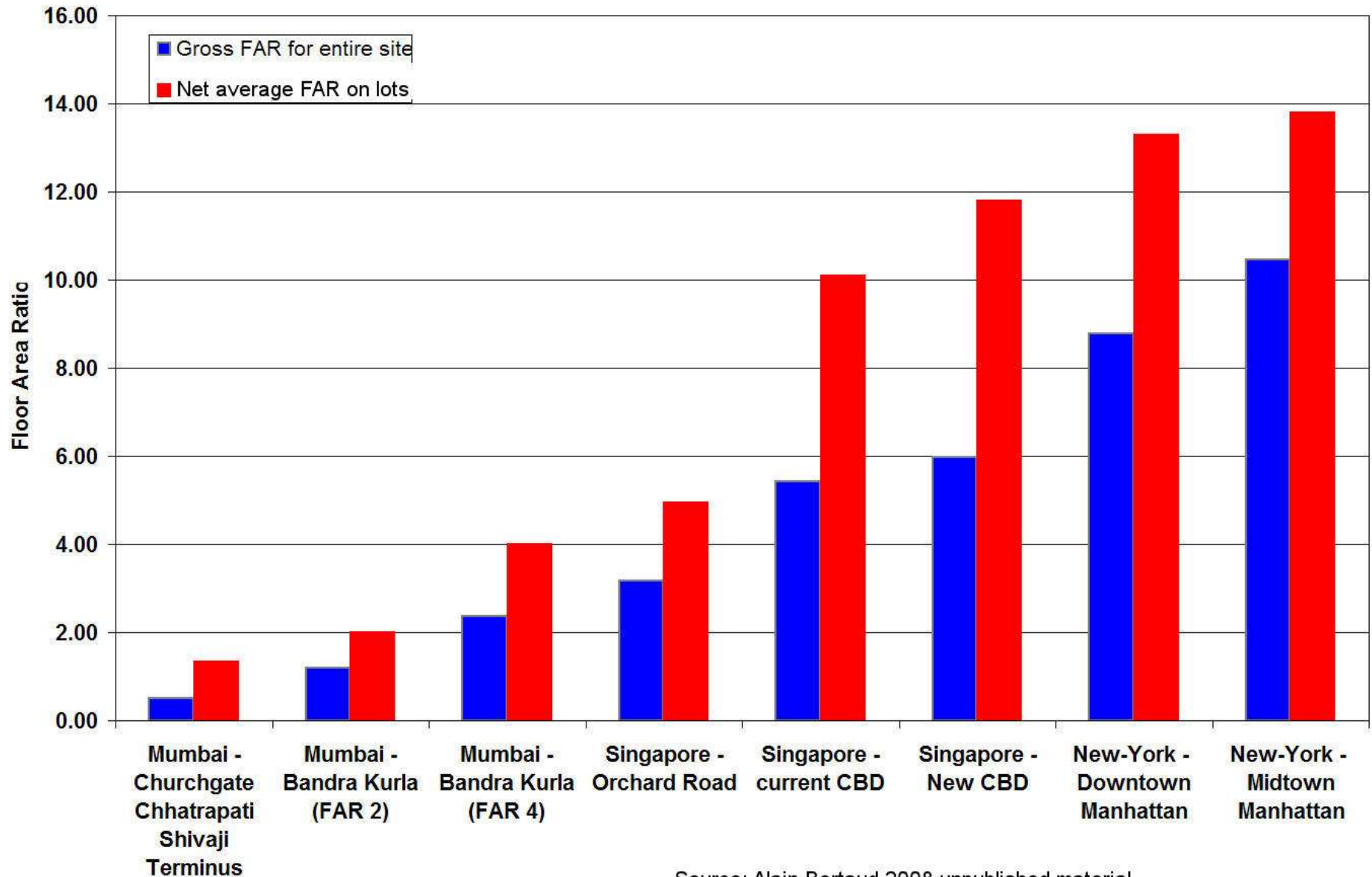
Variations of maximum FSI in commercial areas



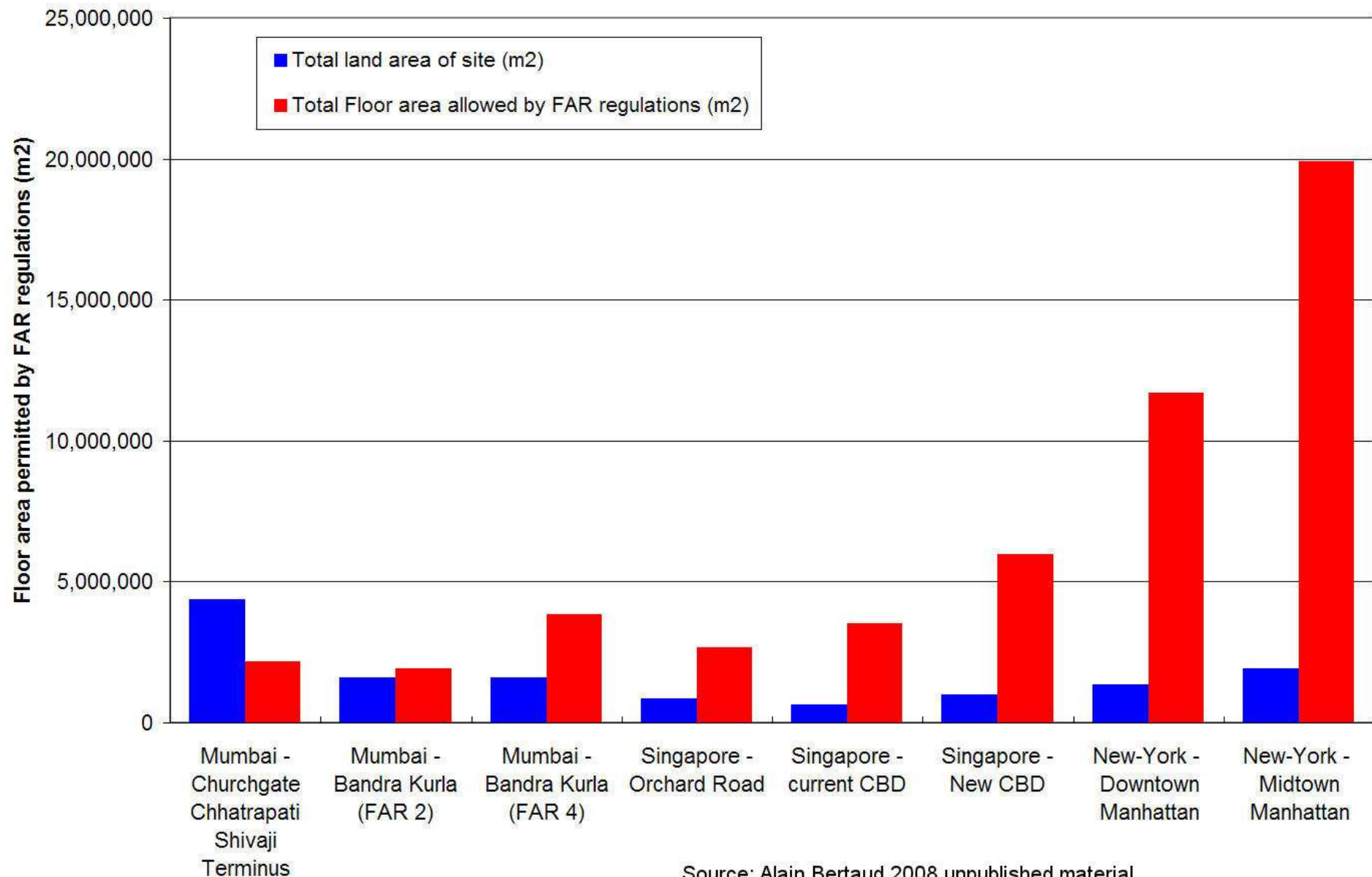
Profile of maximum authorized FAR by distance to main CBD in 5 major cities



Net and gross FAR in CBDs in Mumbai, Singapore and New York



Land and floor areas of CBDs In Mumbai, Singapore and New York





- Bandra Kurla, Mumbai

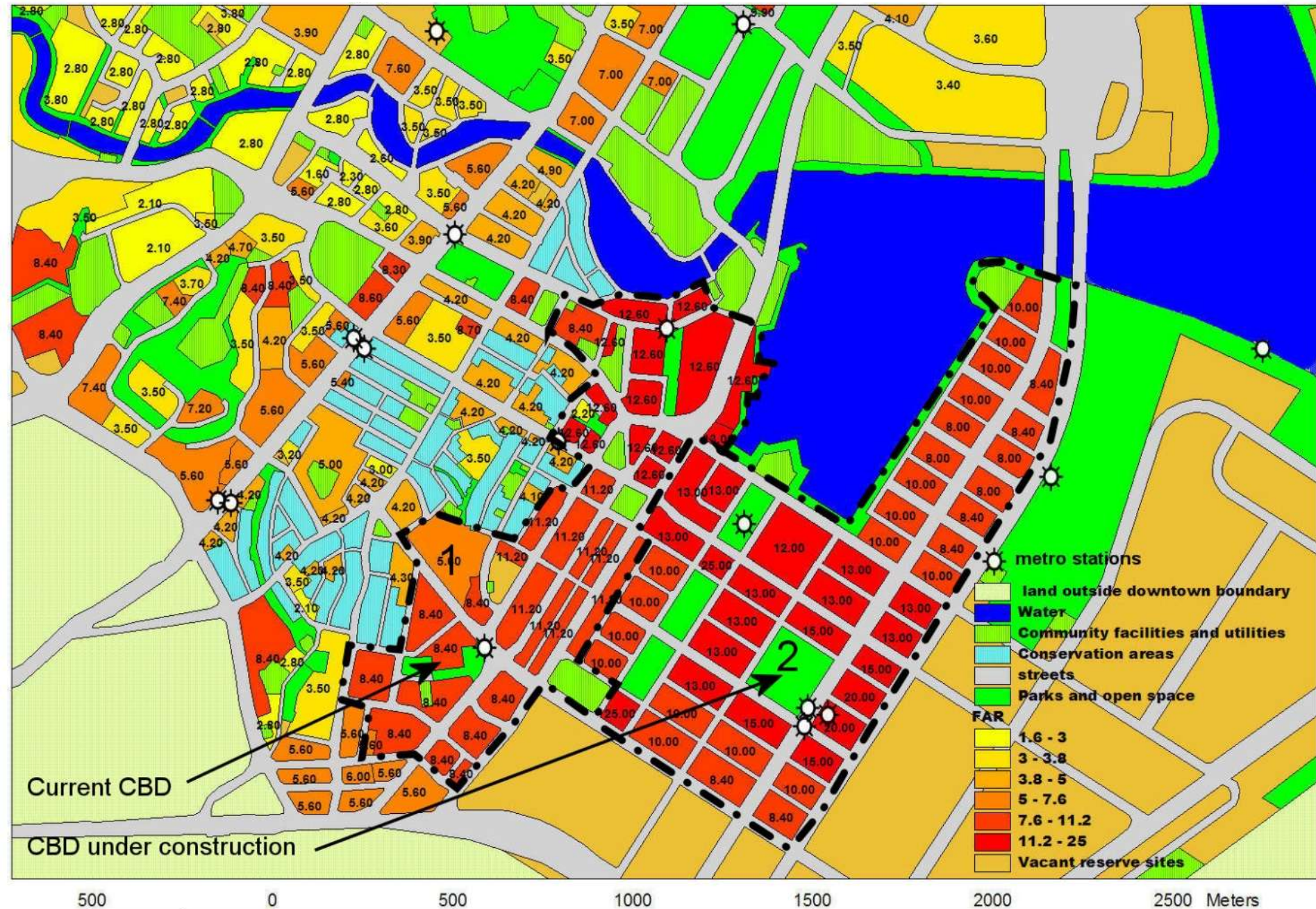


- Pudong, Shanghai

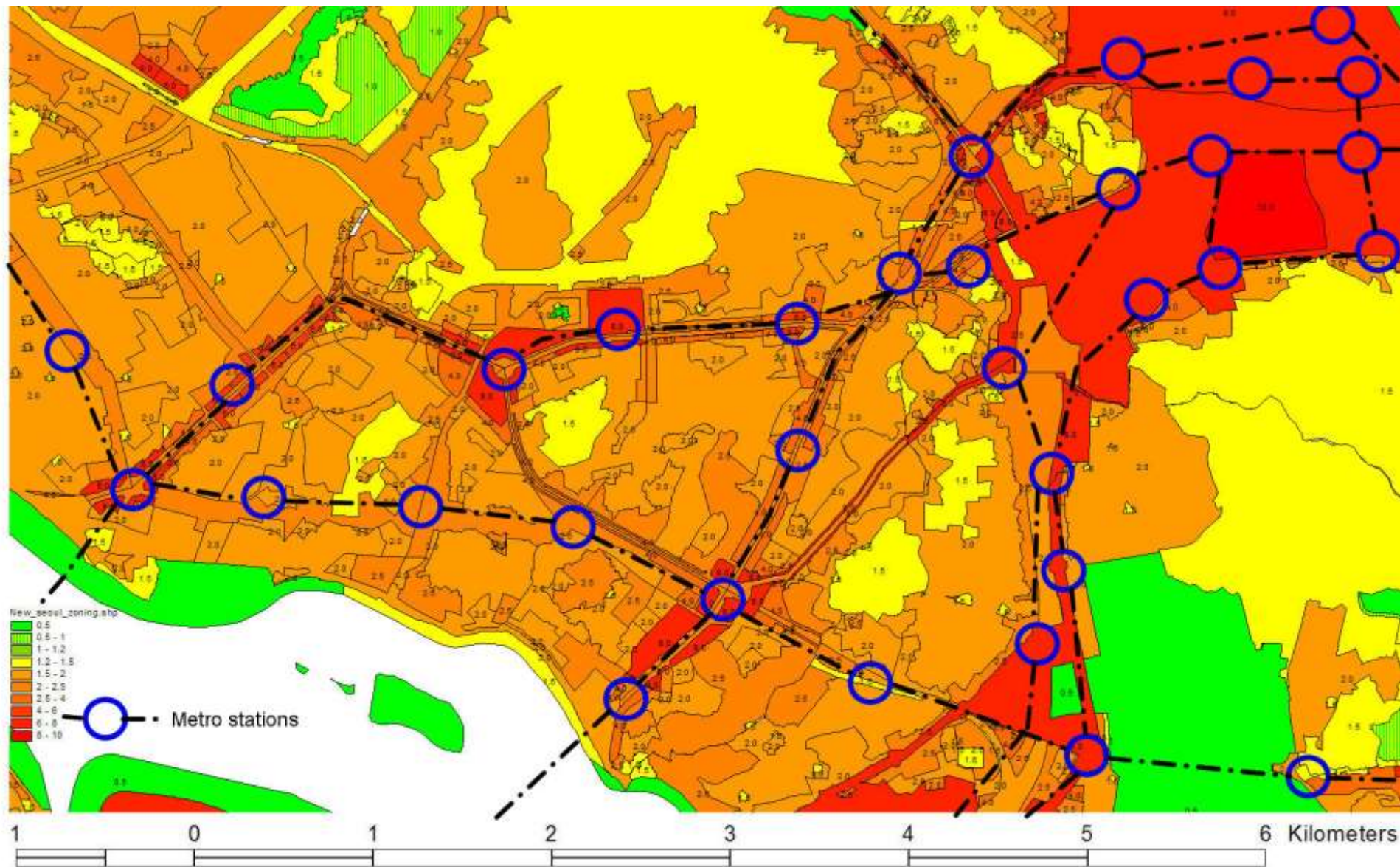


- Downtown Manhattan

FAR in Singapore's CBD



Far Regulations around Seoul's CBD



5. THE ROLE OF GOVERNMENT IN MANAGING THE SPATIAL EXPANSION OF CITIES: AFFORDABILITY AND MOBILITY

Maintaining land and floor space affordability: markets and design

- Consumption parameters should be left to consumers choices (markets)
- There should be no minimum size of plots neither minimum size of floor space
- Floor area ratio should follow markets, not constrain them
- “Design” has a very important role to play in expanding infrastructure and maintaining land supply elasticity (Mumbai Trans Harbour Link)

Maintaining mobility to increase the productivity of large labor markets : a key government role

- Increasing the speed of transport allow a higher productivity
- Mobility should be monitored by measuring the distribution of commuting trip time
- Only government can provide the right of way and the transport infrastructure that allow increased mobility