The Influence of Interactions between Urban and Transportation Planning through the Transforming Structures Of Chinese Big Cities.

How to Integrate Current Decentralized Concentration and Urban Mobility Management ?

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Introduction

The successive phases of urbanization have consistently been influenced and shaped by the mobility of people and goods that generate economic and social activity of a city.
In China, the unique relationship between city and mobility is very instructive, particularly since the period of reforms in the late 70's.

Several steps of transformation of the Chinese city and its mobility facts have led today to a complex management of urban growth and a diversification of inner trips.

After reaching a critical size that implicates the challenge of sustainable mobility, many Chinese cities are now faced with a difficult equation relating population distribution, urban functions and the impact of trips length and modal choices.

This paper introduces the evolution of urban transformations and their interactions with the travel-behaviours. It focuses then on the future potential for a more harmonious relationship between transport and city in the Chinese context.

Two aspects of the urbanization process will be faced and correlated:

- The extension and diversification of urban trips
- The multiplication of planned or informal subcenters, constructing a specific polycentric urban pattern in China since 3 decades.

Urban mobility since 1949, 4 phases of deep transformation: from simple patterns to complex interactions

Phase 01: Bike Oriented Cities and communities through collectivism (70s to 80s)

Since the ancient times, Chinese cities were always organized as a concentrated group of manageable units, seperated by walls or roads. Several of them, called “danwei”,
functioned as a complete and autonomous socio-economic unit, providing housing, employment and several essential services. During the collectivist period, the distances between residence and workplace rarely exceeded one thousand meters. In this context, the bike was quickly erected as a symbol of the planned economy and collectivist society, shaping organization the urban and rural settlements.

The inherited pattern of the former Chinese cities was made by a juxtaposition of limited social and economic units. They were shaped by a « short trips oriented mobility » that has gradually disappeard with the improvement of living standards, followed by a new distribution of population and urban

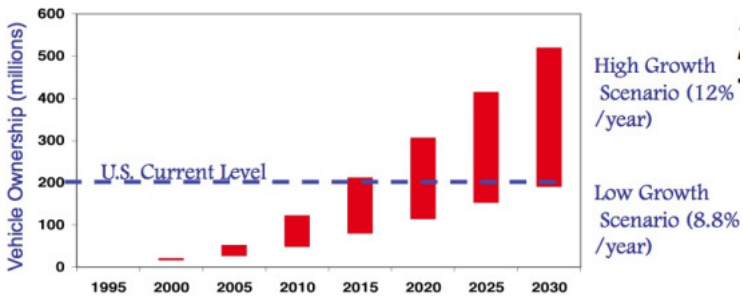
functions and by the emergence the private owned car.
These rapidly changing urban structures and mobility facts were initially heavily influenced and encouraged by the massive investments in the automobile industry, followed by the planned construction of large road networks, with Beijing as a first experimental field.

Phase 02: The emergence of Car Oriented Chinese cities (80s to 2000s)

Following the proactive development of automobile industry, the massive investments in urban road infrastructures coupled with decentralization of residential areas have created a fast growing COD model, generating an imbalance between growth of the number of cars and the ratio of urban roads, resulting in traffic congestion which is mostly concentrated on primary roads, due to the lack of secondary roads in the first phases of construction.

However, the priority to build road networks before achieving a metropolitan public transport network has seriously affected several important Chinese cities like Beijing, Wuhan, Guangzhou and Chengdu. In the context of rapid relocation of populations and urban activities, it was essential to guide the major trend of urban mobility. Unlike Tokyo, which had invested primarily in the railways before completing its infrastructure through a network of urban roads, cities like Beijing and Chengdu clearly prioritize the COD (Car Oriented Development) model and now face a difficult catch-up by completing their metro and bus networks.

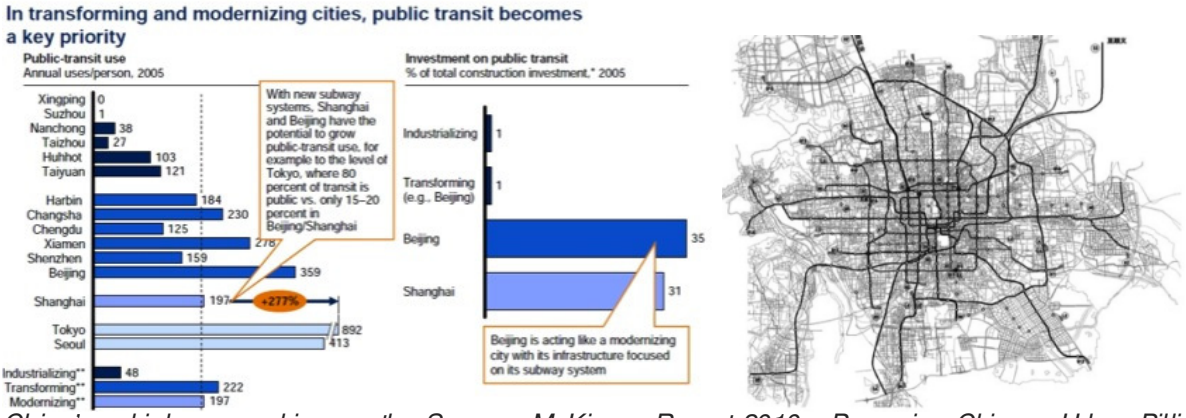
The inherited radioconcentric structure of Chinese cities created a hard challenge of traffic management despite the policy of decentralized concentration of urban functions. The COD model, which now dominates the structure of Beijing nevertheless continues to be superimposed by the former bike oriented urban layout through the hutongs networks that constitute a major force for future sustainable mobility at the level of communities and neighborhoods. One of the next challenges of the COD model will be the coordination of parking management and its organic pressure on public spaces.



China's vehicle ownership growth - Source : Tsinghua University, State Council DRC
Until 2030, China might reach 200 millions owned vehicles. The increasing urbanization ratio will introduce the challenge of motorized mobility inside cities through parking management, road capacity and intermodality with low carbon and slow modes.

Phase 03: Transforming cities meet the National Rail oriented strategy (2000 to 2010s)

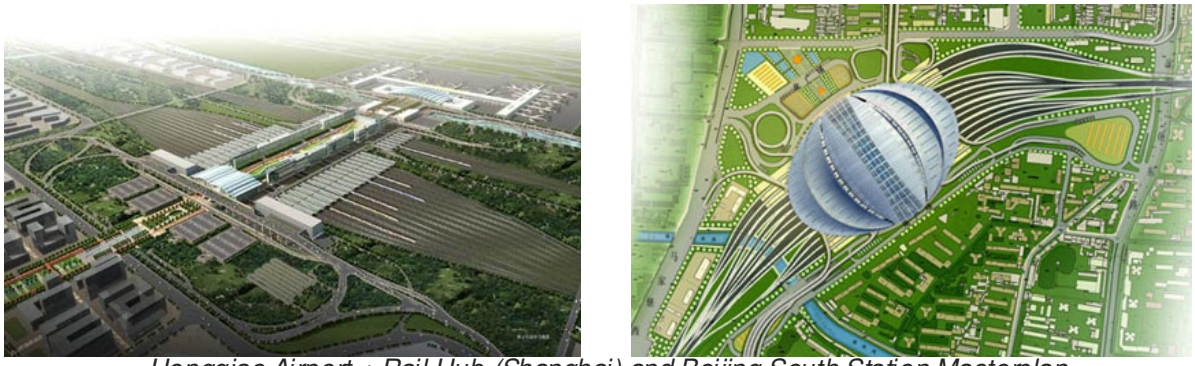
Gradually overtaken by the massive investments in light transit, the structure of COD Chinese city is now completed by a TOD (Transit Oriented Development) policy that is superimposed on the existing urban layout. Responding in part to the increasing diversification of urban trips, the new metro networks are being implemented for better connections between railway stations, Economic Development Zones (ETDZ), CBDs and peripheral newtowns resulting from policies of decentralized concentration.



China's vehicle ownership growth - Source : McKinsey Report 2010 – Preparing Chinese Urban Billion – Transportation Comprehensive Plan of Beijing

The urban rail transit investments are transforming more and more urban structures with a growing influence on urban population's residential and employment strategies.
Investors and residents priorize first subway stations areas in terms of workplace, residence and leisure. The visible result can be described as emerging organic subcenters, made by real estate investments focusing on mixed-used developments, which are benefiting of subway connections and well-designed public spaces. They emerge now as the new landmarks of several Chinese cities, as Zhongshan Park in Shanghai or Zhongguancun Plaza in Beijing.

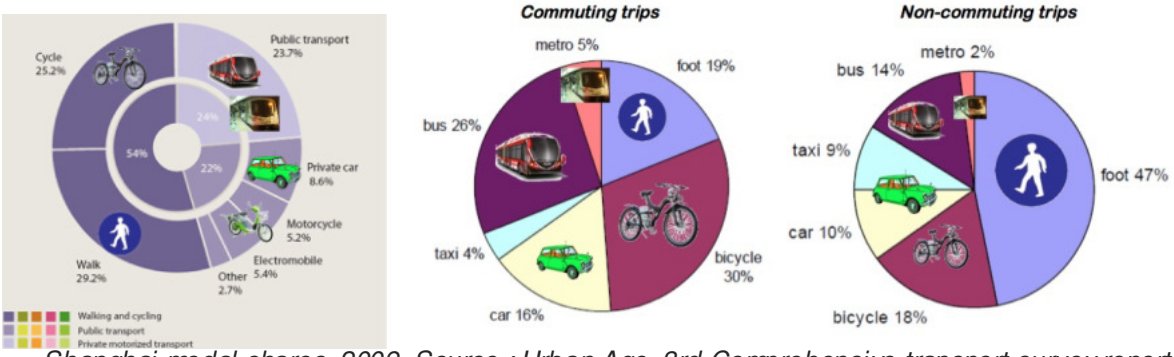
Furthermore, the recent policy of high-speed train network construction completes the redistribution of urban districts attractiveness by setting up new stations adapted to the requirements of metropolitan intermodality. Stations like Beijing Nanzhan, Shanghai Dongzhan (Zhenru) or Chongqing Beizhan are identified as the cores of new subcenters that will redraw the map of major trips. Hongqiao airport and train station is certainly the most complete intermodal station, which connects the airport with high-speed train, subway, and soon the Maglev, illustrating the model of the « high speed city" which is gradually appearing.



Hongqiao Airport + Rail Hub (Shanghai) and Beijing South Station Masterplan
The newly built stations and multimodal hubs are recent components that influence the redistribution and relocation of urban functions and activities, disturbing the former map of accessibility in Chinese cities.

Phase 04: Superimposition of slow and fast urban mobilities, the age of intermodality

These three first periods of transformation and adaptation of urban transport with correlated land use effects laid the foundations of the new Chinese urban structures, permanently influenced by car oriented policies and overtaken by the impact of investments in mass transit. Despite the growing congestion of urban road networks, the modal share of private cars in China remains below 10% and the slow mobility remains very influential, with eg 25% for cycling, 5% for e-bike and pedestrian 29% in Shanghai. There are actually two scales of urban mobility in cities: the metropolitan level, shared mostly by rail and car, and the local level, shared between the slow mobility and car.



Shanghai modal shares, 2009. Source : Urban Age, 3rd Comprehensive transport survey report

Downstream and upstream of the attendance of large multimodal hubs such as train and subway stations or park and ride, there is a local mobility (mostly pedestrians and cyclists) complementary to transit traffic, which plays a fundamental role in the efficiency of the mobility of a city. Faced with an increasingly complexity of daily trips on a wide range of levels, Chinese cities will face the challenge of the interconnection between these modes and take the necessary measures to reduce local congestion and carbon footprint of local mobility.
The fourth phase of urban mobility transition will be defined as an integration process of all modes of transport in which the government has invested one by one. This integration of transport modes will pass through land use management and urban planning.

2° Looking for a TOD polycentric model in urban China: a superimposition of subcenter patterns and trip-behaviour changes

The paper focuses on the influence of planning on urban transport and will highlight the emergence of a Chinese polycentric model that invevitably interacts with travel-behaviours and patterns of mobility.

The critical size of Chinese cities leads unambiguously the appearance of new subcenters that play their role as complementary cores with the central city.

The increasingly multipolar nature of Chinese cities is the result of their spatial and demographic growth, but also of the "decentralized concentration" policy, completed in the central cities by the emergence of new organic or planned subcenters.

The concept of polycentrism is complex, since it does not specify the scale of the multipolar structure. In the case of Shanghai, bridgehead of the Yangzi river megadelta (Shanghai-Wuxi-Suzhou-Kunshan-Nanjing), the Comprehensive Plan of the Municipality (1999-2020) provides an urban structure based on « 1-9-6-6 » planning concept that identifies one Inner City, 9 New Cities (+ / - 300,000 inhab.) 60 newtowns (50 to 100,000 inhab.) and 600 villages (2000 inhab.)

Source : Comprehensive Plan of Shanghai Central City (1999-2020)

Corresponding to 1-9-6-6 project of Shanghai, the policy of decentralized concentration of Chinese cities aimed to undensify the central urban areas and balance the population pressure on major cities such as Beijing, Shanghai, Guangzhou, Chongqing, Chengdu and Wuhan. In some cases, newtowns suffering from a lack of attractiveness and accessibility have not played and assumed a key role in the balance of urban spatial functions, becoming poorly connected mono-functionnal residential areas (eg Songjiang Newtown in Shanghai.)

The increasing number of new clusters within the inner cities has much more influence in the redistribution of activities and daily trips. Planned or organic, these new subcenters are the successive products of urban and economic policies of the past 30 years. We identified four major forms of new urban centers that dominate the redistribution of metropolitan functions and influence the urban mobility:

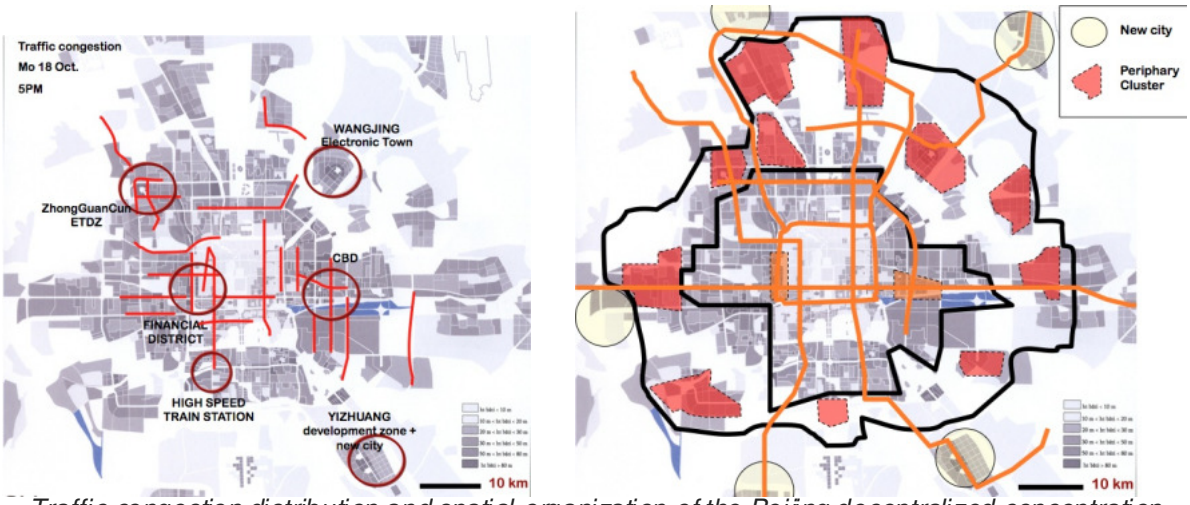
1. Planned Economic and Technologic Development Zones (ETDZ)
2. Planned CBD
3. Organic or planned SubCenters
4. New train stations, developed in the frame of the national high-speed rail network project

To understand the ability of these new centralities to influence the trajectory and length of trips, it is interesting to compare the Municipalities of Beijing and Shanghai, which have neither applied the same planning policies nor experienced the same growth of number of cars.

1. *Beijing: the radioconcentric car oriented city*

Experimental area of central government's urban planning policy, Beijing is also one of the cities where the development of the automobile industry has been most encouraged, generating a significative growth of the number of cars, while the urban road capacity couldn't absorb it.

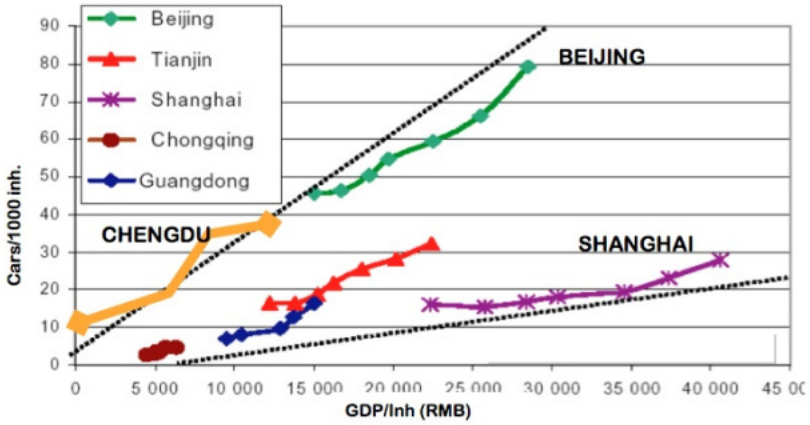
The inherited radioconcentric structure materialized now by 6 ring roads seems to be in conflict with the decentralized concentration policy based on 7 New Cities and 9 outer periphary clusters around the central city, beyond the fourth ring road. The development of these new areas is stimulated by the introduction of high-tech parks and development zones intended to decentralize economic activities in the city. This type of spatial planning aims basically to provide a better balance of traffic flows and to reduce congestion.



Traffic congestion distribution and spatial organization of the Beijing decentralized concentration – Source : S.Goethals mapping analysis, 2007

In the case of Beijing, the decongestion of traffic through decentralization has faced major obstacles from municipal policies:
- Lack of investment in light transit connecting inner city and newtowns.
- Maintaining a radioconcentric road network, made of radial and ring axis forming a grid without any tangential and transversal connections.
- The growth of owned cars without any ability of the road network to absorb it.
- An insufficient decentralization of business cores, coupled with the increasing of mono-functionnal residential areas instead of the planned mixed-used periphary clusters.

In the latest Beijing Master Plan (2004-2020), urban transportation pattern and its infrastructure network were defined as shaping components of the metropolitan spatial structure, in the continuation of « 2 urban axis, 2 development corridors and 1 polycentric structure ». In spite of the intentions since 1998 to develop a 400 km light rail network through a polycentric metropolis, the consequences of the former policies that encouraged the use of own cars by priorizing car industry and highway network construction will be sustainable in such urban structure.



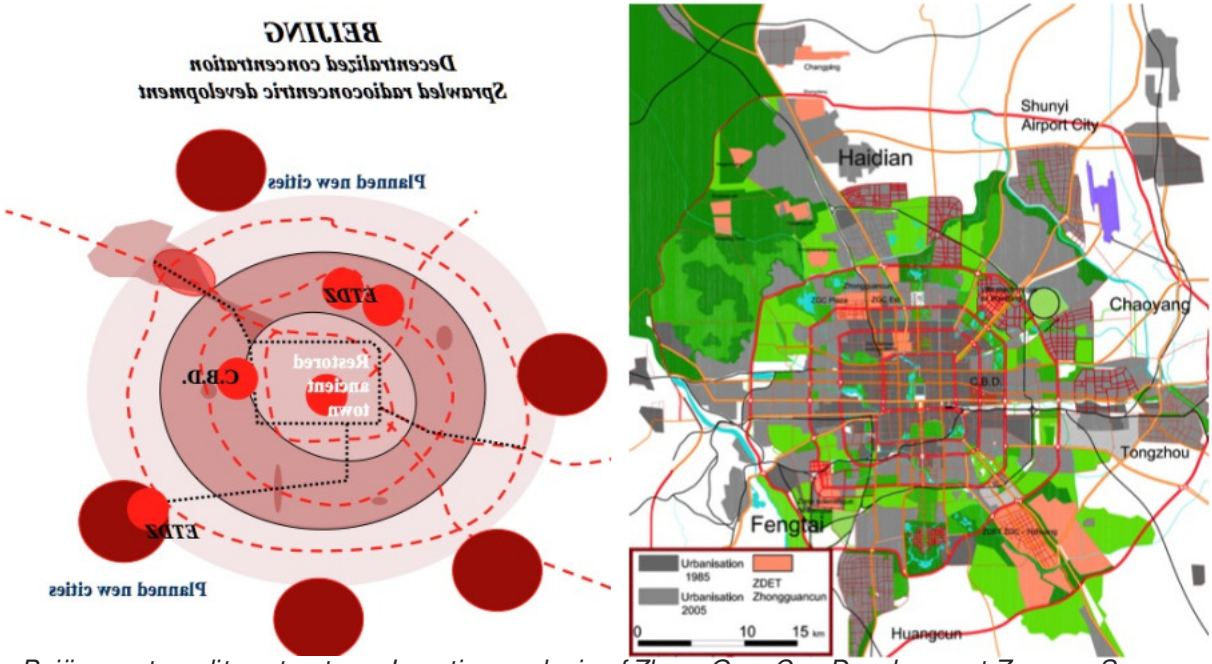
Relationship between car ownership and GDP per capita - Source : China statistical Yearbook (1995-2007), Julien Allaire

If we compare the growth of urban GDP per capita and car ownership/1000 inhabitants, we notice two different trends that are emerging in China. Beijing and Chengdu show a clear relationship between income growth and the use of private cars, strongly favoring the COD model. While car use in cities such as Chongqing and Shanghai have much more moderate relationship with GDP / capita. The observed trend in Beijing and Chengdu shows a threat of roads saturation linked to the radioconcentric structure of their road networks, limiting the tangential and diagonal connections necessary for the accessibility of new subcenters that are supposed to fluidize the central city.

With its radioconcentric road network and COD policy, the Municipality of Beijing applied the principles of decentralized concentration, with planned newtowns and High-tech industrial development zones, which increased naturally the average distances of commuters daily trips. The mistake was to combine planned decentralization and car oriented development, without any effective control on mono-functionnal housing development in some huge areas and without any ambitious short term public transportation network development.

Indeed, uncontrollable housing development fundamentally influenced the urban structure and daily transportation commuting patterns. Most of planned periphery clusters became mono-functionnal residential areas, only connected to the Central city by car or bus. Lot of them are still waiting for a light rail or BRT connection. Their location and major function consolidated until today the mono-centric urban structure of Beijing.

Nevertheless, several successfull subcenters have been achieved in the Beijing Inner City, in some innovative ways, like the ZhongGuanCun multipolar network of Economic and Technologic Development Zones, dispersed from Haidian district to Yizhuang Newtown. Planned ETDZ are not transit oriented since the first phase of their planning, but their location was very strategic (beside university campuses) and they integrated well the current light rail network and are connected to the CBD of Chaoyang.



Beijing metropolitan structure ; Location analysis of ZhongGuanCun Development Zones – Source : S.Goethals, mapping analysis, 2007.

Despite its monocentered radioconcentric scheme, Beijing spatial growth is planned as decentralized city, influenced downstream urban planning by investments in Economic and Technologic Development Zones (ETDZ.)

The biggest challenge to achieve a polycentric city in Beijing seems to be the integration of the outer city's clusters into the metropolitan economy, in place of mono-functionnal residential areas. But we observe that the policy of decentralized concentration is not able to achieve a sustainable mobility in Beijing if the use of owned car is encouraged like these last 20 years.

2. *Shanghai: the ingredients of the "high-speed metropolis"*

The introduction of the 1-9-6-6 concept in the Comprehensive Plan of Shanghai counted the existence of 60 towns and 600 villages around the city-center, highlighting both the hierarchy of administrative entities that structure the Chinese territory. The inner city districts themself are actually split into neighbourhoods (Jiedao) and residential communities (Jumin weiyuanhue), which allows an accurate identifying of all the social and economic communities that compose the city, corresponding for most of them to urban blocks.

9 planned New Cities are gradually connected to the planned subway lines of the Inner City. But the remoteness of these new cities coupled with a stretched urban subway network poses problems of commercial speed, due to the large number of stations that separate the new city from the Inner City on one transit line.

Unlike a city like Paris that distinguishes its subway network from its suburbs trains, Shanghai has built an entire centralized network for both inner city and suburbs without any tangential connections. The case of Songjiang illustrates the problem of transit accessibility of its inhabitants. On the one hand, the urban layout of Songjiang is made by large blocks containing residential communities designed as compounds.
On the other hand, the terminal subway station of line 9 eccentric to the newtown, is imposing the use of car upstream the use of subway, accentuating the feeling of low accessibility of Songjiang to the central city, and weakening the attractiveness of new cities in terms of residential and business location strategies. Like the outskirts of Beijing, Shanghai suburbs seem to become car oriented, while the central city remains diversified modal shares.

The urban layout of the Shanghai Inner city is now a complex nesting of residential communities organized in « Xincun » (« new villages ») or former « lilongs » inside large urban blocks. Beside the traditional urban layout appear new apartments blocks, high-rise compounds and commercial centers that become the new vital cores of neighbourhoods.

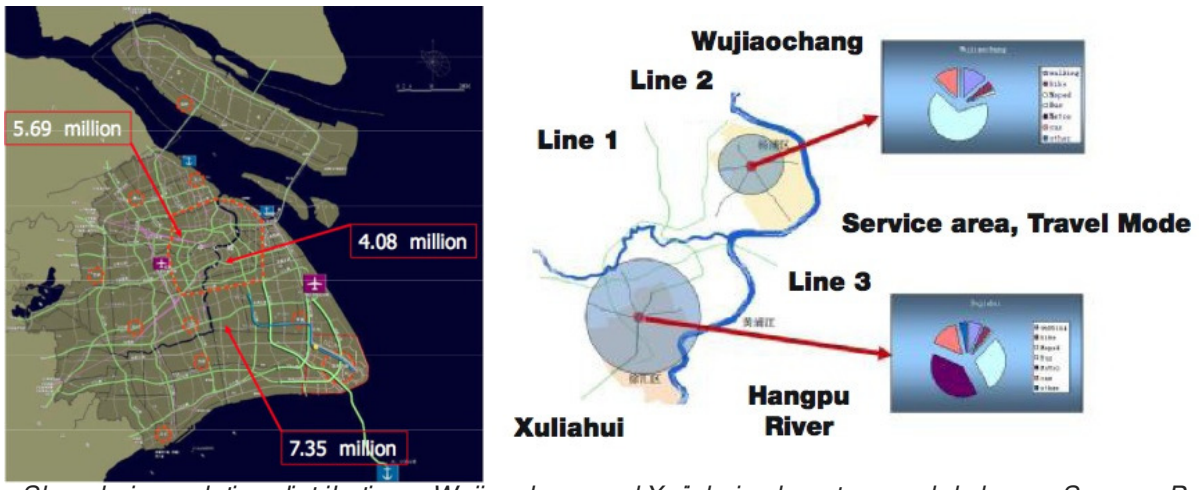
On the plan, Shanghai seems like a vast grid of large closed urban blocks. The distance between two crossroads (800 to 1000 m) encourages transit traffic and speed, while complicating the use of slow modes by the lack of direct connections between origin and destination.

Shanghai Inner City suburbs – Comparing Shanghainese urban blocks size with 5 other world cities. Source : Urban Age

However, these large blocks represent a huge potential for local sustainable mobility, since they mostly contain internal networks of paths only accessible to pedestrians and bicycles (some of them are also used as residential parking for cars.) In the case of Yuyuanxincun, near Metro station Jiangsu Lu (lines 2 and 11), the vast city block contains several Xincun (new villages) providing an internal network of paths combining bicycles, pedestrians and outdoor + indoor commercial activities. These internal networks, sometimes closed or privatized, are still a tremendous potential for local slow mobility upstream and downstream the long distance trips. The ubiquity of shops and local services also encourages short trips for shopping and leisure especially.

Networks of paths inside Yuyuanxincun block, in Jiangsu Lu station area. Source : ditu.baidu.com, S.Goethals

Deconcentration of activities seems rather to be successful within the Inner City, 20 years after having planned 4 subcenters. Today, two successful metropolitan subcenters (Xujiahui, Wujiaochang) are polarizing some variable parts of the Shanghainese population. The two other planned subcenters (Zhenru and Huamu) suffer of a lack of coordination between housing development, and public transport accessibility.



Shanghai population distribution – Wujiaochang and Xujiahui subcenters modal shares. Source : Pr PAN Haixiao, Tongji University

In 2008, a survey made by Tongji University and Pr Pan Haixiao showed that 70% of people took public transport to reach both Wujiaochang and Xujiahui. 41% of them reached Xujiahui by metro and 32% by bus. Before 2010, Wujiaochang was only accessible by bus, before the construction of metro line 10, linking the central districts to Yangpu in the North. This difference of accessibility showed the difference of coverage area of both subcenters. Xujiahui is much more attractive, due to its central

location and its connection to the metro network, while Wujiaochang was not really integrated in the central metropolitan area because of its unaccessible position. The weakness of Xujiahui is about comfort of pedestrians once they go out of the metro station and try to reach their destination. Xujiahui is made by commercial buildings disconnected by large roads and suffering of poor location of pedestrian bridges, while Wujiaochang was designed as a central square able to distribute easily pedestrian flows to each of the five urban blocks without any conflict with car traffic.

Beside these two subcenters, Zhenru seems to be the next ambitious subcenter to be achieved, thanks to the Shanghai-West train station, that will play a new role in the national railway network. National, regional and metropolitan levels of intermodality around the station are strategic components of a successful subcenter, as Hongqiao airport+ station is demonstrating it today.

Optimizing a metropolitan urban structure to reach the objective of sustainable integrated mobility seems to be partly dependant of polycentric strategy and its degree of coordination with the public transportation.

3° Learning from abroad : 4 cases of benchmarking to integrate better city and mobility

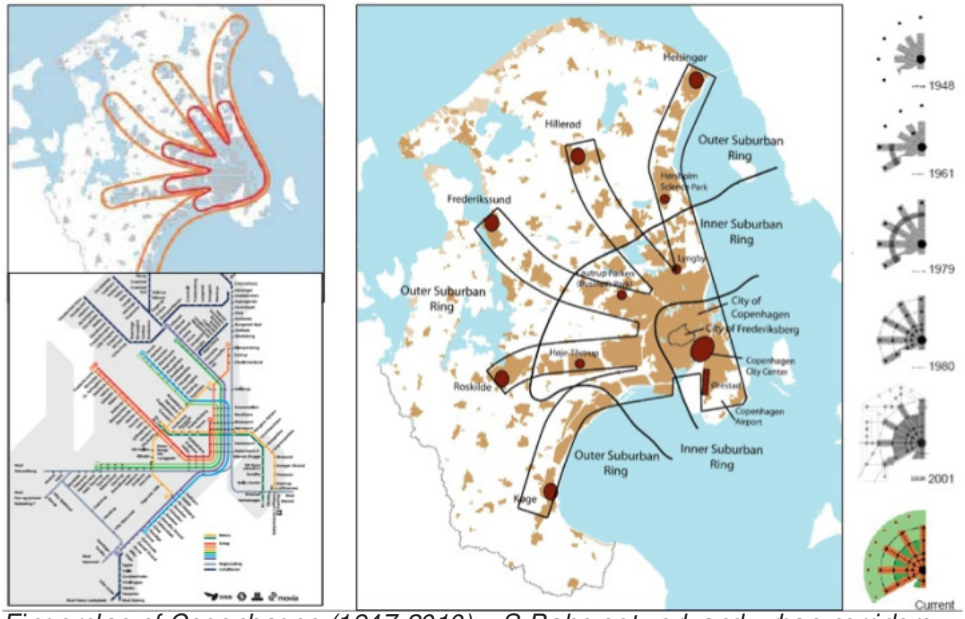
Coordinate Transit Oriented Development and Polycenter planning to reach a coherent and fluid urban mobility in Chinese big cities seems to be an incomplete measure when we observe the cases of Beijing and Shanghai.
Might current urban China import some successful TOD polycentric models from abroad?

Some European and Asian cities have succeeded to implement coordinated planning models and their policies seem to be not negligible in the context of China's urbanization.

The case of the City of Munich (3,000,000 people) in Germany is very eloquent. The Municipality developed a coherent transport policy that follows the Plan "Kompact, Urban, Grün" (Compact, Urban Green.) This plan proposes a polycentric development by identifying moderate compact subcenters to be developed around some existing subway stations within a radius of 800 meters. The most innovative aspect of this vision is to coordinate slow mobility encouragement and deconcentration of metropolitan functions. Starting from a TOD policy, the City of Munich plans its subway stations as multimodal hubs made for bicyles with the achievement of 28,000 « Bike and Ride » parking spaces. Bicycle lanes are planned and designed all around the metro stations, some of which are at the heart of new subcenters. The metropolitan bicycle mobility plan, exploiting green corridors and complete networks of bicycle lanes, complete the successful intermodality between transit and slow mobility.

« Kompact, Urban, Grün » Comprehensive Plan of Munich – Bike and Ride facilities

The City of Copenhagen has also succeeded to combine TOD planning and local low carbon mobility, through its Fingerplan since 1947. Organized in limited urban development corridors along the S-Bahn lines, Copenhagen urban growth was managed to promote alternative modes in the central city and its suburbs. Ishoj station is connected by a network of pedestrian and cycling lanes within on kilometer radius without any contact with the road network.



Fingerplan of Copenhagen (1947-2010) – S-Bahn network and urban corridors

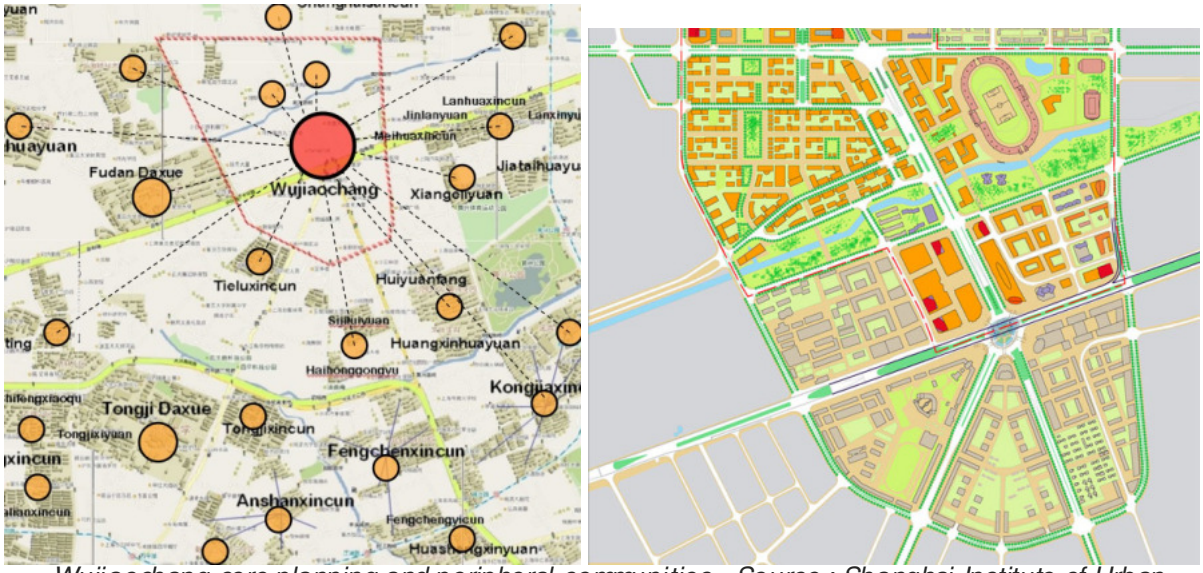
Closer to the scale of Chinese cities, Tokyo bet since the beginning of its planning after the Second World War on the rail-oriented development, with the North-South Yamanote bypass line, connecting 9 metropolitan subcenters to the city centre. More recently, one East-West bypass subway line complemented the TOD model and allowed the construction of new decentralized subcenters.

The combination of real estate investment and light rail infrastructure is another TOD application, developed by Hong Kong transport public company itself by combination of High-rise real estate investments and strategic subway network development.

Without going deeper into these cases of benchmarking, it is questionable whether the Chinese cities can benefit from these varied experiences, and how these applications can improve or rationalize mobility across the metropolitan scale on the one hand and across the neighbourhood scale on the other.

4° Focus on Wujiaochang subcenter in Shanghai, where urban planning meets mobility

The coverage area of Wujiaochang subcenter in Shanghai is defined as a criterium of success of the planning strategy of the Municipality. Far away from the hypercentre (10 km on average), Wujiaochang is now connected with the metro line 10, but is still described as a decentralized area. The success of Wujiaochang, made by ambitious investments and projects, as the Wanda Plaza pedestrian streets and the Knowledge and Innovation Centre (KIC Village), is mostly due to its strategic location (nearby Fudan and Tongji universities) than its accessibility by light rail or road.



Wujiaochang core planning and peripheral communities - Source : Shanghai Institute of Urban Planning and Research

But the public transport coverage area is not the only ingredient of attractivity. Under the "motorized coverage area", we can also define a "non-motorized coverage area", dependent of comfort for slow mobility and intermodality between pedestrians, bicycles and public transport. This "non-motorized coverage area" can be optimized by urban design to encourage local slow mobility in the area.
Once we understand this notion of attractivity for slow mobility, we can compare in a different way Wujiaochang and Xujiahui.

In one hand, Xujiahui is a very attractive area due to its optimized accessibility by metro. But, once we have reached the metro station, the pedestrian (and bike) accessibility to the destination points around the area is harder, due to obstacles, like the huge crossroad of metropolitan ways, and poor location of pedestrian bridges.
The 10-minuts walking area of Xujiahui area is actually very limited, and the size of the attractive subcenter area cannot be enlarged.

In the other hand, Wujiaochang is very decentralized, despite of his recent metro accessibility. The strength of this subcenter is to be a node of pedestrian connections that reach very easily every new urban functions. The size of Wujiaochang "10-minuts walking area" is potentially much larger than the area of Xujiahui and encourages local slow mobility.

If we trust the current development of Wujiaochang as a new metropolitan hub for next decades, we wonder if this subcenter will be able to bring some new ways of encouragement of slow mobility, complementary to the public transport at metropolitan level.

Some interesting exercice is to analyse the urban layout around Wujiaochang, and look at the trends of mobility inside blocks and residential communities.

The urban layout of Yangpu district is characterized by a majority of Xincun (new villages) that have all their own networks of paths. Inside urban blocks, many pedestrian and bicycle shortcuts are exploitable to complete the road network and build a slow mobility plan for the area.

Nevertheless, these inner paths are also threatened by several current trends, as the progressive privatization of urban blocks paths and their increasing role of residential car park. The community of Chifengxiaoqu (nearby Tongji university) is designed with 4 inner streets for local car traffic and 8 pedestrian axis. Since 2006 to 2010, the dedicated space for residential car parking has increased of 45%, and has divided these inner streets in two bands, one for parking and the other one for car, bicyle and pedestrian local trips. Once these inner streets are saturated by car parking, the pedestrian axis are the next areas to be targeted.

Chifengxiaoqu residential community paths, Chifeng Road, Yangpu District, Shanghai.

Car parking management will be one of the future big challenges of urban mobility in China. Today, the saturation of inner public space of residential communities has to be managed at the commitee level. Furthermore, urban blocks contain inner networks of paths that can become the ingredients of local coordinated slow mobility encouragement, but the incompatibility between the quiet atmosphere of community public spaces and their potential function of slow mobility corridor could curb such vision.
Beside this potential scenario, Wujiaochang subcenter keeps all the opportunities to implement a low-speed mobility system, like the project of "Wujiaochang light city" concept, proposing some 'light connections" between Wujiaochang, Jiangwan CBD and Tongji and Fudan Universities. One "green line" designed for low carbon mobility is yet created between both campuses of Fudan and Tongji, through their sport facilities.

5° Metropolitan-scale TOD + Community-scale SOD (Slow Mobility Oriented Development) : introducing the pattern of "urban connectivity"

Coordinate planning and mobility therefore seems indispensable in the context of growing Chinese cities.The "city size effect" on travel behaviours can be treated with a strategic location of several TOD subcenters which need a sufficient coverage area of attraction to be successfull. This attractive coverage area can be evaluated in a radius of 10 minuts light rail trip.
This kind of planning measure has to be completed at local scale by the management of the "urban block size effect", which has a dramatic influence on local modal shares. In this case, public space and road design has an important role to play and can encourage or not the pedestrian and bike modes. Pedestrian accessibility is determining the spatial limits (and partly the economic attractivity) of the subcenter, and is completing the transit accessibility, which is determining the spatial limits of his attractivity area.

Becoming a transport hub mixing pedestrian, bicycle, metro, car and taxi use, the subcenter core can play a role of integration of all modes of transport. As we saw in Munich, metro stations are integrating bike parking facilities, which encourage the intermodality between bike and metro. An optimized network of pedestrian paths in a radius of 1000 meters like in Copenhagen is another element to encourage the low carbon mobility downstream the public transport use.

Low Carbon Hub intermodality services – Location of potential hubs to be developed around Jiangsu Lu metro station. Source : S.Goethals, 2010.

Actually, the adapted tools to manage and improve slow mobility upstream and downstream a transit hub exist, but need to be integrated. Upstream the use public transport, bicycle can be used as a private vehicle, and parked in a Bike+Ride facility. Downstream the use of public transport use, other solutions exist, as the shared municipal bicycle, through a ticket fare integration with metro or bus. A subcenter core or a transit hub can be defined and managed as a "destination point", which distributes its inner fluxis in its local coverage area.
While the urban block or the residential community (Xincun, xiaoqu, etc.) can be defined as an "origin point", with an integrated management of car and bicycle parking and some innovative solutions to improve car-sharing, community shared bikes and collective trips.

We could call this model of urban mobility and parking management the "urban connectivity", coordinating commuting and non-commuting trips, motorized and non-motorized modes with multimodal nodes at different levels and located both at the main origin and at the destination points of trips, exploiting the hierarchy of Chinese urban administrative units (from districts to residential communities) to manage it at metropolitan and local levels.

The coordination between urbanism and transport in such big cities at several levels can be a first start of integrated management of urban mobility in China, but the car oriented decentralization that impulsed the development of huge mono-functionnal residential areas far away from inner cities represents the biggest challenge of future urban mobility. Because of the size effect of Beijing and Shanghai, their new cities are disconnected of the inner city and its urban economy. This situation suggests a scenario of progressive economic autonomy of new cities, that should be able to attract both residents, and employment in tertiary and secondary sectors by developing a diversified local economy, in permanent relationship with the inner city economy.

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