China's Cluster Cities: Urbanization at a Different Scale

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China urban cluster policy:

a new form or urbanization justified by the economic efficiency of large labor markets

China urban cluster policy: a new form or urbanization

- The urban cluster policy rests on three assumptions

1. Very large integrated labor markets are more efficient than smaller isolated ones
2. The past spontaneous trend creating clusters will continue but the guidance of the State will make them more efficient
3. New urban transport technology will be able to respond to commuting demand of 100 millions of people spread on areas of more than 20,000 square kilometers

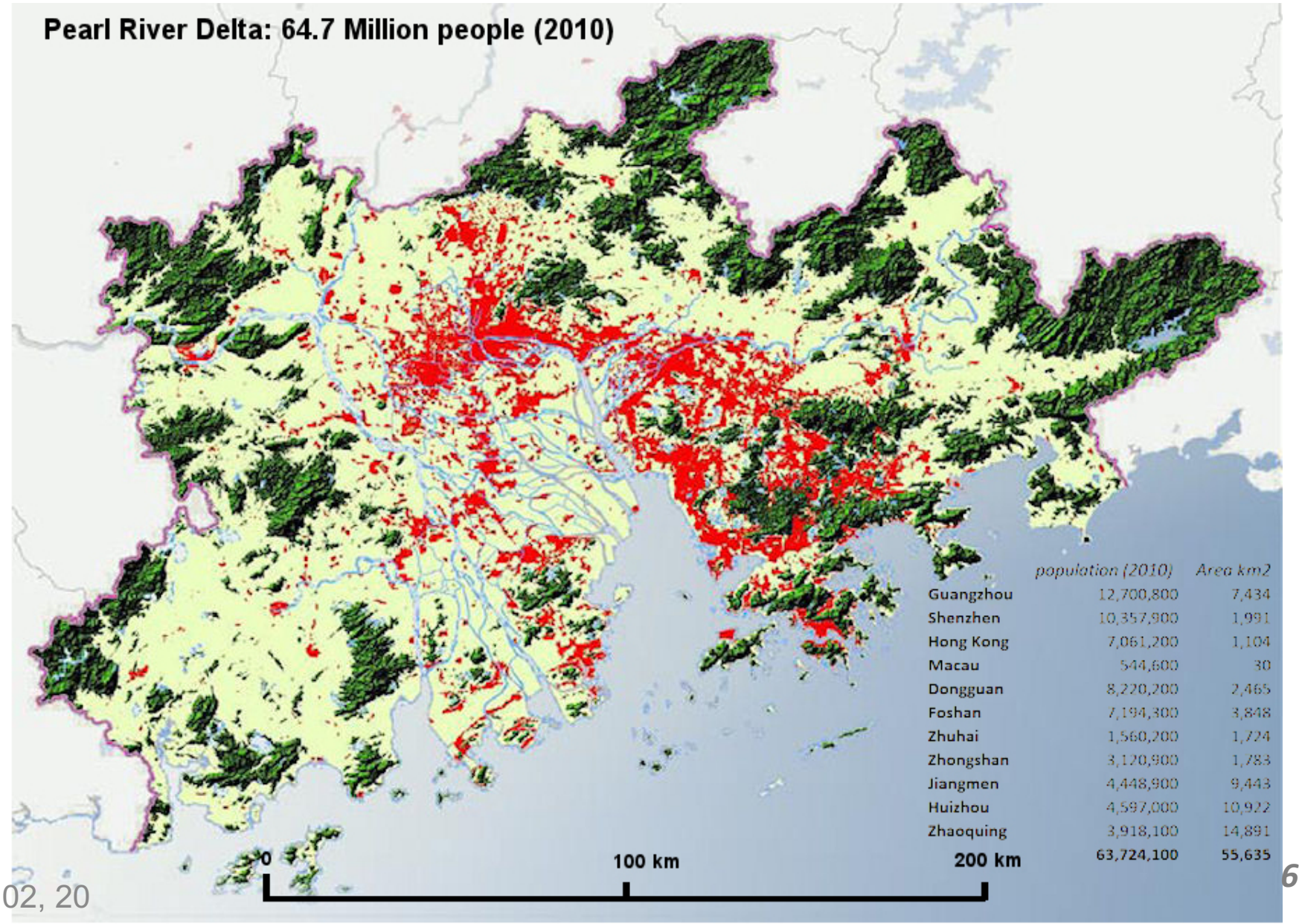
China's urban clusters policy recognizes the efficiency of a new urban form that has spontaneously emerged in China during the last 15 years

The efficient supply chains that gives China a competitive advantage in manufacturing was probably created by this new urban form

The urban cluster policy does not aim at creating new self sufficient suburban towns, but at integrating existing regional populations into one very large labor market

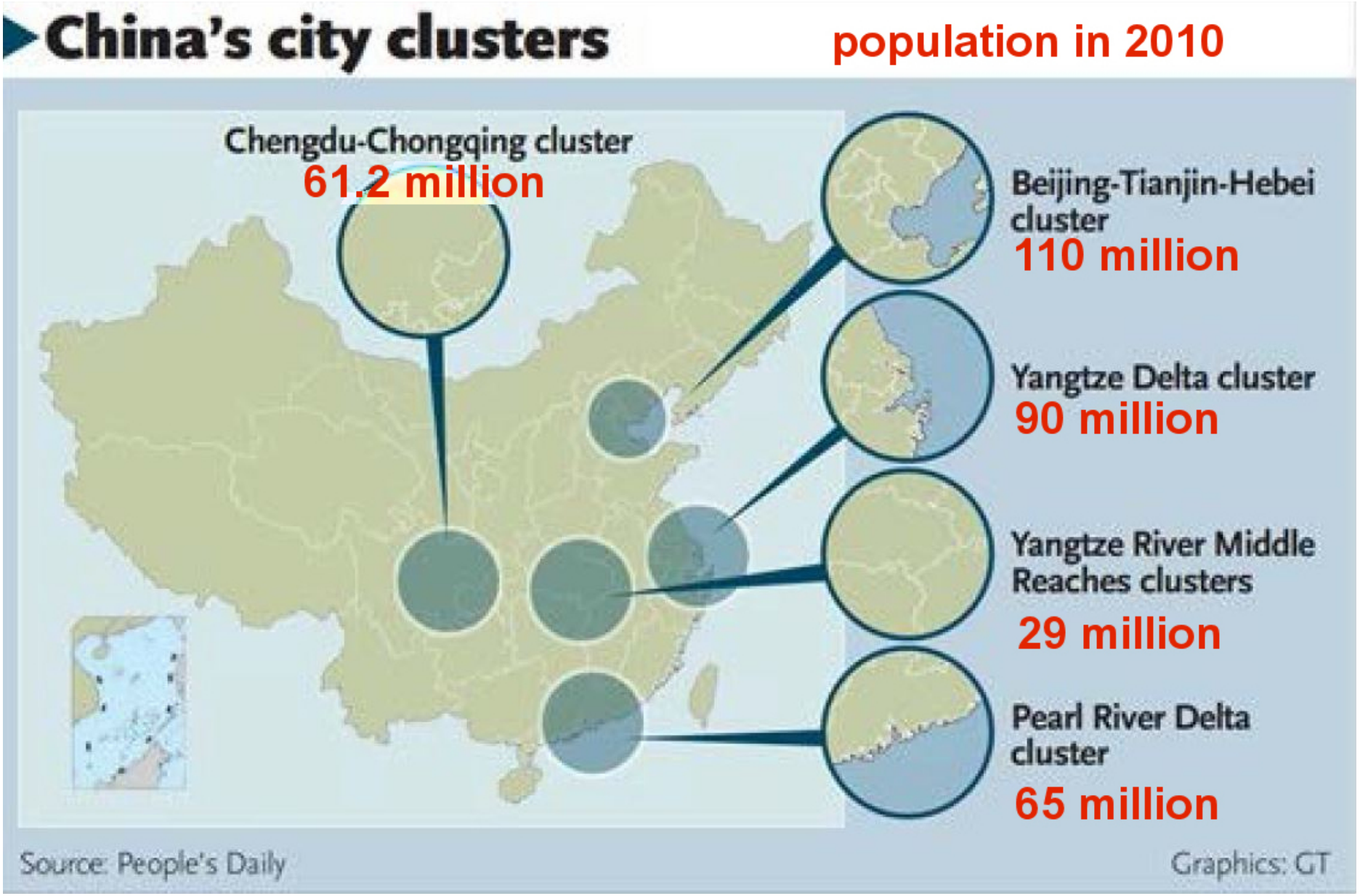
- The population of the urban clusters is already in place
- The challenge is to integrate this population into a unified labor market
- The current urban transport systems (subways, buses, individual cars and trucks) have already reached their capacity limit
- The main challenge will be to develop new urban transport systems where individual transports are combined seamlessly with rapid transit, instead of being independent separate mode of transports
- If the urban cluster policy succeeds in created integrated labor markets of more than 60 million people, the productivity and creativity of these clusters will be unprecedented.

Testing the size limit of large Labour market: The Pearl River Delta in China already connects more than 65 million people

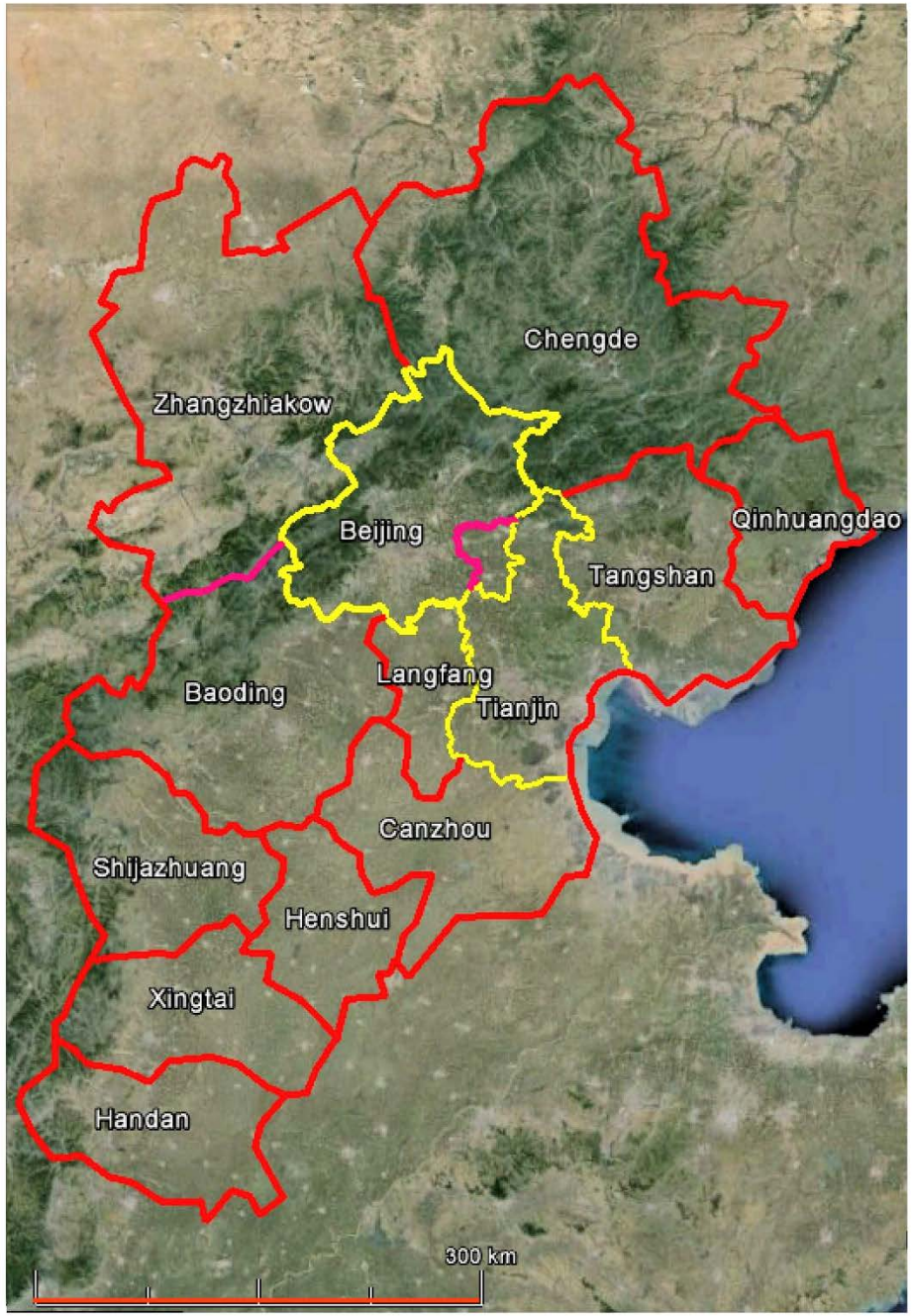


	population (2010)	Area km2
Guangzhou	12,700,800	7,434
Shenzhen	10,357,900	1,991
Hong Kong	7,061,200	1,104
Macau	544,600	30
Dongguan	8,220,200	2,465
Foshan	7,194,300	3,848
Zhuhai	1,560,200	1,724
Zhongshan	3,120,900	1,783
Jiangmen	4,448,900	9,443
Huizhou	4,597,000	10,922
Zhaoquing	3,918,100	14,891
	63,724,100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

China’s larger clusters



Beijing-Tianjin-Hebei cluster

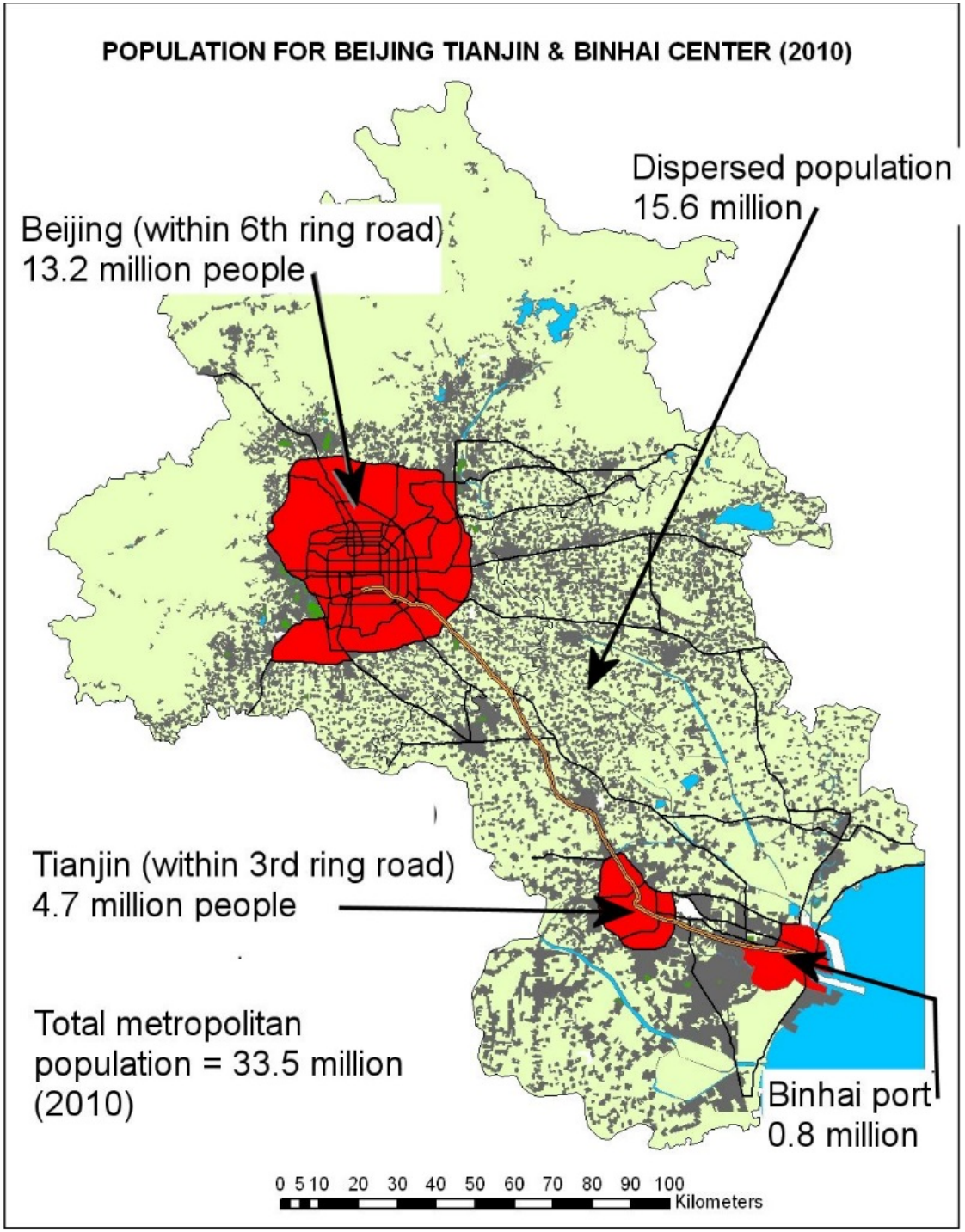


Components of Jing-Jin-Ji

Jurisdiction	Total Population (2013)	Density (per KM2)	Principal Urban Area Population (2015)	Urban Density (per KM2)
Beijing	21.2	1,300	20.2	5,100
Tianjin	14.7	1,200	10.9	5,400
Jing-Jin-Ji Core	35.9	1,300	31.1	5,200
Baoding	10.2	500	1.3	5,900
Langfang	4.4	700	0.5	3,800
Canzhou	7.2	500	0.5	3,800
Tangshan	7.5	600	2.4	8,700
Zhangzhiakow	4.6	100	1.2	9,200
Qinhuangdao	2.9	400	1.0	6,500
Chengde	3.7	100	0.1	4,300
Inner Jing-Jin-Ji	40.5	300	7.0	6,600
Shijiazhuang	10.4	700	3.4	17,000
Handan	9.2	800	2.0	11,900
Xingtai	7.1	600	0.7	6,000
Henshui	4.3	500	0.4	11,800
Outer Jing-Jin-Ji	31.0	600	6.5	12,500
Jng-Jin-Ji	109.2	500	44.6	5,900

Population in millions.
Jurisdition population from government sources
Urban area population from Demographia World Urban Areas

The size of China's urban clusters is unprecedented (Beijing Tianjin Hebei cluster already includes about 110 million people)

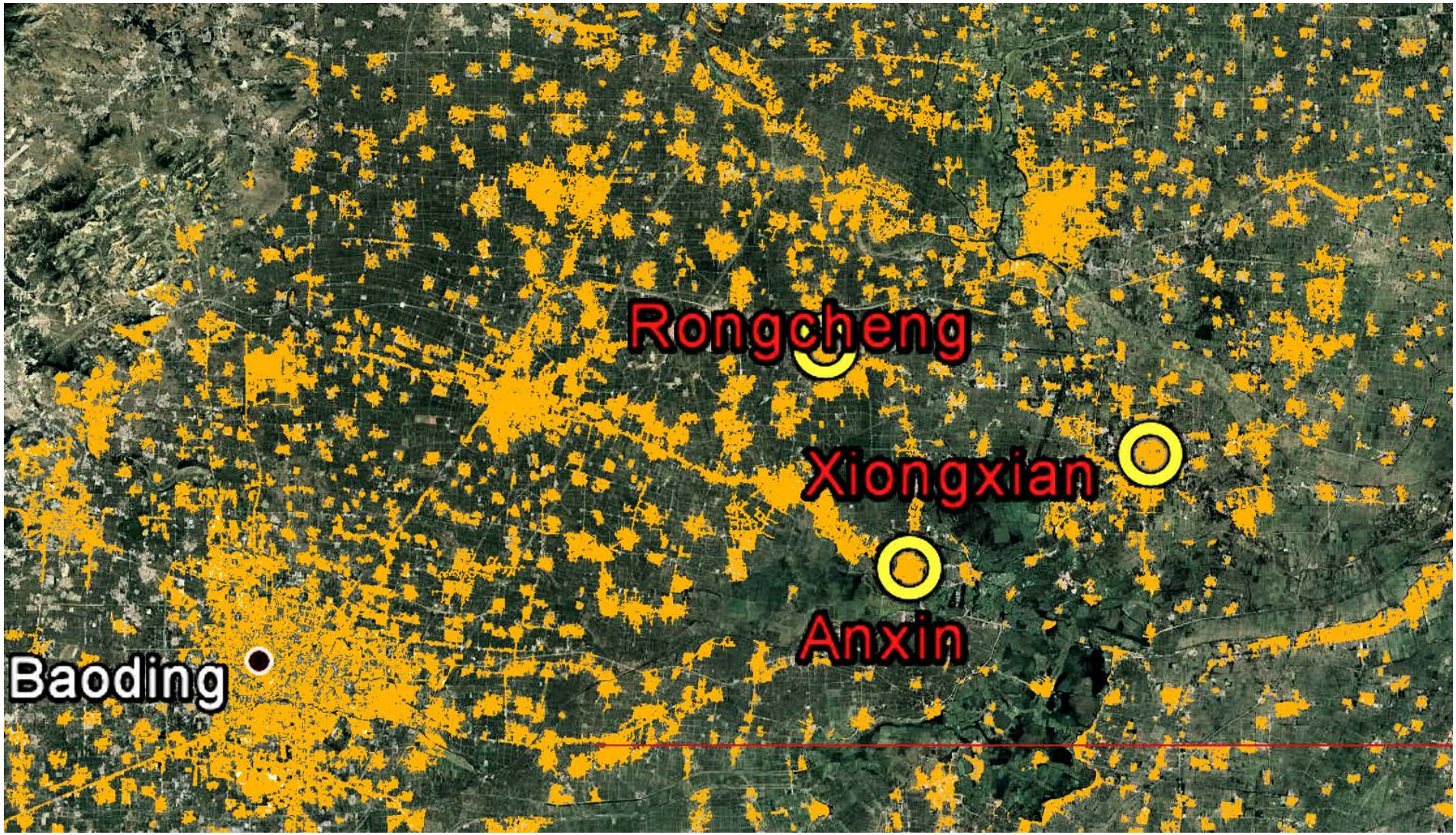


In urban clusters, the spatial pattern of population densities and job distribution is already very different than in more traditional forms of urbanization

The new area of Xiongan is under development

Economist.com

Existing settlements in Xiongan new area being currently redeveloped as part of Beijing-Tianjin-Hebei



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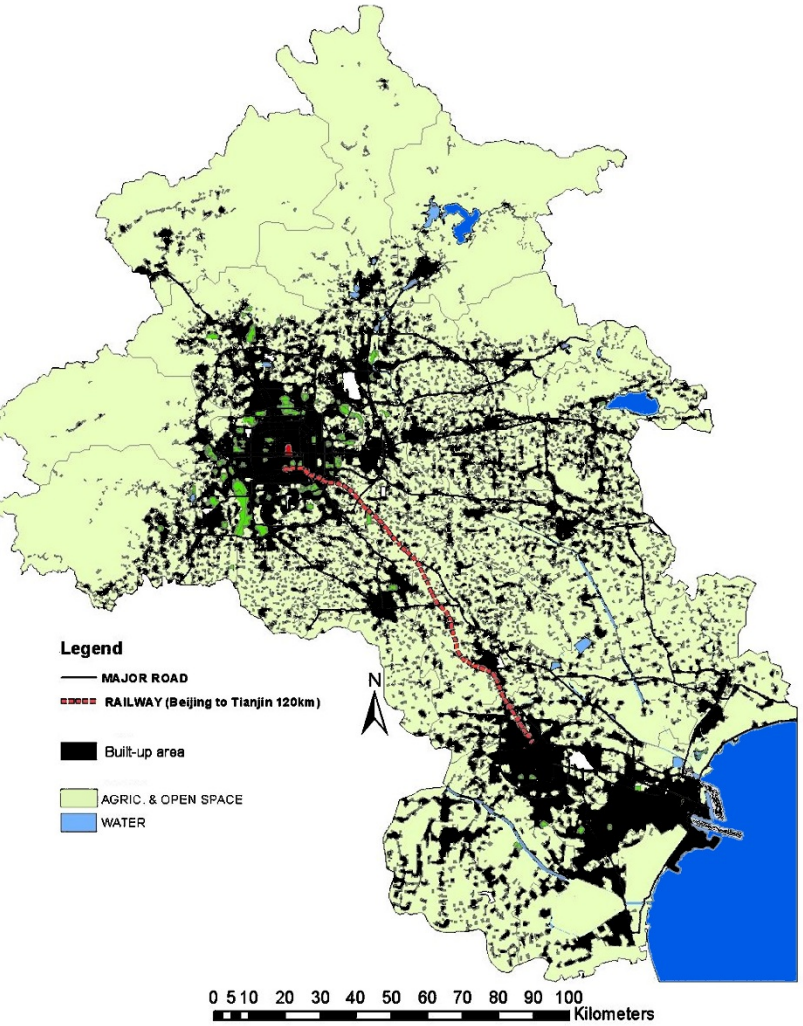
The size of China's urban clusters is unprecedented in the history of urbanization

China's urban clusters are dwarfing traditional existing megacities

Beijing-Tianjin shown at the same scale as Seoul and Paris metropolitan areas

BEIJING & TIANJIN BUILTUP AREA - 2013

Total population in areas shown on map: 36.5 million (2010 census)

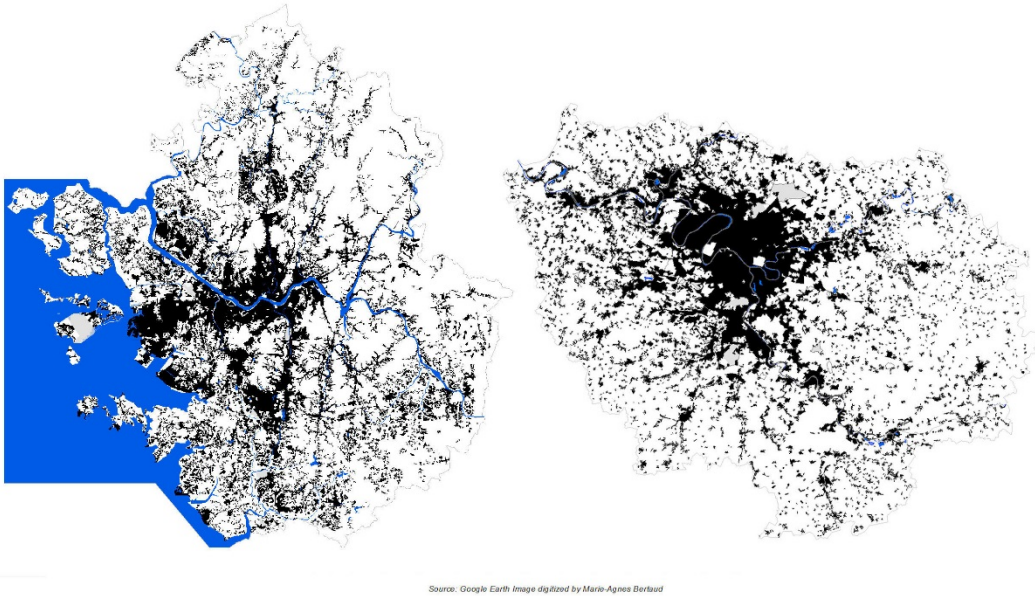


Seoul Metropolitan Region

Built-up area 2009 : 3,028 km2
Population : 24.8 million
Built-up density : 82 p/ha

Paris - Ile de France Region

Built-up area 2006 : 2,871 km2
Population : 11.66 million
Built-up density : 41 p/ha



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The capacity of future urban transport to integrate in a unified labor market the large population of China's urban clusters is the main unresolved issue

1. The combination of transport modes currently used in large metropolis seems to have reached its limits

2. Current transport modes will be unable to provide the connectivity required to integrate labor markets of more than 60 million people

Beijing subway system, one of the most modern and largest in the world, is already saturated at rush hour

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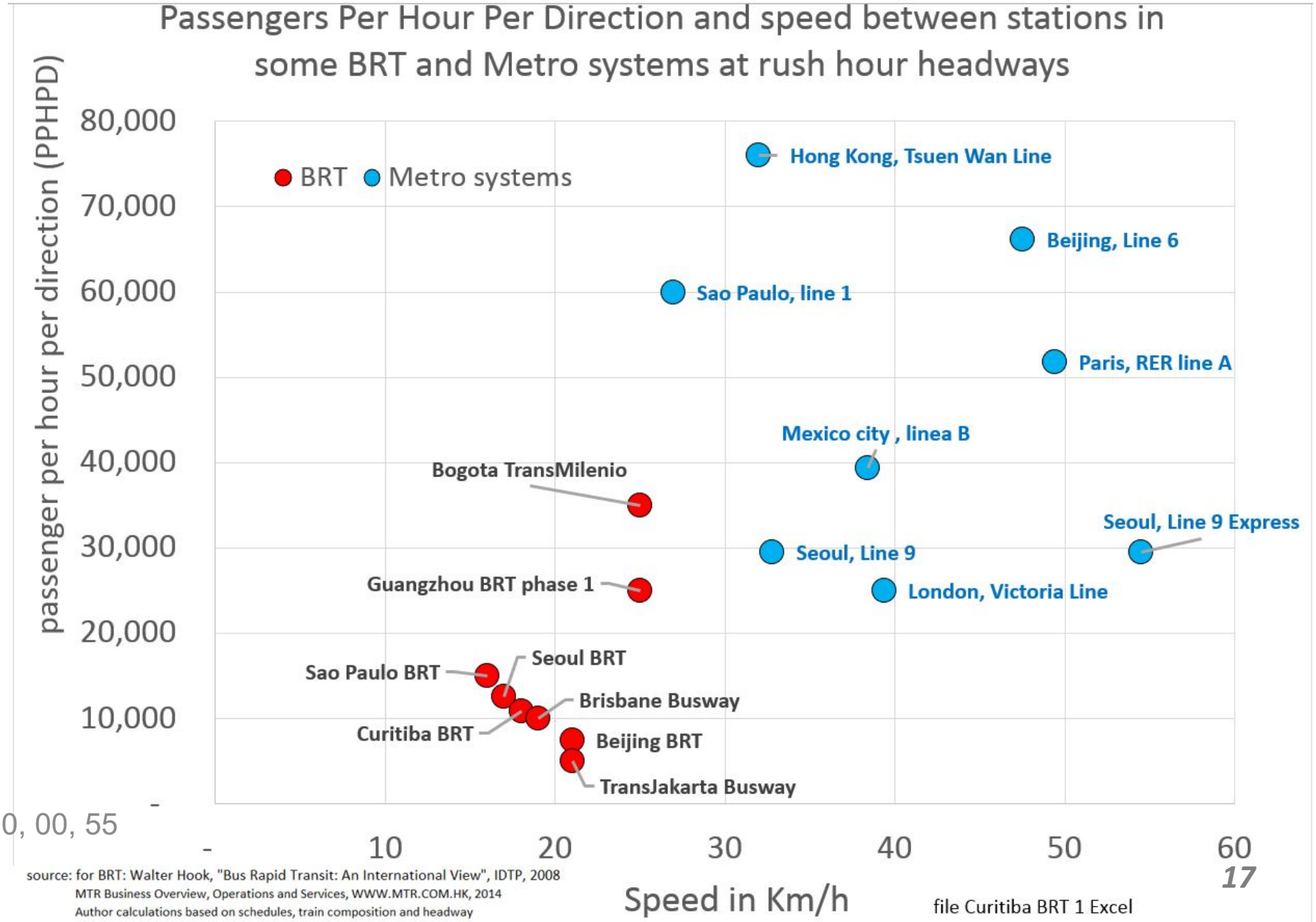
Source: Beijing Transport Research Center (2015)

The fastest forms of current modes of transit will be too slow to integrate the labor markets of large China urban clusters

The faster transit systems seem to have difficulties breaching the 55km/h speed barrier



source: for BRT: Walter Hook, "Bus Rapid Transit: An International View", IDTP, 2008
MTR Business Overview, Operations and Services, WWW.MTR.COM.HK, 2014
Author calculations based on schedules, train composition and headway

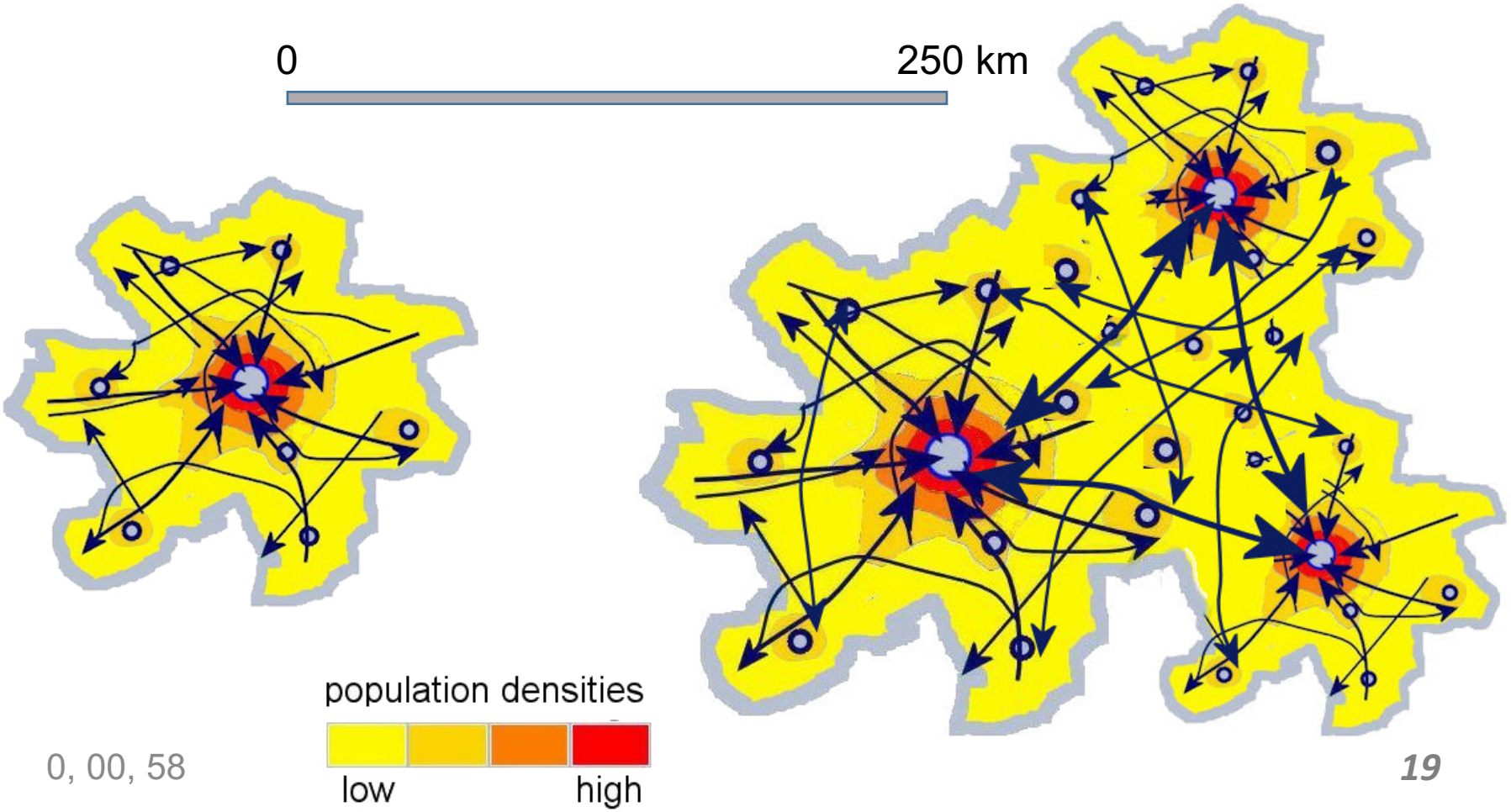
file Curitiba BRT 1 Excel

Given the current urban transport limitations,
can China develop new urban transport systems that will be able to integrate labor markets much larger than the ones already existing in megacities?

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



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Very fast mode of rail transport will have to be combined with rapid access to and from stations to final destination (door to station, station to door)

(The Maglev train linking Pudong Airport to Shanghai city center)

Individual modes of urban transport providing door-to-station and station-to-door trips will have to be invented

Fast trains linking high density clusters would have to be associated with fleets of shared small individual vehicles for trips covering the first 5 km from trip origin to stations and the 5 km from station to final destination

This fleet of vehicles already exists in a primitive form around some suburban Beijing subway stations

Small footprint shared electric vehicles fleets already operate on an experimental basis next to some suburban rail stations in Japan and Europe

The Lumeneo Smera is available now in Paris

Toyota's i-ROAD is a fully-enclosed, two-seater, three-wheeled, fully-electric, Personal Mobility Vehicle (PMV)

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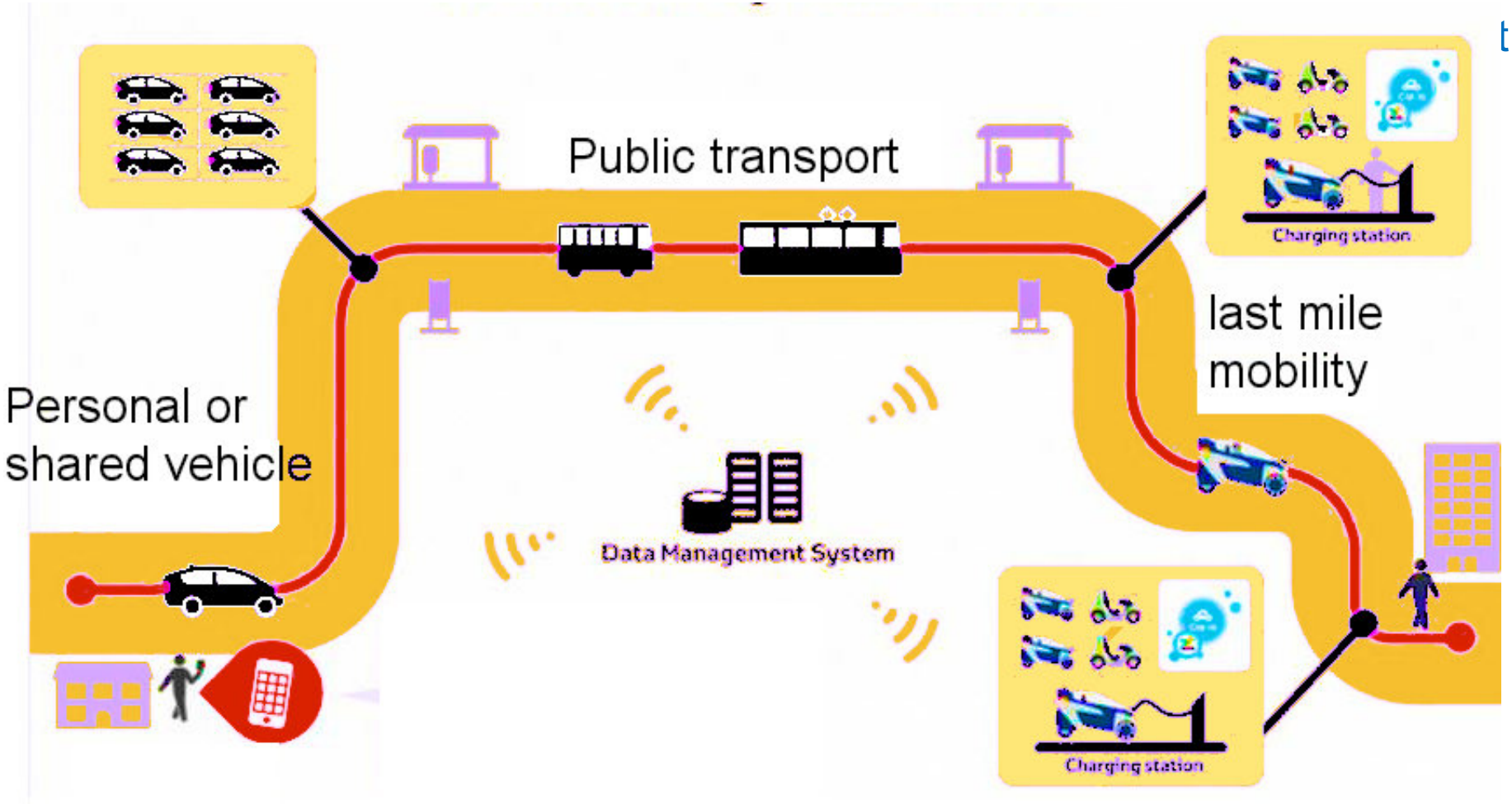

Toyota supplies 70 COMS and i-Road electric vehicles and "Last Mile Mobility Management System" to manage interconnection between users, vehicles, charging stations and the web-based Station Mobile trip planner

Toyota i-Road personal mobility vehicles parked near rail urban transport station in Grenoble

http://www.toyota-global.com/innovation/personal_mobility/i-road/

Self driving cars would be adequate for the first and last 5 km to and from stations in very large urban clusters

The size of China's urban clusters could usher an unprecedented new era of urban productivity and creativity

China has already a good tract record in developing rapidly new urban infrastructure

The final success will depend on the ability to develop new form of transport needed to integrate labor markets of hundred million of people