Beijing- the Forming of a Polycentric Megacity

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Abstract

Last century witnessed the increase of metropolitan regions and much attention has been paid on them. The concept of megacity appeared during the development process of metropolitan regions. Due to the rapid urbanisation and the population explosion in China, there are three main megacities which have great influence on the national economy. In this thesis, we choose one of the main megacities - Beijing megacity, as our case and the research question is how to strengthen the polycentricity of Beijing megacity to achieve more balanced development.

In order to find out the answers to the research question, the concepts of metropolitan region, megacity and polycentric megacity are discussed in the conceptual section of this thesis. The empirical section analyses the Tokyo megacity and Los Angeles megacity on purpose of finding the lessons and experiences that could be learned and applied to strengthen the polycentric characters of Beijing megacity. In the case study chapters, firstly we analyses the problems of monocentric Beijing municipality, then we suggest the approaches of being polycentric Beijing megacity where Beijing, Tianjin and Tangshan participate actively.

Key words: Metropolitan Region, Megacity, Tokyo megacity, Los Angeles megacity, Polycentric Beijing Megacity
Table of content

1. Introduction .......................................................................................................... 4
   1.1 The History of Chinese Urbanisation Development ................................................. 4
   1.2 Spatial Strategies in China ................................................................................ 7
   1.3 The Spatial Structure of China ........................................................................... 8
   1.4 The Purpose ....................................................................................................... 9
   1.5 Methodology .................................................................................................... 10

2. Metropolitan Region and Megacity – A Conceptual Analysis ............................. 12
   2.1 Metropolitan Region ....................................................................................... 12
   2.2 Megacity ......................................................................................................... 13
   2.3 Monocentric and Polycentric Megacities ............................................................ 15

3. Two Examples of Megacities ............................................................................... 18
   3.1 Tokyo ............................................................................................................... 18
   3.2 Los Angeles ...................................................................................................... 26
   3.3 Lessons from the Cases .................................................................................... 33

4. The Monocentric Beijing ..................................................................................... 38
   4.1 The Administrative Levels in China .................................................................. 38
   4.2 The Monocentric Beijing .................................................................................. 39
   4.3 The Polycentric Beijing Megacity ...................................................................... 48
   4.4 Advantages of Strengthening the Polycentricity of Beijing Megacity ................. 52

5. The Approaches for More Balanced Development of the Beijing Megacity ..... 57
   5.1 The Meaning of More Balanced Development of Beijing Megacity .................... 57
   5.2 The Functions of Beijing Municipality in Beijing Megacity ............................... 59
   5.3 The Approaches for Balanced Beijing Megacity .................................................. 61

6. Conclusion .......................................................................................................... 73
1. Introduction

Since the beginning of the 21st century, the change of the economic activities’ pattern and the urbanisation of many developing countries have been greatly influenced by the economic globalisation (Athukorala, P. and Menon, J., 1995), which has led to an increasing acknowledgement that metropolitan region has played a vital role in a country’s economic growth (Rostam, K., Jali, M.F.M., and Toriman, M.E., 2010). The metropolitan region has been instrumental in the national economic growth (Abdullah, A. and Pedersen, P.B., 2003). In the Europe Union, there are some acknowledged cases of the metropolitan regions, such as the Randstad in the Netherlands, and the Greater London in the UK. However, the different metropolitan regions have their different developing paths and modes; for example, the Randstad is a polycentric metropolitan region, while the Greater London metropolitan region tends to be more monocentric. With the continuing development of the metropolitan region, a new concept, known as “megacity”, has emerged since 2006. In China today, some cities, such as Shanghai, Guangzhou, Beijing, etc, can be classified as megacities.

1.1 The History of Chinese Urbanisation Development

The development of China’s urbanisation over the past fifty years has experienced huge fluctuations, which have been mainly affected by the changes of Chinese policies context.

-The foundation of People’s Republic of China (1949-1978)

The People’s Republic of China was established in 1949, when it had a total of 132 cities, with an urbanisation level of 10.65%, and 57.67 million people living in cities and towns. The 1950s witnessed the first wave of urban development in China, (Wang, G.T., 2010) when China followed the Soviet socialist planning
system and focused on the heavy industry, the development strategy in that period was known as the “Big Push”. In the period between 1949 to 1956, there was almost 30 million population forced to move from rural places to urban areas, then in the year 1958, Chinese government put forward the registered residential system, known as “Hukou”, to control the flow of rural population to urban areas, which still plays an important role in restricting the over rapid population growth in current Beijing metropolitan region. The planning and developing strategy in 1958 to 1961 was determined by the economic and social campaign called the “Great Leap Forward”, which was criticized by latter generations. The “Great Leap Forward” brought the initially growth of Chinese economy and another 30 million rural population to industrial areas, however, it also led to the huge catastrophe of China’s real estate. According to Dikötter (2010), approximately thirty to forty percent of all houses were tore to ruins, "homes were pulled down to make fertilizer, to build canteens, to relocate villagers, to straighten roads, to make place for a better future beckoning ahead or simply to punish their owners” (Dikötter, F., 2010). Then the ten-year Cultural Revolution came, from 1966 to 1976, which was the further fundamental shift in policy at that time. During that period, the economy activities and education system were brought to a halt. The government forced the youths and intellectuals to go to rural areas. As a result the urbanisation rate declined to 15.09% at the end of 1976.

-The economy reform (1978-1992)

In 1978, Chinese government began to shift its focus to the economic construction and a series of policies and measures were introduced to conduct economic reform. The Opening-up Reform made China connected with outside world closely, thus led to a high development speed of the national economy and urbanisation. At that time, China had more stable social and political
situations, due to a series of reforms in agricultural, industrial, fiscal, financial, banking, price setting, and labour systems. (Elisabeth J. P., and Christine W., 1985) However, the urbanisation rate in 1979 was 18.9% because of the Hukou system continuing to restrict rural migration to urban areas. The urbanisation in 1980s was mainly embodied by the shifts of rural settlements into small industrial towns. In the early 1990s, the urbanisation process was gradually accompanied by the big migration flows from rural areas to the fast expanding eastern coastal towns and cities. At that time, there was a policy came into place to “control large cities’ expansion, whilst promoting the development of middle and small cities and towns” (HGL, 2007). By the end of 1992, Chinese urbanisation rate had climbed to 26.4%, and the population living in cities and towns was still less than one third of the total Chinese population, according to figure 1.

![CHINA URBAN/RURAL POPULATION GROWTH 1950-2030](image)

**Figure1: the urban and rural population growth in China (GMT,2007)**

The new phase (1992 - now)

According to Gittings, the next phase of Chinese urbanisation started in 1992, when the reformist Deng Xiaoping visited Shenzhen. After that, the central government opened coastal cities, and all the capital cities of different provinces and autonomous regions in inland China. The local governments at different
levels made efforts to promote economic growth by attempting to attract Foreign Direct Investment. According to the National Bureau of Statistics, by the end of 2009, there were 654 cites in China, with 621 million inhabitants and the urbanisation rate was 45.6%. Among the 654 cites, there are thirty cities having a population of more than seven million and eight cities having over ten million inhabitants. During this period, the Hukou system still had a great impact on the urbanisation for it has “led to a special trait of Chinese urbanisation: decentralized and dispersed city clusters and fragmented city system.” (HGL, 2007) It also obstructs the needed emergence and development of metropolitan regions. As shown in the figure 1, the urbanisation rate has reached 47% in 2011 and by 2015 half of the population in China is expected to live in cities and towns.

1.2 Spatial Strategies in China

The *Five-Year Plan* drafted by the National Development and Reform Commission (NDRC) is the basic national economic and social development policy in China. This plan mainly serves to arrange the national large-scale construction projects, manage the allocation of productive forces and distribute the different sectors of national economy, as well as direct the future development and set objectives. The first *Five-Year Plan* started in 1953, and the latest one is the 11th covering the period from 2006 to 2010. According to the report from Asian Development Bank, the 11th *Five-Year Plan* stimulates urbanisation, the development of the city clusters and metropolitan structures. (HGL, 2007)

The current National Urbanisation Strategy made by NDRC highlights to endorse the development of city agglomerations towards metropolitan regions. In addition, the strategy also promotes a cross-administrative-area regional town framework to support the cohesion among different planning departments which are responsible for environmental protection, infrastructure, economic development and transport.
On the 17th National Congress of the Communist Party of China (CPC) in 2007, President Hu Jingtai made a report which clearly stated to support the further urbanisation and to promote the more comprehensive economic and regional integration beyond the administrative boundaries.

1.3 The Spatial Structure of China

Up to now, the Yangtze River Delta (YRD) in Southeast China, the Pearl River Delta (PRD) in the south of China, and the Beijing-Tianjin-Tangshan (BTT) in the northern China are the three major metropolitan regions with the densest distributed cities and towns in China. In addition, there are some other urban agglomerations emerging in different parts of China, such as Shenyang-Changchun-Harbin in the Northeast China, Guanzhong-Tianshui in Northwest China, Chengdu-Chongqing in Southwest China, Wuhan of Hubei Province, Changsha-Zhuzhou-Xiangtan of Hunan Province, and the Shandong Peninsular. These urban clusters, with single or multiple cities as centres, are serving as the major economic growth poles of China and have played increasingly significant roles in stimulating the regional development.

The Yangtze River Delta (YRD) metropolitan region comprises sixteen cities - Shanghai, Nanjing, Suzhou, Wuxi, Yangzhou, Zhenjiang, Nantong, Changzhou, Hangzhou,
Ningbo, Huzhou, Zhoushan, Jiaxing, Taizhou, Shaoxing, and Taizhou. The YRD covers an area of about 99,000 km² and has a permanent population of 148 million, which takes up for 11.1% of the total Chinese population. This region contributes 24% the Gross Domestic Product and it is the most economically dynamic region in China.

The Pearl River Delta (PRD) metropolitan region is the oldest economic regional agglomeration and is “an important economic pilot region where the economic reform and opening-up policy was introduced earlier than other regions of China” (Wang, G.T., 2010). This region is located in the southeast of China and consists of 9 cities - Guangzhou, Shenzhen, Foshan, Zhongshan, Zhuhai, Dongguan, Jiangmen, and parts of Huizhou and Zhaoqing - in Guangdong provinces. The land area of PRD metropolitan region is 41,700 km², and the population is around 46 million. The manufacturing industry, especially the export-oriented production of foreign-invested entities has been the main driving force of the fast economic growth. In recent years, the private-owned enterprises and local firms have developed dramatically and played an ever-growing role in the region's economy.

The Beijing- Tianjin-Tangshan (BTT) metropolitan region comprises the municipality of Beijing, municipality of Tianjin, Tangshan and several smaller cities in Hubei province. This metropolitan region covers an area of approximately 42,000 km² and occupies 0.4% of the total Chinese territory. This region concentrated 2.4% of the total population of China, about 35 million inhabitants. The Beijing metropolitan region enjoys an advantageous geographic position, and it is the main corridor connecting the other side of the Pacific Ocean and the inland of Eurasia.

1.4 The Purpose

In general, the development of the metropolitan region in China started relatively late compared to the Western developed countries. Both the developing level and the corresponding policy are in their infancies. The need of comprehensive
development of the metropolitan region is urgent in China due to its fast economic and social growth in recent years. China has the opportunity to learn from the mistakes and achievements of the European Union, the United States and other countries. Therefore, using a specific case as the targeted research has dual values in academic and practical application.

The reason, why Beijing-Tianjin-Tangshan (BTT) metropolitan region is chosen as the target case study, is that it not only shares many similar problems with other metropolitan regions in China, but also has a number of specific opportunities and barriers in its development. According to the requirements imposed by the central government: Beijing as the capital city of China, as well as the political and cultural centre of the country, its development and planning has received much attention from both home and abroad.

The research question of this master thesis is: How to strengthen the polycentricity of Beijing megacity to achieve more balanced development?

In order to find out the answers to the research question, the concepts of metropolitan region, megacity and polycentric megacity will be discussed in the theoretical section of this thesis. The empirical section analyses Tokyo megacity and Los Angeles megacity to learn how the polycentric characters of Beijing can be strengthened.

1.5 Methodology

This thesis is based on study approaches, for example, literature study, related information searching on the internet and the comparison of cases. We also use the deductive method for analysing the empirical material.

Focusing on the theoretical concepts is important for approaching the empirical
material. Theoretical framework guides the content of the empirical material. Then
we can get a basic insight into the issues addressed in economic and social planning
with more critical attitude.

Literature Review

According to our ideas of thesis framework, we will follow it to evaluate the
resources we will discover. Classify them under our thesis framework. The source of
material is from BTH database. All materials of Tokyo, LA and Beijing are based on
literature and statistics from internet, books and journals.

Comparison

Make Tokyo and LA as our experienced examples, Beijing megacity as the target case
study. Through the comparison between them and Beijing megacity, it will be useful
for getting the favourable experience for Beijing.

Case Study

Case study in this thesis will be concentrated on the description of actual situation,
and involves decisions to be made and problems to be solved in the cases.
2. Metropolitan Region and Megacity

– A Conceptual Analysis

2.1 Metropolitan Region

The definition of “metropolitan” in the dictionary is relating or belonging to a very large city.

The definitions of metropolitan region largely vary from country to country according to various national contexts. “Of the many definitions, perhaps the appropriate is the metropolitan region as the catchment for labour, or, the typical limit for commuter journeys to and from the principal city or cities that form its core.” (HGL, 2007)

With the rapid development and strong interaction, the advantages of unified management of critical elements in the hinterlands have become more and more important, for example, transportation systems, infrastructure construction, and environment management. The comprehensive cooperation in metropolitan regions can help to solve the problems caused by metropolitan fragment and stimulate integrated urban planning. It is complicated to define the metropolitan region, for there are many attempts to define the concept of what constitutes such a region. The most notable attempts have been used are population threshold, socio-economic factors, market factors, and functional characteristics. (HGL, 2007) There is no absolute definition of metropolitan region by population size, because it depends on national population level, local facts.

According to OECD, it defines the metropolitan region in European Union as a region which has more than 1,000,000 inhabitants in the core region. (OECD, 2007) The definition of metropolitan region in USA is different. Metropolitan region requires a core area with a large population nucleus and surrounding communities having a
high degree of economic and social integration with that core. Qualification of a metropolitan region needs a city with 50,000 or more inhabitants or the presence of an urbanized area and a total population of at least 100,000 (OECD, 2007). With the rapid process of urbanisation, NDRC of China has also provided an economic description of a metropolitan region as “an urban spatial form to provide opportunities for frequent business activities within a certain distance, which is piloted by one or several big cities, associating with some middle and smaller cities” (HGL, 2007). This definition is characterised by a high degree of coordination and frequent business interactions.

2.2 Megacity

Megacity is a subgroup of metropolitan region and defined as a metropolitan region with more than ten million people. (Pearce and Fred, 2006) “Megacities provide superior economic opportunities because they are larger labour markets in which there is greater potential for efficiently matching employees and employers.” (Wendell COX, 2008)

In 1900, the largest city in the world was London with 6.5 million people (Table 1), which could not be classified as a megacity according to present threshold. In that year, all the top 10 largest cities were from Europe and USA with only one exception: Tokyo which ranked the 7th place and had 1.5 million population. (Lewis, M., 2006)
The last century witnessed a dramatic growth in the large cities and radical changes of rank, because of the emergence of the Asian megacities which enjoyed the roaring speed of urbanisation. Currently, Greater Tokyo is the world's largest city, with a population of 34.2 million. However, Tokyo's growth rate is slowing down and the demographic future belongs to cities like Shanghai. (Lewis, M., 2006)

In more developed world, megacities cover an average of 5,400 km² (range from 1,900 to 11,200). In less developed world, megacities have smaller land area, but have large urban footprints. The average land area is 2,000 km². Otherwise, urban population densities in these two worlds are turned around. The developing world megacities have higher densities, averaging 8,800 persons per km². At the same time, in the developed world, the density is only about half of the number, which is 4,700 persons per km². (Wendell COX, 2008)
<table>
<thead>
<tr>
<th>Year</th>
<th>City</th>
<th>Country</th>
<th>Region</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Osaka</td>
<td>Japan</td>
<td>Asia</td>
<td>13.9</td>
</tr>
<tr>
<td>23</td>
<td>London</td>
<td>UK</td>
<td>Europe</td>
<td>12.5</td>
</tr>
<tr>
<td>26</td>
<td>Paris</td>
<td>France</td>
<td>Europe</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Table 2. Megacities in the World in 2010 (Brinkhoff, T., 2011)

Another important information delivered by the table 2 is that though Tokyo and LA rank before Beijing, both of them are polycentric megacities including several centres, while the number of inhabitants in Beijing just includes inhabitants in the Beijing municipality covering significant smaller area than the polycentric Tokyo and LA. If we change perspective from the municipal of Beijing to the polycentric Beijing, its population is 29.7 million, making it by far the biggest megacity in China and second largest in the world.

“This number of megacities is expected to rise to 31 by 2025. All the 9 new megacities by 2025 are expected to be in the less developed world. There is likely to be strong growth in the megacities exceeding 20 million residents. By 2025, the number is expected to rise to 11.” (Wendell COX, 2008) Through the table 2, the phenomenon can be seen is that the Asian countries especially the developing countries move to the top. Taking a long-term view of urban change, it is not surprising that Asia will boast the most of the world’s megacities. Asia has many densely populated countries and some of the world’s largest national economies with growing importance. These economies are stimulating the urban sprawl and the emergence of the megacities. In addition, historically, Asia has had most of the world’s largest cities for most of the last three millennia. (David, S., 2004)

2.3 Monocentric and Polycentric Megacities

The shape of cities has fascinated economists. In opposition to monocentricity, polycentricity is a system with multiple centres of power. (Terpe, H., 2007) The traditional models of urban economics view cities as aligned around a single,
exogenously defined “mono”-centre, the so called Central Business District (CBD).
(Ahlfeldt, G. M., and Wendland, N., 2010)

"As cities grow in size, the original monocentric structure of large city, tends to dissolve progressively into a polycentric structure over time. The CBD loses its primacy, and clusters of activities generating trips spread within the built-up area. Large cities are not born polycentric; they may evolve in that direction. Monocentric and polycentric cities are animals from the same species observed at different times during their evolutionary process. To some level, monocentric is intra-polycentric. Some circumstances tend to accelerate the mutation toward polycentricity – a historical business centre with a low level of amenities, high private-car ownership, cheap land, flat topography, grid street design – and others tend to retard it – a historical centre with a high level of amenities, rail-based public transport, radial primary road network, and difficult topography preventing communication between suburbs." (Bentley, C., 2006)

The concern about the validity of the monocentric urban model is growing. There are two types of main criticisms. Firstly, affected by land-use price or other reasons, employment is not always concentrated in a central business district. Secondly, there is a debate about whether commuters experience wasteful commuting on their way to work. With the expanding scale of monocentric city and unlimited restriction of CBD, people living in the suburban area usually spend longer and longer time on the way from the company which was located in the CBD to home. Taking polycentric city into consideration, economic centres are separated into different parts within a city, rather than only concentrated in mono-CBD. Industrial zones are the best examples, because these zones are not only for commerce, but also equipped with excellent infrastructure, for example, residential area, school, hospital, etc. They are becoming other centres for a city, then the so called polycentric city was shaped and the new centres may shorten the commuting way.
The notion of polycentricity basically refers to the existence of a number of urban centres in a certain area. It derives its meaning from the patterns and dynamics of functional interrelations and cooperation (versus competition) between these centres. Polycentricity can be observed on various levels of scale ranging from the world-wide network(s) of global cities to the local intra-urban scale (Davoudi, S., 2002), but it means different things or/and deals with different types of interaction and different types of cooperation and competition on different scales. This report deals with the concept of the inter-urban scale within sub-national regions. Beijing, Tianjin and Tangshan are three adjacent cities. A particular manifestation of polycentricity on this scale is based on the existence of “a collection of historically and administratively distinct smaller and larger cities located in more or less close proximity, the larger of which do not differ significantly in terms of size or overall economic and political importance” (OTB, 1999). The polycentric region as a whole is a more appropriate scale than the individual city for policies to strengthen territorial competitiveness within the globalising economy: internal cooperation for external competition. Some commentators emphasise that polycentric structures have potential competitive advantages over metropolitan territories. (Bailey, N., and Turok, I., 2001) Successful territorial cooperation at least demands the pursuing of specific goals that are common to all participants and is believed that all that these goals can be achieved better by cooperation.
3. Two Examples of Megacities

In this chapter we are studying on two examples of the megacities in the world context: Tokyo megacity and Los Angeles megacity. Tokyo megacity is biggest megacity in the world with more than 30 million inhabitants and strong planning traditions. Because the Tokyo megacity is located in Asia, it shares some similar traditions and cultures with China. LA megacity, with a population of 18 million, is the second biggest megacity in the USA and the one with the most polycentric character.

3.1 Tokyo

Tokyo megacity, or the Greater Tokyo Area, consisting of the Tokyo Metropolis and the three adjacent prefectures of Saitama, Kanagawa, and Chiba, is located in the northwest of Tokyo Bay. It ranges an area of approximately 8,303 square kilometres with the overall population of 34.32 million, accounting for 28 percent of all the Japanese population, and the density is 4,133 persons per square kilometre. According to the report of 2007 Revisions of World Urbanisation Prospects released by the United Nations, "In 2025, Tokyo is still expected to be the world's most populous urban agglomeration, with 36 million inhabitants."(UN, 2008)

The Tokyo Metropolis was formed in 1943 by Tokyo prefecture and Tokyo city for the war-time efficiency. In the last period of the World War II, Tokyo was bombed more than one hundred times. In October 1945, when Japanese government signed to surrender, the major area of Tokyo was heavily damaged and laid in ruins. The population at that time was 3.49 million, which was only half of that in 1940. After the new Constitution and the Local Autonomy Law went into operation in 1947, Japan began its gradual recovery in 1950s. According to Tokyo Metropolitan Government (TMG), “the national economic recovery was aided in particular by the
special procurement boom arising from the outbreak of the Korean War in 1950” (TMG, 2010-c), which then bring continued rapid economic growth to Japan in 1960s. Because of the technological innovation and the growth of new industries, the economy started to grow and the people’s everyday life became better. The population of Tokyo reached 10 million in 1962. Two years later, Tokyo held the 18th Olympic Games. The remarkable Shinkasen line, well-known as the “Bullet train”, was put into use, along with the metropolitan expressway. The development of transport field laid the solid foundation of Tokyo Metropolis’s later boom.

However, some problems emerged in the 1970s were caused by the fast economic growth, especially the environmental issues and the serious oil crisis, which gave a heavy strike to Tokyo’s economy.

In the 1980s, Tokyo became one of the most vigorous international economies, due to its well-known fame of cutting-edge technology, information society, fashion frontline, and superior public welfare. It was in 1986 that the “bubble economy” emerged, which led to the incredibly Tokyo’s high land and housing price. At the beginning of the 1990s, the collapse of the “bubble economy” brought Tokyo Metropolis into a serious economic recession.

Tokyo megacity is an important international financial centre, being one of three commanding centres with New York City and London. It also serves as a core for Japanese transportation, commercial, and communication industries. According to a study conducted by PricewaterhouseCoopers, Tokyo megacity area had a total GDP of US$1.479 trillion in 2008 (at purchasing power parity), which topped the list of urban agglomeration GDP rankings (Hawksworth, J., Hoehn, T., and Tiwari, A., 2009). After the World War II, Japan began its centralized development and growth. A large number of companies moved their headquarters from other cities to Tokyo, in order to have better access to the central government and their supports. According to
Cable News Network (CNN), 51 of the Global 500 corporations in 2010 have companies in Tokyo, almost twice that of the second-placed city - Paris. (CNN, 2008)

“Tokyo Metropolis is located in the southern Kanto region, positioned in approximately the centre of the Japanese archipelago.” (TMG, 2010-a) Tokyo Metropolis comprises the city of Tokyo in the east and the Tama area in the westward. In addition, there are the two islands in the Pacific Ocean called Izu Islands and Ogasawara Islands also administratively part of Tokyo. The city of Tokyo is constituted by twenty-three special wards, and each one is a self-governing municipality with a mayor and a council. The 23-wards area is considered to be the “core” area of the Tokyo Metropolis, and this area is about 622 square kilometres, with 8.9 million inhabitants, the population density of this region is about 14,308 persons per square kilometre. It also concentrates the major commercial industries and business actives with a highly-developed public transport system, which greatly facilitates the commuting and transit within this area. The Tama area lies westward the Tokyo Metropolis, covering about 1,160 square kilometres and 4.16 million inhabitants. The rapid growth of this area started due to its geographically connecting to the 23-wards area. However, this region has its own characteristics, such as the distinguished natural environment and the green spaces. In addition, the Tama area centralizes many universities, research institutes and high-tech industries, making this area with strong industrial potential and abundant human capital.

The development of monocentric Tokyo metropolitan megacity is now over large. The expanding city centre forces the residents to move to suburban areas. The high concentration of office functions in the CBD and the on-going urban sprawl causes some problems. Firstly, the demographic change between the day and night is obvious, the crowded city centre suddenly becomes extremely quiet in the night. Secondly, the commuting distance becomes longer, the wasted time is unaffordable. The last one is environmental problems, for example, heat island effect.
Figure 3. Tokyo megacity (Greater Tokyo Area) and the surrounding prefectures (TMG, 2010-d)
Table 3. Structure of the polycentric Tokyo (TMG, 2010-e)

<table>
<thead>
<tr>
<th>Regions</th>
<th>Population</th>
<th>Area (urban)</th>
<th>Pop. Density (per km²)</th>
<th>Distance to downtown Tokyo(km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tokyo Metropolis</td>
<td>12.91 million</td>
<td>1457 km²</td>
<td>8861</td>
<td>------</td>
</tr>
<tr>
<td>Kanagawa prefecture</td>
<td>9.03 million</td>
<td>2191 km²</td>
<td>4121</td>
<td>32</td>
</tr>
<tr>
<td>Saitama Prefecture</td>
<td>7.19 million</td>
<td>2867 km²</td>
<td>2507</td>
<td>43</td>
</tr>
<tr>
<td>Chiba prefecture (west Bay)</td>
<td>5.10 million</td>
<td>1788 km²</td>
<td>2852</td>
<td>55</td>
</tr>
<tr>
<td>Total, core areas</td>
<td>34.32 million</td>
<td>8303 km²</td>
<td>4133</td>
<td>------</td>
</tr>
</tbody>
</table>

The three prefectures of Kanagawa, Saitama, Chiba, and Tokyo Metropolis make up of Tokyo megacity, and the basic statistics are shown in the Table 3. The Kanagawa prefecture, with a population of 9.03 million and an area of 2,415 square kilometres, is located at the southeast part of the Kantō Plain and wedges into the Tokyo Metropolis on the north. The eastern side of the prefecture is relatively flat and heavily urbanized. The Saitama Prefecture is located in the central-east of the Kantō Plain, to the north of Tokyo. This prefecture has 7.19 million inhabitants and 3,797 square kilometres area. Most cities in Saitama prefecture are closely connected to the downtown Tokyo by metropolitan railway, and they are operated as residential and commercial suburbs of Tokyo. The Chiba prefecture is a coastal region to the west of the Pacific Ocean and east to the Tokyo Bay with a population of 6.20 million and an area of 5,156 square kilometres. Most part of this prefecture lies on the hilly Boso Peninsula, a very productive rice farm area, and its most populous zone is in northwest part, which extends into the urban agglomeration of Tokyo Metropolis and Saitama prefecture.

The whole Tokyo megacity is governed by the Tokyo Metropolitan Government (TMG). The TMG is composed by the Tokyo Metropolitan Assembly and the Executive Organs. The former is made up of 127 members directly elected by Tokyo citizens to serve a four-year term, and the latter includes a public elected governor and Auxiliary
Administrative Agencies. The governor has the highest rights besides the Japanese premier minister. The TMG sets sixteen bureaus, including Bureau of General Affairs, Bureau of Citizens and Cultural Affairs, Bureau of Social Welfare and Public Health, Bureau of Industrial and Labour Affairs, Bureau of Construction, Bureau of Education, Bureau of Transport, and so on. It also has six commissions and two departments. The governance of TMG covers all areas and aspects of Tokyo megacity. (TMG, 2010-b)

The present urban strategy for the Tokyo megacity is the big change for Tokyo: The 10-Year Plan formulated by the TMG in December, 2006. According to the TMG, the major goal of this 10-Year Plan is to achieve higher level of maturity, which includes three sub-goals: “1. Resolve the ‘negative legacy’ from the 20th century; 2. Present a more functional and attractive Tokyo; 3. Make Tokyo a ‘beautiful and safe city’ to enhance Tokyo’s international profile, and leave this legacy to future generations.” (TMG, 2010-b) The 10-Year Plan predicts the development of the urban infrastructure and the further achievement in many other fields including environment, safety, welfare, culture, tourism, industry, and sport in 2016.

The planning strategies and management mechanism have played important roles in the polycentric development of Tokyo megacity. After the Second World War, Tokyo implemented three strategies to strengthen the polycentricity in 1950s and 1980s for mitigating the serious problems of overcrowded city and unlimited urban sprawl caused by the rapid population and business increase. Specifically, In 1958, in order to ease the high land price, traffic jam, and environmental issues in the city centre, the government for the first time raised the idea of ‘Setup plan for Tokyo Metropolis’ and created three new centres: Shinjuku, Ikebukuro, and Shibuya. In 1982, to cope with the stress and achieve more balanced functions of the city CBD the government put forward the ‘Tokyo Metropolis long-term plan’. This long-term plan promoted to move the educational and researching facilities to the outside of Tokyo and establish
three more centres in Osaki, Uneo-Asakusa, and Kameido. The business and commercial space are expanded to meet the increasing demand of the international business activities, meanwhile Tokyo formulated the ‘ideas for establishing the waterfront development centre’ in 1987 for establishing information and communication hub and began to develop coastal area. Through the implementation of three strategies, Tokyo saw its significant change and improvement. Up to now, Tokyo has seven centres in all. Every centre is not only the local public active centre, but also undertakes different functions for Tokyo as the international metropolis. Tokyo has been shaped as the networking urban pattern with clearly divisional, coordinating and complementary functional centres. To some extends, Tokyo achieved the goals of concentrating the international managing function, diffusing secondary functions and controlling the urban sprawl by the polycentric development.

The public transport system also has great positive effect on the polycentric development of Tokyo megacity.

According to the TMG, within the 23-wards area in Tokyo megacity, 28.25 million people use public transportation every day. There are various different public transportations existing in Tokyo: 1. the Shankansen lines (bullet train) connect the downtown Tokyo with the suburbs and the other centres in Tokyo megacity; 2. Tokyo subways are operating mainly in the 23-wards area; 3. There are other forms of transportation such as buses, streetcars, Nipppori-Toneri Line (monorail) and guidedrail. Due to the comprehensive transport network, the commuting time between downtown Tokyo and Kanagawa prefecture, Saitama prefecture, or Chiba prefecture are all around half an hour. The reasons of popularity of public transportation in Tokyo can be listed as follows.
1. Tokyo megacity’s efficient public transport system almost covers all areas and vertical dimensions: the Shinkansen, subway, monorail, streetcars and bus. There are many traffic hubs for integrating the different public transport means. People can directly change from one means to another, increasing the efficiency of transfer.

2. The fare system is also convenient in Tokyo. Even though the different public transportations are run by different privately or state-run owners, the price is unified among most of bus lines and the traffic card can be common used by all the public transportations. There are different types of traffic card: one-day card, three-day card, weekly card, monthly card, and three-month card to meet the different needs of people.

3. Traffic demand management in Tokyo includes the dynamic and static ways. The dynamic way means eighty percent of the vehicles in Tokyo are pre-installed the GPS, which can show the best route. Tokyo megacity has set many large-scale parking places outside the city centre, and people are encouraged to use the public transport to get into the city. The static ways mainly refers to the parking management. For people who live in Tokyo, one of the preconditions of buying a car is having possessed a parking place, which costs US $400 per month. The fee for public parking in city centre is also expensive, at least US$ 6 per hour. Therefore, the high cost of using car is also a reason why public transport is very popular in Tokyo megacity.

What is more, the spatial pattern distribution has an important influence. A circle light rail across the Tokyo was firstly built, and every centre was connected by the traffic hubs. Then, many radial patterned light rails spread from each centre to the outskirts or adjacent cities. The new industrial centres and small- or medium- sized cities located in the end of each rail were developed. The efficient and comprehensive railway transport has been the first choice of Tokyo citizens, according to Professor Zhao Hong, the director of Beijing Scientific Socialism
Research Institution, the public transport shares seventy percent of the Tokyo’s total traffic demand among its all 23 wards.

3.2 Los Angeles

The United States has two megacities, one is New York megacity, and the other one is LA megacity in South California. (Rosenberg, M., 2009) LA Megacity is also called the ‘Greater LA Area’. LA Megacity crosses border to five different counties – Los Angeles, Orange, San Bernardino, Riverside, and Ventura. The overall land area of LA megacity is 87,945 km² (more than half of this is sparsely populated eastern areas in Riverside and San Bernardino counties). The total population of LA megacity is 17.8 million. As to the whole megacity’s economy, it has a gross metropolitan product (GMP) of $831 billion, making it the third largest economic centre in the world, only behind the Tokyo megacity and the Greater New York Area.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>10,586</td>
<td>15,717</td>
<td>19,953</td>
<td>23,667</td>
<td>29,760</td>
<td>33,871</td>
</tr>
<tr>
<td>Total5 county region</td>
<td>4,935</td>
<td>7,751</td>
<td>9,972</td>
<td>11,479</td>
<td>14,531</td>
<td>16,373</td>
</tr>
<tr>
<td>Riverside County</td>
<td>170</td>
<td>306</td>
<td>459</td>
<td>663</td>
<td>1,170</td>
<td>1,545</td>
</tr>
<tr>
<td>Orange County</td>
<td>216</td>
<td>703</td>
<td>1,420</td>
<td>1,932</td>
<td>2,410</td>
<td>2,846</td>
</tr>
<tr>
<td>LA County</td>
<td>4,151</td>
<td>6,038</td>
<td>7,032</td>
<td>7,477</td>
<td>8,863</td>
<td>9,519</td>
</tr>
<tr>
<td>LA County as% of Region</td>
<td>84.1%</td>
<td>77.9%</td>
<td>70.5%</td>
<td>65.0%</td>
<td>61.0%</td>
<td>58.1%</td>
</tr>
<tr>
<td>San Bernardino County</td>
<td>281</td>
<td>503</td>
<td>684</td>
<td>895</td>
<td>1,418</td>
<td>1,709</td>
</tr>
<tr>
<td>Ventura County</td>
<td>114</td>
<td>199</td>
<td>376</td>
<td>529</td>
<td>669</td>
<td>753</td>
</tr>
</tbody>
</table>

Table 5: Population growth, LA Metropolitan Region, 1950-2010 (SE, 2002)

In the 20th century, the LA region was insignificant in California's demographic and economic growth, however, with one century’s development, it took the place of San Francisco and became the economic and demographic heart of California. From only 250,000 people in 1900 to more than 17million at present, LA megacity enjoyed sustainable growth. (Table 5)
Above table shows population growth after the Second World War. “The metropolitan area expanded far beyond the City of LA, and far beyond LA County, transforming increasingly distant areas.” (SE, 2002) During the 60 years, the number of population increased dramatically with the falling share of LA County’s population. At the same time, the population in Riverside County, Orange County and San Bernardino County soared with stunning speed. “According to the Southern California Association of Governments (SCAG), the trend of decentralization will continue till the year 2025 at least. LA County is projected to continue declining as a share of total regional population, and both Orange County and Ventura County are expected to decline slightly. San Bernardino and Riverside counties will significantly increase their shares of the regional population.” (SE, 2002)

The multiple clustering of economic activities is one of the most distinctive characteristics of a polycentric metropolitan area. Since the late 1960s, LA has experienced a concentration of industrial production, employment growth. (Edward, S., Rebecca, M., and Goetz, W., 1983) At first, the economy of LA megacity heavily depended on agriculture and oil. Currently the mild climate not only attracted people to live here, “it also provided ideal conditions for the motion picture industry that helped to lead the way out of the recession, and that is today nearly synonymous with LA.” (SE, 2002) The other new industries also stimulate the economic development in LA megacity, such as high-tech, multimedia, and biotech. Although these kinds of high-tech industries are prosperous now, LA megacity still has manufacturing base. This region’s diversified economy is the main factor for the stability of economy.
Some big and dominant cities in LA megacity are selected to show the settlement pattern, development path, the concentration of different industries and the transport connecting of them.

<table>
<thead>
<tr>
<th>City</th>
<th>Population (thousand)</th>
<th>Area (km²)</th>
<th>Density (persons per km²)</th>
<th>Distance between Downtown LA to the cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>3,834</td>
<td>1,215</td>
<td>3156</td>
<td>------</td>
</tr>
<tr>
<td>Long beach</td>
<td>462</td>
<td>130</td>
<td>3553</td>
<td>39</td>
</tr>
<tr>
<td>Santa Ana</td>
<td>324</td>
<td>64</td>
<td>5067</td>
<td>60</td>
</tr>
<tr>
<td>Thousand Oaks</td>
<td>130</td>
<td>142</td>
<td>915</td>
<td>47</td>
</tr>
<tr>
<td>San Bernardino</td>
<td>208</td>
<td>152</td>
<td>1369</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6: Population and Distances among Cities in LA megacity (Advameg, Inc., 2011)

As shown by the Table 6, only one third of the total population of Los megacity lives in the five biggest cities. The population settlement is spreaded in many middle- or small-scale cities, which may be due to the cities’ borders are very narrow. The city of LA is the county seat of LA County. The city has 1,215 km² land area and 3,834,000 inhabitants, and the population density is 3156 persons per square kilometre. Manufacturing has always been the most dominant industry of LA, providing thousands of jobs for the citizens, especially in the apparel, steel fabrication and electronic products sectors. In addition, the aerospace, entertainment and tourism
industries make up of the traditional three-tiered economy of LA. Known as the "Entertainment Capital of the World", LA attracts thousands of visitors every year to its Disneyland, Universal Studio, West Hollywood, various museums, theme parks, and beautiful beaches, which also creates more than 500,000 job opportunities. The Port of LA is the national largest port in terms of value of goods handled and tonnage. (ANON., 2009) The financing industry and international trade are also booming in LA. It is home to six Fortune Global 500 companies and nearly 50 foreign companies locate their US headquarters here. In addition, more than 100 foreign and countless domestic banks operate branches in LA, along with many financial law firms and investment banks (ANON., 2009). The Small-sized and medium-sized companies can get technical assistance at LA Business Assistance Centres, which are formed by community based organizations or the local universities and are funded by the LA Industrial and Commercial Development Division. The new business that wants to locate in the LA megacity can find the assistance at the LA County Economic Development Corporation. Its assistance includes financial, tax incentive, low-interest loan, the employee training and so on(ANON., 2009).

Long beach is located in LA County, about 32 km south of downtown LA, and borders Orange County. It is the 6th largest city in the state of California, with the land area of 130 square kilometres and a population of 462,000. The Port of Long Beach is the United States second busiest container port and one of the world's largest shipping ports. The combined operation of the Port of Long Beach and the Port of LA is the busiest in the USA. In 1920s, the found of the Long Beach Oil Field made the city the most productive oil producer in the world. In 1932, the even larger Wilmington Oil Field was discovered and developed in Long Beach, contributing to the city's fame as an oil town in the 1930s. (CDC, 2007)

Santa Ana is the county seat and most densely populated city of Orange County. It has a population of 324,000 and the density is 5067 persons per square kilometre.
The land area of Santa Ana is around seventy square kilometres.

During the Second World War, the Army Air Force Base was built as a training centre for the US Army Air Forces in Santa Ana. Because many veterans settled down to raise families after the war, the base contributed to the continued population growth in Santa Ana. At present, the arts industry is very important to Santa Ana, an artist’s village has been created and attracts artists and young professionals to live here and create new independent businesses.

Thousand Oaks is the most populous city in Ventura County, with 130,000 inhabitants and 142 square kilometres land area. It is in the northwestern part of LA megacity. The city is well-known as a master planned city, which was created in the middle 1950s. It contributed that the city has fewer problems such as the traffic congestions than that of other cities with the similar size. The main industries of Thousand Oaks are the biotechnology, health care, automobile and financing. Among them the biotechnology and health care industries provide the most job opportunities.

San Bernardino is the city of county seat and also the biggest city in San Bernardino County. It has 208,000 inhabitants and 152 square kilometres. The government, service industry, education, and retail create the most job opportunities and boost the economic development of the city.

The different centres within the LA megacity are connected to each other by various ways, such as the light rails, subways, buses, fights, etc. The rail services in LA megacity can be subdivided into local rail services and the linking rail services. The local rail services are conducted by the Metrolink and LA County Metro Rail, the former one, boasting seven lines through the southern California, provides the major commuter services. It connects all the centres. The later one, according to the LA County Metropolitan Transportation Authority (LACMTA), the metro rail system including the light rail and subway system, is operated to serve more than 9.6 million
people—almost one-third of California's residents—to commute within its 3,711 square kilometres service area by five rail lines.

Figure 5. The Map of Metrolink System Connecting the Cities in Different Counties of California (ANON, 2011)

Figure 6. The Map of Metro (LACMTA system) within the LA County (ANON, 2010-a)

There are five linking rail routines connecting other different parts of the US to LA megacity. The internal Bus services are mainly provided by the different counties' governmental entities, such as the LACMTA, Orange County Transport Authority,
Riverside Transit Agency, Ventura County’s South Coast Area Transit, and San Bernardino County’s OmniTrans. The comprehensive road networks, such as the freeways and highways also play a vital role in facilitating the transportation within the whole LA megacity. The commuting time from Long Beach to downtown LA is around half an hour by car and one hour and a quarter by public transport. The driving time from other centres to the downtown LA is all less than one hour. As to the air service, LA megacity is serviced by four international airports and several minor airports.

The governance of LA megacity is different from that of Tokyo, and it is more county-centred and sub-regional governance. According to Fulton, LA megacity has been an inhospitable environment for metropolitan government and in the 1980s, most Southern Californians, covering all the areas of current LA megacity wrapped themselves up in a self-centred political cocoon. (Fulton, W.B., 1997) Instead of the strong and effective multipurpose metropolitan government, the single purpose agencies and districts have been playing significant roles in LA megacity governance. Those specialized agencies are granted by a regional or metropolitan scope in spatial terms, but their authorities are restricted in single functional area, such as transportation, water quality, open space preservation and air quality (Huber, P., and Meek, J.W., 2005). For examples, the LA Metropolitan Transport Agency, Metropolitan Water District of Southern California, and Southern California Air Quality Management District. The local governments want to conserve the county’s autonomy therefore to restrict the regional organizations’ function in narrow scope where the public policy challenges need cooperative approaches. (Barlow, I.M., 1991)

The governance in LA has been recognized that traditional institutional mechanisms are not the only means, nor the most important one. The alternative means in LA megacity is the joint power authorities sponsored by governments. This kind of governance not only preserves the local decision-making autonomy but also has the
regional scope and significance in providing effective mechanisms for implementing projects and programs. However, it is wise to keep in mind that the sub-regional governance cannot be totally relied on. The sub-regional fund depends on Metropolitan Planning Organizations. The Metropolitan Planning Organization (MPO) is the only form of multifunctional government in regional scope designated by the federal government. The functions of MPOs are planning for transportation, growth management, hazardous waste management and air quality. They do not have competence in land-use planning or budget decisions while according to Davoudi (2002), the land-use planning is essential of spatial planning. In practice, it mainly serves as an advisory planning “think tank” with strong technical expertise and as an intermediary in federal-regional funding relations issues. (Huber, P., and Meek, J.W., 2005) The development path and regional planning of LA megacity is characterized as an “evolving region”. (Bollens, S.A., 1997) The emergence of regional coordination is evolving, rather than the directly top-down governance. As referred by Barlow, the top-down regional government has been in retreat, he believes that metropolitan governments will focus on “attempting to devise an effective system of metropolitan governance, but each in a different way dictated by institutional and political contexts and by local circumstances. Everywhere, however, the goal will be the same: to develop a system that provides coordination and integration for the metropolis as a whole.” (Barlow, I. M., 1991)

3.3 Lessons from the Cases

Tokyo megacity is the biggest megacity in the world and a well-known ‘planned’ megacity. The transport connection within the unplanned LA megacity is not as comprehensive as that of Tokyo, especially the traffic among the other cities beside downtown LA. The planning strategies and governance, such as the Tokyo Metropolitan Government (TMG) and the short-, middle-, and long-term plans for Tokyo megacity, has played a vital role in the development of Tokyo megacity. Since
China also has the tradition of planning and the current situation for Beijing megacity is characterized by lacking governance and management, Beijing can learn much from Tokyo.

According to Sorensen (2001), the planners of Tokyo initially adopted European greenbelt and satellite city schemes uncritically, and then gradually modified them to conditions in Tokyo. In this modification process the greenbelt concept was eliminated along the way, and the planning was concentrated on the development of the sub-centres. It can potentially achieve many of the goals of more ambitious metropolitan structure plans while avoiding the need of shaping overall patterns of growth. The planning of sub-centres of Tokyo was “encouraged by primarily positive measures such as the provision of transport infrastructure and public facilities and zoning bonuses rather than requiring strong restrictive regulatory measures such as building prohibitions in greenbelts.” (Sorensen, A., 2001) Since the 1970s the idea of a ‘multi-polar urban structure’ has become more and more important and held the central place in Tokyo metropolitan regions planning. Specifically, in the early 1970s a plan that proposed a bipolar metropolis with a new central business district based on Tama New Town 44km far from the west of the old CBD, was put forward by the Tokyo governor, and this proposal gradually evolved into the ‘multi-polar metropolis’ ideas of the Third Tokyo Long-Term Plan in 1991. ‘Plan of Tokyo 1992’ outlines the goals of the ‘multi-centre city’: “to make Tokyo into a city with a good balance between work and living, the dispersal of functions throughout the Tokyo Metropolitan Region will be promoted, and the structure of Tokyo will be changed from the present overly concentrated centre to a multipolar structure” (TMGCPB, 1992). In the Fourth and Fifth Comprehensive National Development Plan (CNDP) of 1986 and 1999, the same basic concept was proposed, which was Tokyo should be ringed by three major new ‘Business Core Cities’ at Urawa/Omiya in Saitama prefecture, Makuhari/Chiba in Chiba prefecture and Kawasaki/Yokohama in Kanagawa prefecture. The land areas and the distance of three centres of Tokyo
megacity are smaller than that of Tianjin municipality and Tangshan city, the two main centres in Beijing megacity which will be discussed in next chapter.

The two important features behind the planning of Tokyo megacity can be summarized as follows. Firstly, a consistent characteristic in most of the plans is the concept of a ‘polynuclear metropolitan structure’. The second one is the shift in the measures to carry those plans forward. To illustrate, from 1930s to 1960s, the plan based on ‘greenbelt’ concept required a strong regulatory regime to enforce it. Since the failure of the greenbelt plan, the focus of the planning of Tokyo has shift on promoting the new growth points rather than restricting the development of the green area, thanks to the planning designation and the provision of transport infrastructure and public facilities.

Tokyo megacity is a good model for how to promote the public transport system. The long-distance or inter-urban area can be connected by the railway. The area between the city centres and their suburban districts could be connected by subways. Within each city centre, the public transport could be based on buses and streetcars. The traffic system in Tokyo is with clearly levels based on the short-, middle- and long-distance travel, which makes the system more integrated. As shown on the metro maps comparison between Tokyo and Beijing, Tokyo metro system is more comprehensive than that of Beijing, and Beijing metro system is more grid-like, yet Tokyo metro network seems to have more junctions, which would shorten the travel time. Moreover, Tokyo metro transfer is efficient, and there are four-tier underground stations connecting different lines. Tokyo metro system is also an integrated area of restaurants, malls, theatres, libraries, and other entertainment facilities, which is also in line with “transforming the city from a congested, horizontal sprawl to a verdant, vertical metropolis”, one of main effort of Tokyo Redevelopment Project. The traffic management, especially the static method, is also what we could learn from Tokyo megacity. Moreover, the rails, metros and
other public transport in Beijing megacity are operated by different owners. As we can learn from Tokyo, there is no problem with different operators as long as with coordination, such as the unified tickets system and shared stations.

Figure 7. Maps of metros in Tokyo (ANON, 2010-b) and Beijing (ANON, 2010-c)

The experience of governance of LA megacity indicates that the polycentric megacity is growing organically, the emergence and evolvement of LA megacity is due to an unplanned historical development. The traditional institutional mechanism is not the only way of polycentric megacity governance, the sub-regional management and governance is also of much significance. The scales of different centres in Beijing megacity are bigger than those in Tokyo megacity, and the administrative level is more complicated in Beijing megacity, which makes it harder for the implementation of strictly top-down management. However, as we can learn from LA megacity that the governance structure could be flexible and one form of governance is not indispensable. The case of LA, the evolutionary ‘unplanned’ polycentric megacity, also reminds that the role of spatial planning in promoting the polycentric development should not be over-estimated. There is no one-size-fits-all polycentric model or policy and strategy. The polycentricity is more of the description of an existing reality rather than a planning of a model.
As to the transport in LA megacity, the downtown LA is the only transport hub of the five rails, which connects LA to the other cities. Nevertheless, the public traffic connection among the other different centres is weak, there are no subways or fast train links connecting the internal different centres of the LA megacity. As we can learn from it, a stronger polycentric Beijing megacity needs more connections among all the three major centres, and transport between Tianjin and Tangshan requires to be strengthened.
4. The Monocentric Beijing

4.1 The Administrative Levels in China

In the development of metropolitan region, taking the multiplicity of Chinese administrations into consideration is a significant issue, because the land-use planning in China involves complex administrations. At the regional level, the governance in land-use and management is in a hierarchical structure with five main tiers: state, province, prefecture, county, and township. Cities can be found at provincial, prefectural or county level. The cities in prefectural level include some (urban) districts within their boundaries, and the (urban) districts have the same functions as the cities at county level. (HGL, 2007)

There are four cities (or municipalities) at the provincial level in China: Beijing, Tianjin, Shanghai and Chongqing. These four municipalities enjoy higher autonomous right, for instance, they can govern all the social and economic issues within their jurisdictions. Since the 1980s, the four municipalities have been more autonomous for their own affairs due to the decentralization from the central government.

City governments, whether municipalities or the prefectural and county level cities, are all responsible for the major sectors within their jurisdictions, “including education, health, infrastructure, economic, and physical planning, land administration, urban management, social services, security, welfare, environmental protection, revenue generation, and financial management.” (HGL, 2009)

The recent administrative reforms about the metropolitan region and megacity were put forward by the national 11th Five-Year Plan, which highlights the idea that the urbanisation in China’s context should be promoted mainly by the city agglomerations. There are some pilot policies try-out cites within the country, though lacking of the comprehensive systematic planning policy nationwide. The trial areas
have been established as the ‘Special Economic Zone’ and the ‘development areas’,
to name a few, the Shenzhen Special Economic Zone, Shanghai Pudong New Area,
and Tianjin Coastal Economic Zone, which can enjoy the preferential policies and
practise the newly-made polices by the national government. To illustrate, in Tianjin
Coastal Economic Zone, there are a succession of policy reforms on land-use, tax
reduction or exemption, infrastructure construction, international trade, etc., which
are considered to be essential of the significant social-economic achievements of this
area.

4.2 The Monocentric Beijing

The municipality of Beijing is a metropolitan region in Northern China covering an
area of 16,800 km². Two-thirds of the land is mountainous areas, surrounding the city
on the western, northern and eastern sides. Beijing borders Hebei Province to its
north, west, south, and a small part in the east, and the municipality of Tianjin to the
southeast on Northern China Plain.

Figure 8.: The location of Beijing within China (IMSA, 2008)

Within the municipality of Beijing, there are sixteen sub-divisions: fourteen districts
and two counties. The urban structure of Beijing municipality can be understood by
the approach that divides the whole municipality into four regions based on the
administrative boundaries: (1) the inner centre is Xicheng district and Dongcheng district, composed by the third ring-road; (2) the outer centre includes four districts of Haidian, Chaoyang, Shijingshan and Fengtai; (3) the inner periphery consists of six districts of Mentougou, Fangshan, Daxing, Tongzhou, Shunyi and Changping; (4) the outer periphery includes two counties of Miyun and Yanqing, and the remaining two districts of Huairou and Pinggu. The development among the four urban regions is unbalanced in many areas, such as the public institutions, services, and economic resource.

The total population of Beijing municipality is 22 million which includes 17.55 million citizens with registered permanent permit (Hukou), and 5.1 million inhabitants with temporary residential permits. The average population density of the whole Beijing municipality is 1,310 persons per square kilometre. The population density of the Tokyo Metropolis and LA County is 8,861 and 3,156 persons per square kilometre, respectively. Beijing municipality has large land area, of which two thirds is sparsely
populated mountainous area, whereas the population density of Tokyo is for the compact Tokyo metropolis. Most of the land of Beijing is rarely settled by inhabitants, especially in the periphery areas, and the inhabitants in Beijing are mainly concentrated in the core of Beijing. As illustrated by the table 7, the population densities in the different areas within Beijing municipality vary greatly. In the core urban areas of Dongcheng district (the east-downtown district) and Xicheng district (the west-downtown district); the population density is 19,942 and 25,138 persons per square kilometre, respectively. The density of remaining urban areas is 6,312 persons per square kilometre. As to the rural areas of Beijing, the statistic drops to 200 persons per square kilometre.

<table>
<thead>
<tr>
<th>Districts</th>
<th>Land area (km²)</th>
<th>Population density (person/ km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>16,801.25</td>
<td>1,310</td>
</tr>
<tr>
<td>inner urban area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--Dongcheng district</td>
<td>44.25</td>
<td>19,942</td>
</tr>
<tr>
<td>--Xicheng district</td>
<td>48.14</td>
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<tr>
<td>outer urban areas</td>
<td>1,495.93</td>
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<td>Inner periphery areas</td>
<td>6,466.28</td>
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<tr>
<td>Outer periphery areas</td>
<td>8,746.65</td>
<td>200</td>
</tr>
</tbody>
</table>

Table 7: the population density of municipality of Beijing in 2010 (BSB, 2011)

In 2010 the GDP of Beijing increased 10.1% from the previous year. The GDP per capita was US$11,448 with a growth rate of 6.2%. By the end of 2007, there were 751 financial organizations in Beijing, making up 13.8% of Beijing’s GDP, ranking the highest among that of all Chinese municipalities and cities. In 2010, Beijing had 30 companies of Fortune Global 500 corporations, and was in the second place worldwide only behind Tokyo. (CNN, 2010)
Because of its status as the political, cultural and economic centre nationwide, Beijing concentrated 82 universities and colleges and 117 research institutions, with 982,000 undergraduates in 2009. In 2010, there were 219,000 graduates, among them 63,000 were postgraduates. The Haidian district, in the north-western part of the Beijing, has evolved to a major education and R&D cluster in China. Haidian District is home to Chinese Academy of Sciences and many high quality universities, such as Beijing University, Tsinghua University, the People's University of China, the Central Institute of Nationalities, the Beijing Normal College, the Chinese Medical College, as well as institutes specializing in aeronautics, petroleum production, music, forestry, art, agriculture, etc. (Wang, G.T., 2010) Beijing is also a very welcomed choice for international students, and it has attracted approximately 17,000 overseas students to continue their further study here.

One of the four specially designated industrial development zones of Beijing municipality is the Zhongguancun Science Park (ZGC), located in the Haidian district. The ZGC is frequently referred as the “China’s Silicon Valley”. It was established by the national central government in 1988, and named as “Beijing High-tech industry development experimental zone”. Since then, ZGC has been the biggest and most important centre in electronics, ICT research and development, and computer-related industries. Many famous technology companies have set their research centres and Chinese headquarters in ZGC, such as Google, Intel, Oracle Corporation, AMD, Motorola, Sony, and Ericsson. In 2008, Microsoft had its Chinese headquarter in ZGC, with more than 5000 employees.
Referring to the inner city transport system, Beijing now has 14 subway lines, 172 stations and 336 km of track in operation. Beijing subway ranks the fourth in track length in the worldwide and also the fourth in the annual ridership after Tokyo, Moscow and Seoul.

The plan for 2020 is to build 30 subway lines and 450 stations will be reached with 1,050 km in distance, and the residents within the fourth ring-road can walk to a station within 10 to 15 minutes at that time. Now this plan will help to increase the subway coverage of the 95% urban city in 2020, in addition to the subway, there are nearly 700 bus routes in Beijing, including three Bus Rapid Transit (BRT) routes. (Shixi, 2010)
The outward city transport system in Beijing contains railway and airport. As the national capital, Beijing is the largest railway hub in China. The railway lines in Beijing cover large area in China. There are lines from Beijing to Shanghai, Guangzhou, Harbin, Baotou, Tianjin, etc. According to the statistics in 2010, 173 trains stopped in Beijing Station daily, meanwhile, 232 in Beijing West Railway Station, 163 in Beijing South Station and 22 in Beijing North Station. There are also other high-speed CRH trains (China Railway High-speed trains). International trains to cities in Mongolia, Russia, Vietnam and North Korea, all run through Beijing. Beijing’s primary airport is Beijing Capital International Airport (BCIA). As the core pivot of Europe, Asia and North America, BCIA possesses an advantageous geographical location, a simple and convenient transferring procedure and a highly effective collaboration, making it the most convenient aviation hub connecting Asian, European and American aviation markets. BCIA is one of the busiest airports in the world, everyday there are 1,400 flights from more than 70 airlines connecting Beijing with other 208 cities in the worldwide. Its annual passenger throughput has increased from 1.03 million of 1978 to 67.93 million of 2010, ranking the second place in the world. Meanwhile, with its fast growing passenger and cargo flows, a fast-developing airport industry has been
taking shape, and the influence of the airport on the regional economy has been increasing day by day. (BCIA, 2009)

4.2.1 The Spatial Pattern of Monocentric Beijing

Beijing was a major regional political centre, dating back to the Warring States period (484–221 BC) and the capital city of Yuan, Ming, and Qing dynasties, the three most prosperous dynasties through Chinese history. “The important historic status is the reason why the street network and all monumental architecture in Beijing were aligned with the cardinal directions to conform to Chinese geomancy”. (Dikötter, F., 2010)

The imperial city is the core of the traditional centre. At the time of the establishment of the People’s Republic of China in 1949, the municipality of Beijing was only made up of the traditional centre and its immediate suburbs. The urban area was divided into many small districts inside where now is the second ring-road. In 1949–1978, due to Mao Zedong’s socialism, all the Chinese cities were encouraged to be planned as manufacturing and industrial centres. Beijing’s was reshaped by the large walled work-unit compounds. The workers seldom stepped out of their compounds because the compounds are accommodated with housing, production facilities, clinics, food distribution and even schools. “This planning method had minimized the need for the specialization in neighbourhoods, and lead to the districts relatively undifferentiated by function”. (HGL, 2007) “After 1979, following the economic reforms of Deng Xiaoping, the urban area of Beijing has expanded greatly, and the urban development was in line with the strategy of spatial and functional specialization”. (Elisabeth J. P., and Christine W., 1985) The eastern half of the inner centre was planned as foreign embassies and international organizations, and the western half was planned to serve the domestic functions. According to Gittings (1996), Beijing’s master plans in 1982 and 1993 were largely affected by analytical
According to Tian, Wu, and Yang (2010), the contemporary urban scientists and planners have mainly applied the concentric zone to the development and growth of Beijing. As said by the concentric theory, a city is formed by several zones with different functions, framed by some concentric rings, and the function zones can be the CBD, the transition zone, the working-class zone, the residential zone, and the commuter zones. The spatial pattern of Beijing is composed by five zones and six ring-roads. The major road around the Forbidden City is called the first ring-road, and the concentric roads beyond the first one are named as second, third, fourth, fifth, and sixth ring-roads in turn, because of the radial distance from the centre of the city. (Tian, G.J., Wu, J.G., and Yang, Z.F., 2010) The six roads afford the main transport flow in Beijing. The second ring-road is fully located in Beijing’s inner city areas. Ring-roads tend to resemble expressways progressively as they extend outwards, with the fifth ring-road and sixth ring-road being full-standard National expressways-linked to other roads only with interchanges. The seventh ring-road that will transcend the municipal boundary is under design. Expressways to other regions of China are generally accessible from the third ring-road outward.

The first zone is the area within the third ring-road. It was frequently called the CBD, with main functions of public management, commerce, education, health care, media, entertainment and hotels. The area inside the second ring-road is the core of Beijing where locates most of the historical sites, such as the Forbidden City, Tiananmen Square, Chang’an Street. The second zone is the area between the third and fourth ring-roads, and it is dominated by official buildings, residential areas and commercial facilities. The third zone is between the forth and fifth ring-roads, with more factories, companies, sports grounds and residential districts. The forth zone is between the fifth and sixth ring-roads, which is mainly for residential and manufacturing functions and can be called as residence-manufacture zone.
However, since the concentric theory is rooted in the American urban land-use pattern and lays little emphasis to the transport and industries, the huge differences between Beijing’s situation and the classical theory still exist. “Each of the 5 zones in Beijing is mixed with multiple urban functions.” (Gittings, J., 1996) Additionally, in contrast to the classical theory, few wealthy and middle-class citizens have moved outward to suburbs. Many of the few wealthy own two houses, and they work and live in the central city in weekdays and go to suburban on holidays. The spatial structure of ring-road satisfies the concentric theory in many aspects, however, the theory cannot fully explain Beijing’s some distinctive spatial patterns.

4.2.2 Problems with Being Monocentric Beijing

The monocentric Beijing megacity model has been extended to include a variety of negative features, and each stimulates the formulation of polycentric Beijing.

Firstly, as the capital of China, Beijing affords excessive pressure, which restricts Beijing’s development both in economy and society, and it limits the positive influence on the adjacent area.

Secondly, one of the biggest concerns with traffic in Beijing involves its traffic jams. Even outside of rush hour, many main roads still remain clogged up with traffic. One reason for this situation is the rapid increasing number of private cars. By the end of 2010, there were 4.8 million vehicles in Beijing, and among them 3.744 million were private cars. (BTRC, 2011) “Beijing’s car community will have grown by 1 million in only two-and-a-half years. It took cities like Tokyo 12 years to reach that rate of growth.” (Qian, Y. F., 2009). In 2002, Beijing recorded a total of 16,789 traffic jams, with rush hour actually consuming 11 hours of a day. (Xinhua, 2003)

Thirdly, the high density of housing and population caused environmental problems, such as heat island effect. These are not helpful for the improvement of life quality.
Fourthly, the old historic centres and historic heritages, such as the Forbidden City, are clustered in the heart of Beijing. To protect these fantastic cultural and historic legacies which witnessed China’s development, it is useless to avoid the contamination of urbanisation. The monocentric model always swallows these old areas for CBD’s development, especially those located in the centre.

4.3 The Polycentric Beijing Megacity

Beijing, Tianjin and Tangshan have the original internal driving force for the integration with becoming polycentric Beijing megacity. The physical connection is the natural link. From a historical view, since eight hundred years ago, Beijing has been the country's political centre, economic centre; Tianjin in Northern China is the largest commercial centre and open city, and as the gateway to Beijing; Tangshan has important military position with mountain behind it and sea in front of it. With the urbanisation in recent years, the basic information has been changed, such as land area, the number of population which has been illustrated in table 8. The emergence of polycentric Beijing megacity will influenced the three cities in various aspects, for example, the quality of labour force, industries patterns, transportation coordination, etc.

<table>
<thead>
<tr>
<th>City</th>
<th>Land area (km²)</th>
<th>Population (million)</th>
<th>Population density (persons/km²)</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing(BJ)</td>
<td>16,400</td>
<td>17.55</td>
<td>1310</td>
<td>BJ-TJ: 137</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BJ-TS: 150</td>
</tr>
<tr>
<td>Tianjin(TJ)</td>
<td>11,900</td>
<td>11.76</td>
<td>1176</td>
<td>TJ-BJ: 137</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TJ-TS: 120</td>
</tr>
<tr>
<td>Tangshan(TS)</td>
<td>13,400</td>
<td>7.35</td>
<td>534</td>
<td>TS-BJ: 150</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TS-TJ: 120</td>
</tr>
</tbody>
</table>

Table 8: the population and distance of BTT (CSB, 2010)

Due to the geographical locations of Beijing and Tianjin, they are lack of natural resources, such as water shortage, inadequate energy and raw materials shortage.
They need to rely on the resources support from Tangshan. On the other hand, the technology and economic strength in Tangshan lags behind Beijing and Tianjin, and it needs to use the radiation effects from them to optimize its industrial structure, employment structure and attract capital, talent and high-tech projects. In this way, Tangshan could catch up with the other two cities. Visibly, Beijing megacity can coordinate the various elements among these three cities helping them to develop in a balanced way.

Compared to Tangshan, the population densities in Beijing and Tianjin are more than twice as high. The land area of Beijing is 16,807 square kilometres, and in Tianjin, it is 11,919 square kilometres. The densities of Beijing and Tianjin are 1,310 person per km² and 1,176 person per km² respectively. Because the lack of land and non-renewable recourse, such as coal, iron ore and petroleum which are the basic recourses for the industrial development, they should enhance the efficiency of land-use and natural resources. Not only the local population increased, but also the migrants led to the tension of land-use. The huge density caused the pressure on several aspects, for example, housing, employment problems, even scarcity of resource and environment aggravation. However, the population density in Tangshan is only around 534 person per km².

The quality of labour force’s disparity in Beijing, Tianjin and Tangshan is obvious. Science and technology is primary productive force, and therefore, the importance of knowledge and innovation-based economic growth is even more prominent. Innovation is carried out by people, and in turn the quality of labour force determines the innovation capability, so the quality of labour force becomes a critical indicator to measure the economic growth.

In 2000, only 5.3% of the employees had a college degree in Tangshan, the number of college-degree employees in Beijing and Tianjin were nearly seven times higher
than that in Tangshan. (Li, 2005) The share of labour with technical skills was only 4.6%, a figure that could be compared with 18% in Beijing and 11% in Tianjin. (Li, 2005) Apparently, Tangshan has the smaller proportion of labour with a college education and a significant lower share than that in Beijing and Tianjin. This may restrict the development of Tangshan and also unbeneificial for the integration for the Beijing megacity. The low quality labour force is unfavourable for the industrial development, which will slow down the industry transferring from Beijing, Tianjin to Tangshan, which intends to accelerate Tangshan blend into Beijing megacity. When the technology-intensive industries are moved to Tangshan, more challenged job opportunities will be provided there, which could attract various well-educated people, and it may improve the quality of labour force in Tangshan region.

At present, high-tech industry is Beijing’s main industrial pillar, the so-called technology-intensive industry. It contributes one third of GDP in Beijing. (Wang, L.D., 2010) Tianjin’s industries are in the capital-intensive to technology-intensive transition period, meanwhile, Tangshan is still at the stage of capital-intensive industries.

The three cities have different specializations in economic development. Beijing has specialized in knowledge economy, and Tianjin has been famous for processing, manufacturing and shipping industries. The Tianjin Coastal Economic Zone is a typical example for these industries’ development. Tangshan is a heavy industrial base with abundant resources, which has advantage in mining industry. These are the specialisations in these three cities in industries and they have strong characters in complementary. If strengthen the integration among Beijing, Tianjin and Tangshan deeply in transport system, real estate, industries and other fields, it could be more conducive to better division of industrial structure for enhancing the overall competitiveness of the region.
Beijing is the national political and international communication centre with rich cultural civilization. Tianjin is the northern economic centre, trade centre, shipping centre and logistics centre. Beijing and Tianjin should fully deploy their respective advantages by adjusting industrial structure. For example, if Beijing is committed to research and development in the manufacturing industry, engaging in critical technology research, then Tianjin could become manufacturing centre and R&D transformation. The position of these function layout can minimise the capital investment by avoiding reconstruction and make full use of human resources with the talents free flow in these three cities, at the same time, easing the pressure of monocentric Beijing.

In the other aspect, Beijing as the capital city, every year the national government gives more financial support to it each year than other cities for its development. Tianjin is better at the aspect of logistics, warehousing, processing and packaging. There are advantages in the organization of logistics. It will be beneficial if companies set headquarters in Beijing, putting warehousing and manufacturing in Tianjin. Tangshan is rich in mineral resources, is an important source of energy, raw material industrial base. Metallurgical industry is the first industrial pillar in Tangshan, providing the resources to Beijing megacity industries. With the help of market economy, companies can freely choose the locations of headquarters and manufacturing factories. When companies realize the respective advantages of these cities, they could make their wise location decisions.

**Transportation**

Geographically, the distance from Beijing to Tangshan is 150km, from Tangshan to Tianjin, it is 120km. The distance between Tianjin to Beijing is 137km. (Liu, 2004). The distances are not very short but the high-speed trains has made the travel time short.
Beijing megacity is the biggest national transportation hub. Beijing South Railway Station served as the Beijing terminus for the Beijing-Tianjin high-speed train. It is one of the fastest regular passenger train service in the world. The 117km line boasts a maximum speed of 350km/h reducing the travel time between the two cities is around 30 minutes. (Fletcher, H., 2008). It will take one and half hour to travel from Beijing to Tangshan averagely. Nine main railways cross Beijing connect the most part of China. Tianjin is in the node of two busiest railway, Jinghu and Jingha railway, and it has the biggest trade port in Northern China. Tianjin port is classified as high level port and boasts the fifth largest comprehensive port in the world. (Liu, 2004) It boasts 30 liner routes with connecting to more than 160 countries and regions for keeping more than 300 ports shipping business. Tangshan is the major link city between Northern and Northeast China. Four famous railway lines run through Tangshan.

4.4 Advantages of Strengthening the Polycentricity of Beijing Megacity

At the early time of the foundation of China, the domestic economy lagged behind and living standard was very low. Beijing was an industry-dominated city at that time and the core of Beijing’s task was the development of economy, especially putting emphasis on the heavy industry which triggered a series of development problems in Beijing. In 1983, the CPC Central Committee and State Council approved the "overall plan of Beijing urban construction". In this plan, it highlighted that strengthen Beijing’s two fundamental functions further: political and cultural centre. Meanwhile, it put the high-tech economy in the front place for it would promote the economic development in Beijing. In this plan, Beijing was on the way to transfer to polycentric Beijing with the idea of moving heavy industries to adjacent cities. The enhancement of the economic power was helpful to play the political and cultural centre function in Beijing. "Beijing Urban Master Plan (1991-2010)" continued to emphasize Beijing as the country's political and cultural centre, and pointed out that Beijing should
stop the development of heavy industry. Based on the process of opening-up policy of China’s socialist modernization and the requirements of the capital city, the first time in the overall plan of Beijing made clear to the position of an international exchange centre, which was once again enriched the capital city functions and development. According to these changes of master planning, Beijing needs to develop polycentricity to transfer economic function to other areas which are inside the polycentric Beijing and can ease the excessive function pressure in Beijing.

The most valuable experience from the development of Yangtze River Delta and Pearl River Delta regions is driving regional economic development through industrial chains which formulate the economic circle with the support from government. The government makes the plan for the economic circle, and the plan includes not only land-use planning, but also preferential policies and infrastructure planning which stimulate the shape of economic circle. Beijing, Tianjin and Tangshan did not form a clear industrial chain, and resource cannot be allocated effectively in the region and labour force cannot be divided to cooperate efficiently. Beijing and Tianjin, the two cities boast rapid development of various industries, compared with them, Tangshan is lagging behind in modern technology intensive industries. The biggest disadvantage in the developing way is “auxiliary projects”, for example, “Beijing Hyundai” car factory demands all the car accessories should be bought from those factories located in Beijing. The similar demands give Beijing more pressure in industrial development invisibly. As to share the pressure and coordinate Beijing megacity’s development, erecting the industrial core in Tianjin and Tangshan could help. The aim is possible. Firstly, in the transportation aspect, since Beijing South Railway Station re-opened in 2008, the travel time between the two cities has been reduced to around 30 minutes. In 2007, after the operation of CRH Trains, it takes one hour from Beijing to Tangshan. Convenient and integrated transportation network is the first step to build a polycentric megacity. Secondly, in the aspect of labour force, Tangshan and Tianjin have abundant labour force with unsatisfied
employment rate. To build qualified labour force, it needs education. The promising way is that the workers can register in Beijing’s universities or training institutions, and learn knowledge through distance education which realizes the education resource sharing in Beijing megacity. Along with the moving out factories from Beijing assembled in Tianjin and Tangshan, it can be helpful for developing industry parks in long term and releasing the large number people flow to Beijing for hunting job every year. Not only the function pressure in Beijing can be eased through erecting new industry centre in Beijing megacity, but also the demographic pressure and other pressure, such as commuting pressure for transportation also can be decreased.

Traffic congestion released

Referring to Beijing commuting pressure, polycentric Beijing megacity can change the old situation. Beijing concentric spatial pattern leads that political, commercial, cultural, educational, health care, tourism and other core functions are all concentrated in urban central areas. In the second ring-road, there are more than 20 central-level agencies, 100 bureau-level departments, more than 250 Beijing municipal authority level units and Xidan, Wangfujing, Qianmen super commercial centres. The Forbidden City, Beihai Park and many other famous tourist attractions are all gathered here. Urban functions are concentrated excessively in the monocentre. Beijing ranks the first in the “Unsatisfied Traffic congestion in China”, and the average car speed is 30km/h. (Wang, W. B., 2005). According to statistics, among the first, second and third ring-roads, there are more than half of the total travel flow in Beijing. The car speed decreased 50% compared to that of ten years ago, in the main road intersection, the rate of traffic jam is higher than 60%.(Yi, M., 2011) Now as a monocentric city, the city centre is the heart of Beijing, as all the blood should flow to heart, all the traffic flow should influence the city centre. The continuous expanding Beijing burdens the city centre. Comparing the city centre to a
person’s heart, the ability of heart is finite, and so is city centre. Therefore, polycentric Beijing megacity is necessary. Different cores are in charge of different functions, and then the traffic flow will be divided into several parts, no longer concentrated in the monocentric city centre, which will ease the traffic pressure in long term. The emission of car exhaust might be decreased by released traffic pressure which is also helpful to protect and improve the environmental quality in Beijing.

Old city protection

More than half a century ago, the construction of new Beijing was based on the old Beijing city. From that time, the competition between new and old city started. The centre of Beijing city is also the old Beijing city centre where the historical memory located here. During the past decades, the Beijing city experienced three big reconstructions. The first one is in the beginning of the foundation of China in 1950s, the second time is in the 1990 and the nearest one is from 2000 to 2003. These reconstructions destroyed more than half precious historical and cultural architectures in the old city. In 1949, there were 20 km² historical architectures, but now less than a quarter of them were preserved. (Huang, H., 2010) Since the mid-20th century, the number of Beijing Hutong has dropped dramatically as they have been demolished. These historic heritages were collapsed for making way to build new skyscrapers and wider roads. History gives way to economic development. Tracing the reason of this situation, one of the reasons is that the monocentric Beijing has no space for historic heritages. The expanding centre and the need for land-use has squeezed old city, which caused the three reconstructions. In another way, the density of population in the city centre is extremely high, which is up to 22,000 persons per square kilometre, comparing with New York and London, there are only 4,000 to 8,000 persons per square kilometre. (Huang, H., 2010) As to protect the old city, the residential density should be decreased in order to avoid the
fourth demolition. Polycentric Beijing megacity with new sub-centres can stop the tragedy. It can ease the pressure of land-use in the city centre which can protect the remained historic heritages and avoid giving space for new city development. In this way the complete scenery of old Beijing can be preserved.
5. The Approaches for More Balanced Development of the Beijing Megacity

5.1 The Meaning of More Balanced Development of Beijing Megacity

Along with the deepening of regional unbalance caused by globalisation, polycentricity has been a main target for most cities and regions in the process of pursuing balanced development. As mentioned in the last chapter, Beijing megacity is an intra-regional polycentric megacity, and the polycentricity is benefit to the development of Beijing megacity. According to the ESDP, the concept of polycentricity aims to achieve more balanced regional development. What does more balanced development mean? Firstly, we are to show the status quo of Beijing megacity of its unbalanced development.

1. Competition is more intensive than the cooperation within the megacity. For example, the iron ore and oil resource locates mostly in Tangshan city. However Beijing municipality has built many resource pre-treating factories, and has superior production capacity. The establishment of those factories occupies the capital, investment, and talents, thus Tangshan city does not get the economic and technology radiation, and even has to provide the resource to Beijing municipality. The unbalanced development is embodied in the unbridled competition of the similar industries such as the heavy industries, which makes Beijing municipality stronger, and weakens the advantages of the Tangshan city.

2. The environmental issues are becoming serious. The overcrowded urban population and the rapid growth of the number of automobile lead to the serious traffic congestions in urban area. The land areas of per capital in Beijing municipality and Tianjin municipality are only 9.45 and 9.33 square kilometres, respectively, which are lower than the national average of 10.34 square
kilometres and 15.36 square kilometres of Shanghai. Moreover, the environmental degradation becomes the bottleneck of Beijing being the global city.

3. The unbalanced developed of polycentric Beijing megacity is also reflected by the central governmental policy. Beijing municipality borders two major cities and several smaller cities, which are in different administrative levels. Tianjin municipality enjoys the coastal cities’ preferential policy, and Beijing has always been given various preferential policies due to its important capital status. While Tangshan, as both the coastal city and old industrial base city, has not received any preferential policy. The government is partial to Beijing and Tianjin municipality and makes light of Tangshan, which is also an important city and a centre of the polycentric Beijing megacity.

The balanced development of Beijing megacity should include: the more coordination rather than competition in industries’ development and transportation; strengthening the small-medium cities’ development; pay more attention to the environment and ecology; and more coordinating policy system and management mechanism.

In addition, according to Davoudi (2002), the balanced development can be subdivided as the geographically balanced development and the functional balanced development. The former one can be achieved “through the provision of financial incentives and infrastructure in peripheral regions whilst constraining growth in the over-heated ones” (Davoudi, S., 2002). However, the development of the weaker cities is not to be achieved by the outflows of resources from the prosperous core, but be promoted polycentric urban regions to achieve the balanced development through the spatial strategies. More specifically, it means that to achieve the balanced polycentric development of Beijing megacity is not an easy task which just
relies on the funds allocation or financial assists to weaker centres. It needs the concrete strategies and approaches that covering many areas such as the cities’ functions, industry transferring, transport coordination, governance, and etc.

5.2 The Functions of Beijing Municipality in Beijing Megacity

Beijing municipality is the biggest city in both size and population in polycentric Beijing megacity. Under the current situation of increasing cooperation while widening disparities among the inner area of Beijing megacity, Beijing municipality should play a pivotal role in strengthening the strong polycentricity and achieve more balanced development. Beijing municipality’s functions could be identified to include the distribution of factors of production, services, economic radiation and regional innovation. Beijing’s character is to radiate the adjacent areas, play active role in pulling economic development and coordinate the economic cooperation in adjacent area with the aim of common development.

The first function is to distribute factors of productions. Beijing municipality’s distribution function means the ability of collecting and diffusing the productions and diversified production factors. Beijing megacity breaks the administrative divisions among the inner cities so that it decreases the transaction costs. Beijing is the most vital spatial node in the regional economic circulating network. With its excellent transport and information services, Beijing municipality has already been the trading centre of the bulk commodity and the transaction centre of regional import-export trades. The accumulation of various production factors, such as the capital flow, personnel flow, information flow, technology flow and commodity, not only benefits the development of Beijing municipality itself, but also promotes the form of coordinating industrial system and industrial clusters.

The second one is the service function. The Beijing megacity needs several regional economic hubs to provide comprehensive and effective services for the free flow of
various economic activities and commodities. Beijing municipality now is the biggest service hub, in 2007, the output value of the tertiary industry made up 71.5% of the GDP of Beijing municipality. Its services include: 1. the biggest air-land traffic hub all over China; 2. China’s largest communication and information service network; 3. the largest number of the intermediary consulting companies and organizations; 4. the national major financial supervisory service centre. The service sector is the important industry of Beijing municipality, it also give a hint to the industry division within the Beijing megacity. Though Beijing municipality enjoys high speed of the development of high-tech and tertiary industries, however, due to the historical reason, it has still left some heavy industries, which is not suitable for the development trend of capital city. There is potential and a need to transfer some of Beijing’s industries to the other centres in the megacity.

The Third function is economic radiation. The further development of the megacity, the upgrading of the industries, and the high speed of the technical progress all need the relatively stronger centre to play a radiation and driving function. Beijing municipality, as the biggest centre, has attracted a large number of talents, capital and material resources. Especially after the 2008 Beijing Olympic Games, a great quantity of investments has made Beijing more dominant. In order to get more balanced development of Beijing megacity, the radiation function of Beijing municipality should have the directions, in which way creates the manufacturing centre, trading centre, technology centre and other centres of the inner megacity.

The final one is the innovation function. The intra-regional cooperation in Beijing megacity is of much significance, however, the inter-regional cooperation with Yangtze River metropolitan region and the Pearl River metropolitan region aiming at stimulating China’s economic growth is also important. The innovation is one of the important driving forces of regional development. As shown in the Table 8, Beijing
municipality is the uncontested science and technology centre in the whole Beijing megacity. Upon the inherent advantages, such as the large numbers of creative class, universities and research institutions, Beijing municipality should make efforts to create the clusters of the high and new innovative technology enterprises.

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</thead>
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<td>Beijing municipality</td>
<td>1.9million</td>
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<td>5.25%</td>
<td>46</td>
<td>58</td>
</tr>
<tr>
<td>Tianjin municipality</td>
<td>0.78million</td>
<td>15 billion</td>
<td>2.45%</td>
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<td>22</td>
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<tr>
<td>Hebei province</td>
<td>0.2million</td>
<td>10 billion</td>
<td>0.67%</td>
<td>-</td>
<td>19</td>
</tr>
</tbody>
</table>

Table 8: science and technology (S&T) resource allocation within Beijing megacity (2004-2008) (NBS, 2010)

5.3 The Approaches for Balanced Beijing Megacity

5.3.1 Governance and Management Integration

The complication and particularity of the administrative division in China leads to the huge obstacle to the coordination among the different level of cities. Within Beijing megacity, Beijing municipality and Tianjin municipality are two provincial level cities, while Tangshan is a prefectural level city. The strong administrative division also leads to the local protectionism, which causes the repeated construction of infrastructure, industrial structure convergence and blind competition. This kind of man-made division makes the three cities all establish the completed market and industry system on their own, and it has blocked the circulation of resources and factor flows greatly.

One way to strengthen the integration between the three cities is to establish
integrated governance, because it could help to allocate and share resource, to make the information interchange, to connect the three cities closely as a whole. The forms of the integrated governance could have different alternatives. For example, one of the alternatives could be the consultation mechanism in membership, that is to say, a joint megacity planning bureau made up by the representatives from all the involved cities. The consultation mechanism provides a platform where they discuss and negotiate on major issues and vote for the solutions.

Considering that Beijing municipality is the capital of China, Tianjin is also a municipality which has the higher autonomous rights compared to Tangshan city, thus the functions of the mechanism based on vis-à-vis local governments might be limited. So another alternative of the integrated governance could be to establish a permanent organization with the power beyond all the local governmental rights, and it takes charge of the major programmes such as infrastructure construction, use of resources, protection and remediation of environment, and the distribution of dominant industries or industry zones/belts. Tokyo megacity has set an example of what the organization is like: Tokyo Metropolitan Government, which has an elected governor and a metropolitan assembly with 127 members, with the competency of all areas of Tokyo megacity “including lakes, rivers, dams, farms, remote islands, and national parks in addition to its neon jungles, skyscrapers and crowded subways” (TMG, 2010-c). However, LA megacity’s sub-regional governance also implies that the interdependent relationship of local government and regional institutional government is of great significance. The integrated governance of Beijing megacity could be combination of the two kinds of governance, to learn from both of them critically.

Taking Chinese actual situation and development histories into consideration, the characteristics of the governance of Beijing megacity could include the following four points.
Firstly, establish a unified planning mechanism. The regional development’s master plan and the special projects’ plans of the whole Beijing megacity are needed, and the intra-regional coordinative and cooperative projects could be important. The different commissions should be organized to seek for the common interests and the bureaus can be established to govern to different sides of Beijing megacity.

Secondly, build the impartial interests exchange relations. The present economy situation within Beijing megacity is that the price of resources such as energy and raw material in Tangshan and nearby smaller cities are very low, however, the manufactured products in Beijing and Tianjin are very expensive. The coordinative price policy is the guarantee to the fair relationship of interests exchange. The price policy could include the beforehand coordination and afterwards coordination. The former one means providing the preferential policy and financial assist, and the afterward coordination means to give compensations to the aggrieved party by redistribution of the national revenue.

Thirdly, the coordinative mechanism should be at high level. There were once the several joint meetings of citizens held among the three cities, but the influence was little. The coordinative role of central government is needed. The National Development and Reform Commission could organize a Beijing megacity’s Arbitration Committee. The main functions of the arbitration committee could include: 1. make the unified planning and policy for the whole megacity; 2. be responsible for organization, consulting and coordination; 3. arbitrate the cross-administrative border disputes. In addition, the Arbitration Committee can learn from the WTO in some aspects especially when the local protectionism is involved.

Finally, the dialogue system and the information interchange mechanism among the local governments need to be improved. To lead the industrial development through investment information, avoiding the cutthroat competition. Taking Tokyo as an
example, it has the mature governmental spokesman system. Beijing could also establish a similar platform for information interaction.

5.3.2 Comprehensive Public Transport System

Comprehensive transport system connecting the three cities as a whole will strengthen the communication of each other. The high frequency of communication in every field is beneficial for narrowing the disparity in Beijing megacity to reach the balanced development in this region. So the comprehensive public transport system is needed in the polycentric development of Beijing megacity.

Beijing megacity has been the one of the densest transportation system nationwide, covering the airline, railway, highway and pipeline and waterway. However, an integrated transport hub is still non-existed, which will hold-up the efficiency of traffic and the further development of the comprehensive transport system. Tianjin Port is the biggest comprehensive trading port in Northern China, and it has easy access to the vast hinterland in northwest and northeast of China. Tianjin municipality has primarily formed a transport network system, which is centred in harbour and also integrated by sea-land-air transportation. In addition, the recently built highway connecting the Beijing and Tianjin has overcome the obstacle concerning the distance, and the eighty percentages of export goods in Tianjin Port comes from Beijing municipality. It also has provided the favourable conditions to the further transport integration. Moreover, Tianjin airport is not far from Beijing international airport. The distance between the two airports is around 100 km, and makes it possible for Tianjin airport to be the permanent alternate airport and diversion airport for Beijing international airport. As a whole, Tianjin, from the aspects of traffic indicators, technical indicators, or various forms of transportation, possesses the potential of being the integrated transport hub for Beijing megacity.

The rail transport system has already played an important role in connecting the
Beijing and Tianjin municipality. The high-speed train has decreased the commuting time between Beijing and Tianjin to half an hour. Its minimum departure interval is three minutes, and maximum transport capacity is 18,000 persons per hour. However, this kind of high-speed train only exists between Beijing and Tianjin, the rail transport between Beijing and Tangshan remains relatively less efficient, which is disadvantageous to the megacity’s traffic integration. So the similar inter-city high-speed train could be introduced between Tangshan and Beijing. In addition, there are no direct railways connecting Beijing international airport with Tianjin and Tangshan currently. As the airport is one significant factor in regional development, the direct rapid link between Beijing International Airport, Tianjin and Tangshan could be built. Moreover, at present, it takes about two hours to travel between Beijing airport and Tianjin airports by car, so the railway or highway could directly link the two airports might also be needed. A stronger polycentric Beijing megacity needs more connections among all the three major centres. However, currently there are only normal-speed train between Tianjin and Tangshan and it takes at least one and a half hour to travel. Because the light rail needs the construction of new railway, the intercity train between Tangshan and Tianjin might be one option to be introduced. In this way, the intra-regional polycentric Beijing megacity would have a comprehensive rail transport network consisting of the normal-speed train, high-speed train and light rail.

As to the public transport management of Beijing Megacity, in order to control the use of private car, we can learn from Tokyo about its static management as we mentioned before, for example, the private car parking management. For Tokyo citizens, one of the preconditions of buying a car is having possessed a parking space, which is about US $400 per month. The fee for public parking in city centre is also expensive, at least US$ 6 per hour, almost ten times higher than that of Beijing. Another measure of management is that in every main metro station there is a free parking lot for bicycles, which could also encourage people to choose the
environmental-friendly bikes rather than the costly private cars. This experience can give us a clue that a transport provision in Beijing megacity could include that the private car parking fee has differentiation depending on different region and time. For example, in the place where the public traffic is developed or inner urban centre, the parking fee could be higher. To the transfer hub, the parking fee could be lower or even free to encourage people to stop there and take public transport. What is more, to make the public transportation more popular, we can learn from Tokyo to use the unified fare system among the different public transport means, which is more convenient and efficient for commuter transferring.

5.3.3 Labour Force Construction

Through the analysis of population in Beijing megacity, the situation could be concluded as three factors: the over large population base, the high density of population, and the uneven development of educated population. To cope with the negative population effect, Beijing megacity should strengthen the joint coordination and exchange experience.

Control population growth

Beijing megacity population has characteristics of high density and large number. Although with the help from implementation of the one-child policy, the population in Beijing megacity still grows excessively and cannot be coordinated with the economic increase. The over large number of population increases the load of infrastructure construction and aggravates the rate of unemployment. Its negative impact will be expanded. Undoubtedly, the temporary residents are not only helpful for the economic development with the decrease of labour cost, but also give Beijing megacity invisible pressure, for example, traffic pressure, infrastructure construction pressure. Under this condition, Hukou system needs to be implemented continuously for restricting the alien population flow, controlling the low educated
population flow into Beijing megacity and eliminating the negative effect on the economic development. At the same time, Hukou system also restricts the inflow of cheap labour force which occupies many important positions in urban construction, the employers will face the increasing cost of labour. Although it can decrease the less educated randomly to enter into labour market which is useful for building a high quality labour force, meanwhile, it also has influence on attracting talents who cannot enjoy fare welfare in Beijing megacity without local Hukou.

Labour Force Integration

Market competition means product competition, furthermore, the core of product competition is science and technology competition. Presently, high-tech products have occupied the most market share in the worldwide. All in all, it is talent competition. The labour force not only includes the simple manual labours, but also the high educated labour force.

The so-called labour force integration in Beijing megacity means the mobility of work force towards the needed regions and industries without barriers in Beijing megacity. Therefore, in the aspect of labour force mobility, the three cities’ governments should highlight the guidance and promote the flow to labour force orderly. For enterprises, once the lack of talents happens, even with sufficient capital, the economic development is hard to be continued. In the talent aspect, Beijing megacity should deepen the talent communication and strengthen the intra-regional talent exchange. To achieve this objective, the appropriate policies about talents exchange may need to be developed, and the various levels of labour flow need to be guided in order, in particular, decrease the rural surplus labour; Meanwhile, put emphasis on educating labour force, introducing talents, creating talent pool and constructing knowledge base. Incentive mechanism could be erected to encourage talents engaging in work fully and to realize the coordination of talents utilization in
Beijing megacity. At present days, Beijing, Tianjin and Tangshan have two main characteristics of labour force: firstly, surplus stock of labour resources with great employment pressure; secondly, Tangshan is lack of well-educated talents resources, so the big gap between Tangshan and the other two cities exists. The analysis points out that labour is no longer a key factor for the economic growth, on the contrary, it becomes an obstacle. Therefore, in order to promote economic development throughout the region, addressing the employment of surplus labour is a very important issue.

In Beijing, the proportion of labour force in primary industry is declining, meanwhile, the job opportunities are increasing in tertiary industry, so the labour force should be guided to the tertiary industry orderly. With the same reason in Tianjin, the employment rate in tertiary industry is higher than primary and secondary industries, and the labour force should also be suggested to move to the tertiary industry. Compared to Beijing and Tianjin, the economic development in Tangshan lags behind and work force is surplus in rural area. There is insufficient ability in absorbing labour force, in order to increase the employment rate, Tangshan could optimize the investment environment and attract capital flow with preferential policies for economic development, at the same time, attract the talents to work in Tangshan.

To solve the scarcity of talents in Tangshan, there are three ways. Firstly, through collaboration platform, Tangshan could strive to introduce the well-educated labour from Beijing and Tianjin where have affluent talents resource. Beijing and Tianjin actively cooperate with talents introduction strategy in Tangshan, encouraging the talent flow freely and orderly. To attract high-level professionals and talents, Tangshan could provide incentives and help them to start business.

Secondly, Tangshan could implement "flexible employment strategy". Fully use the geographical advantage with Beijing and Tangshan, the talents do not have to move
to Tangshan. For instance, the companies in Tangshan could ask talents in Beijing and Tianjin to provide technical service and convert research into productivity and they do not need to live in Tangshan. Because of the high-speed train construction, it could be realized. It is helpful for Tangshan to use high-level talents in the other two cities.

Thirdly, besides the usage of the well-educated labour force in Beijing and Tianjin, Tangshan could cultivate its own talents. Tangshan could develop vocational and skill training schools for educating the labour force equipped with the needs.

5.3.4 Adjustment of Industrial Pattern

Since the foundation of China, the administrative division has aggravated the unhealthy competition among the cities, and the local protectism has restricted the regional cooperation, leading to the same industrial structure in every city seriously.

At the beginning, Beijing was under the guiding ideology which was to construct Beijing as a production city, putting emphasis on developing heavy and chemical industries and reducing the need of industrial products from surrounding cities. Therefore, the relationship between Beijing and surrounding cities became increasingly alienated.

The unhealthy competition among cities and the self-enclosed development model not only inhibited the development of cities around Beijing, but also it was not beneficial for the Beijing itself. It resulted in shortage of land-use, population congestion, environmental pollution, traffic congestion and others such kinds of serious urban development problems in Beijing. Nevertheless, over-concentrated and vast functions impeded Beijing to play its functions effectively.
The idea of giving consideration of every city’s characteristics in polycentric Beijing megacity and making a division the functions are as follows:

As the capital, Beijing is the political and cultural centre in China. It is the national transportation and communications hub, the centre for advanced factors of production such as talents, information, and technology. Therefore Beijing could fully play the roles of political and cultural centres and the international and domestic hub function. The efforts should be focused on the development of tertiary industry, especially the tourism, information services, real estate, finance and insurance industry, and educational industries. The core of secondary industry in Beijing could turn to the development of integrated circuit industry, software industry and other high-tech industries or urban industries such as printing industry. With the aim of easing the space pressure in development and promoting the upgrading of industrial structure and the common development in Beijing megacity, Beijing needs to adhere to the principle of quitting. According to the other cities’ conditions, Beijing can transfer the existing automobile industry, heavy machinery to Tianjin. Some building materials industry and machinery industry can be moved to Tangshan.

Tianjin is the birthplace of modern industry in China. Its industrial strength and business efficiency is relatively high, in particular, with the large harbour boasting magnificent transport function in Tianjin. The harbour area is large and has good conditions for development. Tianjin Binhai International Airport is the second largest civilian airport in Beijing megacity and the largest air cargo transportation centre in China. Until now, the usage rate of this airport is still less than 3%. Although Beijing International Airport is a modern and integrated airport which is China’s largest air operation centre and communication centre connecting Beijing with most of domestic and foreign cities, it is not appropriate to be an integrated air hub in Beijing megacity considering the industry layout in this region. In the future, based on the
reasonable function division in Beijing megacity, the three cities could strengthen
joint cooperation in airports, roads and harbours. Such cooperation could not only
relieve the pressure of cargo and people transportation, but also make full use of
Tianjin transportation capacity. Tianjin could be built as an international port city, to
play an important role in international port and industrial cargo transport centre
functions. Because Tianjin has a good industrial base, highlighting the coordination in
industry layout in Beijing megacity and moving inappropriate industries from Beijing
to Tianjin, for instance, heavy industries and traditional industries which have
relatively favourable conditions in Tianjin. At the same time, strengthening the
functions of foreign trade, and making efforts on developing export-oriented tertiary
industries, such as machinery, electronics and other high-tech technology industries.

Because of historical reasons, metallurgical, chemical, oil refining and other heavy
industries became basic industries in Beijing. However, Beijing with its lack of coal,
iron ore, petroleum and water resource is not suitable for those industries. These
heavy industries consume vast water, land, energy and transport capacities which
are not favorable for Beijing’s development. Tangshan is an important energy and
raw material industrial base in Northern China with abundant mineral resources and
building materials. It can be considered as the heavy industry centre in Beijing
megacity, strengthening metallurgical, building materials, chemical, electrical and
mechanical industries. Tangshan could be a major re-processing heavy industry base
in Beijing megacity and the base for providing raw materials. The favourable way to
support these industries’ development is to build economic zones in Tangshan,
similar to those in Beijing and Tianjin. Currently, Tianjin Costal Economic Zone and
Beijing ZGC enjoy preferential policies in the field of taxes, land-use and
infrastructure construction. These economic zones have been a powerful force for
stimulating the local economy.
To sum, Beijing could be developed as a research and development centre, Tianjin and Tangshan could be developed as transport centres and industrial production centres.
6. Conclusion

Since the 21st century, metropolitan region has become a hot topic in the worldwide, due to its economic and social effect on the regional development. Megacity, defined as a metropolitan region with more than 10 million people has appeared and represented the contribution of urbanisation. The megacity transcends the average metropolitan region with the inestimable influence on itself and the nearby cities. In this thesis we studied the polycentric Beijing megacity which not only includes Beijing but also Tianjin and Tangshan as a case, and use Tokyo megacity and LA megacity as examples for learning experience and lessons.

Today, the monocentric Beijing has several serious negative features threatening its development. These negative features accelerate the development of the polycentric Beijing megacity. Firstly, the monocentric Beijing megacity has the pressure in multi-dimensional development. As the capital of China, Beijing cannot afford excessive pressure; secondly, with the stunning speed of the increasing number of cars and population, and the concentric spatial city pattern, traffic congestion becomes a chronic disease in monocentric Beijing. Thirdly, the increasing environmental problems become increasingly serious. Fourthly, urbanisation and the scarcity of land-use contaminate the cultural relics and historic sites in the city which represent the ancient intellectual crystals.

Tokyo and Los Angeles, as pioneers in the urbanisation process, have become megacities in last century. To solve the problems which monocentric Beijing is facing, there is much experience can be learned from them. Tokyo implemented three strategies, ‘Setup plan for Tokyo Metropolis’ created three new centres for easing the high land price, traffic jam, and environmental issues in the city centre; ‘Tokyo Metropolis long-term plan’ promoted to move the educational and researching facilities to the outside of Tokyo and establish three more centres for decreasing the
stress and achieving more balanced functions of the CBD; ‘ideas for establishing the waterfront development centre’ developed coastal area for expanding the business and commercial space to meet the increasing demand of the international business activities. These three strategies resolved the monocentric Tokyo’s problems effectively and helped to form the polycentric Tokyo, and bring some experience for the monocentric Beijing. Therefore, Tianjin and Tangshan are considered as the major parts of the polycentric Beijing megacity, the two new centre cities with respective characters which are not only useful for polycentric Beijing, but also fantastic for the development of them. Beijing, Tianjin and Tangshan form the polycentric Beijing megacity, and the three cities have the advantaged physical connection and good related infrastructure. LA megacity, instead of being governed by the traditional institutional mechanisms, is governed by the joint power authorities sponsored by governments which are meaningful in providing effective mechanisms for implementing projects and programs. It gives the experience for Beijing megacity to learn and complement its governance and coordination.

To reinforce the balanced development in polycentric Beijing megacity, four main approaches were proposed. First one is to establish the coordinative mechanism in Beijing megacity to support its polycentric development. The second one is to build comprehensive public transport system which is beneficial for the regional integrated development in every field. The third one is to control population growth and strengthen the labour force integration in polycentric Beijing megacity, which is favourable to upgrade the quality of the labour force in Tangshan. Fourthly, adjust industrial pattern in Beijing megacity, which means Beijing municipality transfers the automobile industry, heavy machinery to Tianjin which boasts great conditions for heavy industry development conditions with the help from government. Some building materials industry and machinery industry will be moved to Tangshan where has abundant natural resources. Optimizing the industrial patterns will realize the win-win-win pattern in Beijing megacity.
A Polycentric Beijing megacity is a typical example for the Chinese metropolitan regions, and its balanced development will have great influence on Chinese urbanisation process.
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