



# From development zones to edge urban areas in China: A case study of Nansha, Guangzhou City

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## ABSTRACT

The new millennium signified a new phase in the development zone-oriented suburbanization of China. Spurred by a new round of urban development strategies, development zones in many large cities face a need for enormous transformations and re-development. These areas have often been compared with the Western concept of “edge cities”, although in this paper we argue that this “imported” concept, in practice, bears little resemblance to the actual development tendencies in China. Taking a comparative approach, this paper presents a critical examination of edge urban formations in the Chinese context, and identifies the major differences between the concept in China and the United States. Drawing upon a case study of Nansha in Guangzhou, the unique paths and underlying dynamics driving these transformations are revealed. It is concluded that Chinese edge urban areas are being transformed from mono-function development zones into new fully functional cities. A city in China like Nansha reveals the dynamics of both state interventions and local actions in boosting the polycentric economies of large city regions.

## 1. Introduction

Despite widespread outward suburbanization, which has been witnessed in many Western countries since the 1960s, another phenomenon has been observed in the form of agglomerations in city regions. With the conversion of city functions and the reorganization of urban space, the urban spatial structure has undergone a gradual change from a monocentric to polycentric form, with new settlements emerging in the suburbs. These settlements with various terms have been taken as one of the definitions or major representations of post-suburbia. Among them, the term edge city “takes its place in a welter of terminology deployed to help chart the complexity of modern forms of ur-

banization” (Phelps and Parsons, 2003, page 1726). Garreau (1991) described this as the third phase of American suburban development in the 20th century, and coined the term “Edge City” to describe the phenomenon. Subsequently, and based mainly on Garreau's definitions, edge cities have been identified in many different county contexts, including Europe, Southeast Asia and South Africa. Although differences exist, it has been argued that edge urban settlements, like American edge cities, have become a part of a polycentric model trying to promote rational expansion within Western metropolitan areas. This phenomenon has even been described as representing the advent of a post-suburban era (Wu and Phelps, 2011). In contrast, studies into suburban settlements of this kind are still in their initial stages in China, with little research having been made to date. AL-

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though the terminology has been appropriated and imported (Zhao and Peng, 2000; Song and Wang, 2001; Yuan and Wang, 2010), the characteristics and processes of development have yet to be systematically understood and explored. Recent studies on the development of urban fringe or the peri-urban areas have mainly focused on megacities like Beijing (Huang et al., 2017; Zhao, 2011; Zhao, 2013; Zhao, 2017) and Shanghai (Tian et al., 2017). This paper therefore presents a critical evaluation of the nature of edge urban areas within the specific context of China, aiming to provide an understanding of whether new types of cities are emerging in the Chinese context, and if so, what are the main characteristics of Chinese edge urban areas. To this end, a case study is made of Nansha in Guangzhou City (another major megacities in China) to examine the growth of one particular example of a city that is emerging in edge urban areas in China.

In China, urban spatial expansion has been mainly the result of specific central planning efforts of the national government. In 1984, 14 national development zones were set up on the periphery of Chinese coastal cities, stimulating the construction of further large-scale development zones across the country, and this has been one of the primary means of urban and industrial restructuring and economic development. Established as a result of designed industrial relocation to the suburbs, early development zones emerged not only as industrial spaces at the urban-rural fringe of metropolitan areas, but also isolated “islands” with a loose attachment to the central cities. Development zones came to dominate the suburban landscape of Chinese cities in the late 1980s and 1990s, and after more than 20 years, they can today be recognized as the physical manifestation of a process of remarkable economic growth. That said, their futures are perhaps less secure, as they have been heavily dependent on foreign investments, while a slowdown of economic growth has resulted in resource bottlenecks.

More recently, suburbanization development in China has entered into a new era, and development zones are also entering a period of strategic transformation and re-development. The 11th Five-Year Plan of Economic and Social Development of National Economic and Technological Development Zones (Ministry of Commerce and Ministry of Land and Resources, 2006) aims to adjust the position of development zones by transforming them into multi-functional integrated industrial areas. Under the confluence of both the external environment and internal demands, a re-development of development zones has begun with the creation of new types of Chinese cities. This reflects the polycentric development strategies of many Chinese metropolitan areas, in which employment or business centers are promoted in order to help form polycentric structures. Edge urban areas are emerging as new centers, and are becoming a new model for the encouragement of rational urban expansion. This research uncovers some interesting and novel features of the processes by which cities on the edge or periphery of core cities are emerging. It is believed that Chinese edge urban formations can provide a better understanding of this new mode of (post)suburban development, which features strong state interventions and increased local capacity in promoting polycentric urban economies.

Following this introduction, the paper first reviews relevant literature on edge urban formations in the era of (post)suburbia. It continues with two interconnected sections that present a systematic study of Chinese edge urban

areas. The first section discusses different stages of Chinese suburban development and summarizes the main characteristics of Chinese edge urban areas and their transformation using the cases from seven large cities in the Bo Hai Coastal, Yangtze River Delta and Pearl River Delta Regions. The following section presents a detailed case study of Nansha to illustrate the underlying dynamics and development processes behind the transformation from a development zone into a unique Chinese city.

## 2. Edge urban formations in the era of (post)suburbia

There is an increasing literature that has been studying the new and diverse settlement space which helps shaping and reshaping the traditional suburban areas. The term post-suburbia was proposed to capture this new phenomenon and has gained wider acceptance more recently. It has been reflected in an academic discourse defining it as a new era (Essex and Brown, 1997; Lucy and Philips, 1997; Wu and Phelps, 2011), a new category of settlements (Kling et al., 1995; Teaford, 1997), and the distinctive urban politics (Phelps and Wood, 2011). In one recent review of post-suburban growth, it was noted that “when the term ‘post-suburbia’ has been used it has been used in rather different ways” (Phelps et al., 2010, page 369), which exists as an open question without being fully understood and determined (Nüssli and Schmid, 2016). Various settlement types termed “edge city” (Garreau, 1991), “edgeless city” (Lang, 2003) and “technoburb” (Fishman, 1987) etc., “are taken to signal something different from suburbia” (Phelps and Wood, 2011, page 2591), and have been used to describe the complex form of urban expansion and changes to traditional suburban elements (Wu and Phelps, 2011). In China, the recent phase of suburban development has included important elements which could be considered as post-suburbia (Wu and Phelps, 2008; Wu and Phelps, 2011), and new settlements are also emerging at the edge of major cities, which share a certain degree of similarity to the US edge cities. However, it should be understood that the concept of an “edge city” was originally proposed based on the development background of US cities, and whether or not it can be applied outside the US context in mixed economy settings such as Western Europe, let alone state-transitional economies such as China, needs further exploration.

The existing literature has pointed out some of the limits in applying the term edge city outside the US (Bontje and Burdack, 2005; Phelps, 1998; Phelps and Parsons, 2003; Phelps et al., 2006; Wu and Phelps, 2008). Therefore, in view of the context specific feature of the term edge city, this paper avoids applying the exact term to China. Rather, in light of the new type of urban formations transformed from traditional development zones on the edge or periphery of core cities, and in light of this new type of settlements also represent some elements of post-suburban growth in China, the term edge urban areas is preferred in the paper to distinguish this new type of cities emerging on the edge from the US edge cities. Using edge urban areas emphasizes their two key features, edge (in terms of location) and city (in terms of function), which are also the two defining words of US edge cities, demonstrating the similar outcome of recent (post)suburban development both in China and the US. Although the emerging edge urban areas in China have significant differences specifically in morpho-

logical aspects and also some of the functional aspects compared with US edge cities, they conform to some of the defining criteria and in particular both of the settlements are functionally similar in being employment centers at the edge of core cities. As it is observed, "it is the morphology of edge cities, and not Garreau's (1991) five defining criteria, that most defines these settlements as specific to the US" (Wu and Phelps, 2008, page 466). The similar outcome and some of the similar functional features between US edge cities and China's edge urban areas make it appropriate to compare them in other respects, in order to capture some new trends/features in the (post)suburban development of Chinese large cities. As Bontje and Burdack (2005, page 317) noted in European context that "recent development tendencies in European metropolitan regions bear resemblance to Edge City development in several respects", but "the European Edge Cities are not mere copies of their American counterparts". Likewise, edge urban areas in China are also worthy examining more fully. There is thus a need to first review the formation of edge cities in the Western countries during the (post)suburbanization process, and the so-called Chinese edge cities (*bianyuan chengshi*) which is translated literally, usually meaning cities on the edge before moving on to a comparative analysis later in the paper.

In the United States, following the suburbanization and "mall-ing" of the country, a large number of jobs in the service sectors moved out to the suburbs, leading to the gradual formation of functional edge cities. The term "edge city" was first coined by Garreau (1991), a Washington Post journalist, to describe the substantial new non-contiguous urban development at the edge of established major cities in the United States, believing that Americans were creating a new future, having changed nearly all the routines associated with living, working, communicating and playing. These new multiple urban centers, or "edge cities", contain all the functions a city, but are located far from the old downtown on land that 30 years ago was at the edge of the city, and occupied by villages or farmland.

Following Garreau's coining of the term "edge cities", several researchers have adopted the concept and have attempted to conceptualize it more clearly. Byrum (1992) Nelson (1993), Stern and Marsh (1997) tried to make a more accurate definition of the idea, while Scheer and Petkov (1998) McKee and McKee (2001), Bingham and Kimble (1995), among others, came up with different typologies in an attempt to classify different types of edge city. Case studies have focused mainly on the United States (Jonas, 1999; Dietsch, 2001; Bingham and Kimble, 1995; Nelson, 1993; McGovern, 1998) and Europe (Phelps, 1998; Meikie and Atkinson, 1997; Begg and Kitson, 1991; Stern and Marsh, 1997; Holden and Turner, 1997; Kloosterman and Musterd, 2001), and although American and European edge cities have some common characteristics, the process by which they developed have been quite different. The development of US edge cities was spurred initially by the market and its most capable assistant, developers, rather than by state interventions (Bontje and Burdack, 2005), although their further development depended on the guidance and control of the government and the relevant planning authorities. Unlike US edge cities, which could be seen as growing organically, European edge cities owe their origins largely to public or state planning, with both national and local governments, as well as other public sector agen-

cies, playing a key role in their formation (Stanback, 1991). Central governments in Europe had more power and institutional capacity, and were often large landowners in their own right (Harding, 1991; Harding, 1997), and so European edge cities should be considered as a "typically European" variation of the original edge city model (Bontje and Burdack, 2005). Although they do not meet all of Garreau's defining criteria for an edge city, they do meet some of the more important ones, being important job centers and at the forefront of new urbanization tendencies (Phelps et al., 2006). Beyond the US and European examples, only a few other studies of edge cities have been made elsewhere, such as Australia (Freestone, 1997), Thailand (Dick and Rimmer, 1998) and South Africa (Michel and Scott, 2005).

Sun and Ma (1997) first introduced the term edge city to China, but they were followed subsequently by others who used Western concepts to explore Chinese edge cities, focusing particularly on three areas of activity: preliminary studies and discussions on the identification and characteristics of Chinese edge cities (Deng et al., 2001; Zheng and Meng, 2012); the urban spatial structure of edge cities (Wang et al., 2001; Li et al., 2008; Zheng, 2010); and the planning and construction of development zones based on the concept of edge cities (Zhao and Peng, 2000; Song and Wang, 2001; Yuan and Wang, 2010; Liu and Bu, 2013). Interestingly, compared to Western countries, the extensive development and construction in the suburbs has not resulted in or exacerbated a decline in the central areas of large Chinese cities. Indeed, in parallel with the growth of "edge cities", in some cases the central areas have been able to maintain, and sometimes enhance, their original vitality. Furthermore, for many Chinese cities have not experienced large-scale suburbanization, the establishment of edge cities has not relied on traditional population migration patterns (Chen, 2009). It can thus be argued that the development process and underlying dynamics behind edge cities are different between China and Western countries, although they share many similarities in terms of the type, characteristics and industrial structures. Chinese edge cities provide a useful perspective for understanding the recent transformation of China's suburban areas, as well as the dynamics facilitating that transformation.

There is a common understanding in literature that edge cities are new settlements that are based predominately on employment rather than living. They are seen as unconventional products of (post-)suburbanization and have become a part of the polycentric model used to try to encourage balanced development within city regions in the West, especially in terms of promoting functional balance and spatial integration (Burger et al., 2011; Burger and Meijers, 2012; Vasanen, 2013; Lambregts, 2009; Burger, 2011). In China, research on edge cities emerging on the edge areas has, to date, tended to focus on the defining characteristics of these places rather than the processes that facilitated their development. As Phelps (2012: 692) stated, the evolution of edge cities is a worthy subject for study in terms of what it may tell us about potentially significant transformations in societal values and the processes of urbanization. This paper will focus on one type of Chinese edge urban areas, transformed from development zones into cities, which have emerged in some large Chinese cities and have attracted attention due to their uniqueness within the Chinese context. Other types of Chinese edge urban settlements/areas can be categorized as newly planned suburban central towns (Tao

and Liu,2003); suburban secondary centers that developed out of residential areas (Huang,2010); cities based on emerging suburban economic cores such as suburban superstores, outer suburban holiday villages or mega university towns; etc. (Meng,2008). By exploring the main characteristics and defining criteria of development zone-oriented edge urban areas, and supported by a case study, this paper attempts to offer a valuable window onto recent processes in Chinese (post)suburbanization and development zones, while also addressing some of the key issues in this transformative process.

The remainder of the paper includes both a general and an in-depth analysis of the emerging development zone-oriented edge urban areas in China. To this end, the first stage is to establish the defining criteria for development zone-oriented edge urban areas to examine the extent to which these criteria can be used in a general way to characterize these settlements. Focus in this regards will be on seven selected development zones in Beijing, Tianjin, Dalian, Qingdao, Shenyang, Hangzhou and Guangzhou within the Bohai Sea, Yangtze River Delta and Pearl River Delta regions. As the emergence of edge urban areas relates to the development stage of central cities, seven development zones have been selected from three regions in China as representative of the most developed areas in the country. The data used to identify edge urban areas within these development zones is drawn from various sources, including National Economic and Social Development Statistics Bulletins, master and strategic plans from these seven large cities, and China's economic and development zone websites. The second part of the analysis focuses on one specific case to understand the dynamic processes that underline this contextually unique phenomenon. The analysis relies mainly on interviews conducted with key stakeholders, including government officials, planners and public consultants who participated in the municipal and local planning schemes (see Table 1), and on related documents that include past and current master plans and strategic plans, National Economic and Social Development Statistics Bulletins for Nansha, Investment Environment Analysis Reports of the Nansha Development Zone and other relevant research reports and proposals.

**Table 1**  
List of interviews in 2015.

	Dates	Interviewees
Guangzhou municipal level	March 18/24/25, 2015	3 planners/senior planners
	March 31, 2015	1 academic
	March 17/25, 2015	2 division directors
	April 3, 2015	1 center director
Nansha local level	April 22/23/30, 2015	3 government officials
	April 22, 2015	2 planners and consultants
	May 12/20, 2015	2 entrepreneurs
	May 05/06, 2015	2 community directors

### 3. Characterizing development zone-oriented edge urban areas in China

In this section, a brief discussion will be made of the main characteristics of development zone-oriented edge urban areas in China, beginning with a review of the different stages in the Chinese suburbanization process from which Chinese edge urban areas emerged. In the following stage, based on the two key features of development zone-oriented edge urban areas — edge (in terms of location) and city (in terms of function), we draw from Garreau's functional defining criteria for American edge cities and other relevant research on edge urban settlements, and translate them into a set of criteria for China, applying the unique indicators for the measurement of China's development zones and adopting Chinese specific data. The characteristics of development zone-oriented edge urban areas are summarized in the final part.

#### 3.1. Suburbanization and the emergence of development zone-oriented edge urban areas in China

The suburbanization of US cities followed a staged process, from residential suburbanization to industrial suburbanization, after which, with the suburbanization of jobs, fully functioning edge cities emerged. During the initial stages of the formation of edge cities, it was the market and private developers that were the decisive players, but once edge cities had obtained development momentum, local government began to play an increasingly important role in shaping change (Bontje and Burdack, 2005). However, this pattern and process was not followed in China, which has not yet entered large-scale suburbanization development. The process of rapid urban expansion in some large and medium-sized cities has enabled the formation of new settlements in the suburbs or even outer suburbs. Research into Chinese suburbanization and suburban development can be said to have started in the mid-1990s (Feng, 2001; Feng, 2002). Generally speaking, the history of Chinese suburban development can be divided into four main stages (Cheng et al., 2012). The first stage was an industry-oriented state-led suburbanization effort aimed at industrialization that lasted from 1949 to 1979. The second stage emerged at the beginning of the 1980s, when the industrial suburbanization deepened and was accompanied by passive population migration to the suburbs. The third stage began in the 1990s and combined several coexisting trends of suburban development, and was accompanied by a period of active population migration. More recently, in 2000 Chinese suburban development entered a new phase in which the transformation and re-development of suburban development zones has spurred the formation of new suburban centers. As a result, China's larger cities have begun to take on a more polycentric structure, and this has become one of the main features of Chinese suburbanization. In all of these processes, the government and the market have played different roles at different stages. Even though suburban development in China is quite different from that seen in Western countries in terms of the route followed, the outcomes of Chinese suburbanization have turned out to be similar to those in Western cities, as gradually formed new suburban centers or edge urban areas with more polycentric urban structures.

A preliminary comparison of US edge cities and new edge urban areas in China reveals several similarities. First, both are the products of urban functional conversion and urban spatial reconstruction; second, both experienced a development process from villages/rural areas to single functional areas (in North America, this was mainly a residential function, while in China it was mainly industrial), and then further into new multi-functional urban areas. Third, together with other edge urban areas and downtown areas, they help promote more balanced spatial structures across metropolitan areas. Finally, in both examples, the edge cities and edge urban areas are still growing, and so their final development status remains to be seen.

### 3.2. Identifying development zone-oriented edge urban areas in China

According to the key features of Chinese development zone-oriented edge urban areas, they need to fulfill two main criteria (edge and city), the first of which relates to their physical location, in that they should be seen as a satellite or on the edge of the core city. For the second criteria, Garreau's five functional criteria are taken as a reference to ascertain whether these settlements could be defined as multifunctional cities:

- The city should have 5 million square feet or more of rentable office space;
- The city should have 600,000 square feet or more of leasable retail space;
- The city should have more jobs than bedrooms;
- The settlement should be perceived by the population as an identifiable place; and,
- It should be nothing like a city 30 years ago (Garreau, 1991).

In China, it has been suggested that the emerging new suburban and outer suburban settlements are linked with “a complex mix of elements”, which “are commonly associated with post-suburbia — employment activities and luxury residential developments, civic functions and amenities” (Wu and Phelps, 2011, page 415). Using the above as a framework, Table 2 identifies the translation of these characteris-

**Table 2**  
The main research elements identifying development zone-oriented edge urban areas in China.

Origins of elements	Main research elements
<i>Edge</i>	development stage of central cities spatial locations of development zones urban spatial morphology
<i>City and five functional defining criteria</i>	degree of employment-to-population balance (number of jobs & residential population) industrial structure proportion of increase in value of tertiary sector Time taken for development into a “city”

tics within the unique context of what we called development zone-oriented edge urban areas in China.

Chinese edge urban areas are associated with civic functions and amenities. Meanwhile, it is clear that it was Garreau's intention to focus on the scale of producer and consumer services to evaluate both the scale and mix of industrial development in edge cities. Accordingly, this research will examine the industrial structure and industrial development level of development zone-oriented edge urban areas by taking the proportion of the increase in value in the tertiary sector and comparing it with the general criteria of existing and established Chinese cities. In 1993, the State Council of China approved a set of criteria to be used to ascribe different levels of city status in different contexts. For a county-level city, one of the indicators used in the designation was that the contribution of the tertiary sector to Gross Domestic Product (GDP) should be more than 20%, while for a prefecture-level city the tertiary sector should be more dominant, being more important than the primary sector and contributing more than 35% of GDP. This research will use these thresholds to establish whether or not new cities have been created within China.

Similar with Chinese edge urban areas in being employment centers, Garreau believed that a mature edge city should be able to provide more jobs than its residential population, and so should be a job center. Fishman (1987) and Teaford (1997) also proposed a greater working-living balance in the emerging post-suburban settlements. Following this path, this research will use the number of jobs and the residential population to evaluate the current degree of employment-to-population balance in development zone-oriented edge urban areas. For the final two defining criteria, two elements will be selected for comparison: First, the urban spatial morphology, i.e. whether or not they are perceived by people as to have been, or on the way to becoming, secondary centers within metropolitan areas; and second, the time taken for development zones to develop into a “city”.

In addition, development zones will transform into Chinese edge urban areas as long as the central or core cities are in the process of development from agglomeration to dispersal, which can also be seen when central cities are undergoing a process of suburbanization. In this regard, one important element in the selection of a development zone should be the stage of development of the central city.

Previous discussions of the criteria used to evaluate development zone-oriented edge urban areas have focused around two themes: *Edge*, based on development stage of central cities and the spatial locations of the new development zones; and *City*, drawing from Garreau's five functional defining criteria and other relevant research on edge urban settlements, notably urban spatial morphology, the current degree of employment-to-population balance, industrial structure, proportion of the increase in value of the tertiary sector and the time taken for development into a “city” (Table 2).

### 3.3. The characteristics of development zone-oriented edge urban areas

As mentioned earlier, China features other types of edge urban settlement/area, like newly planned suburban central towns, suburban secondary centers that developed out of residential areas, and cities based on emerging suburban

economic cores. This research focuses mainly on development zone-oriented edge urban areas, due mainly to their uniqueness in large Chinese city regions and their wider implications to China's (post)suburban development. At present, Chinese development zones are classified into two types, national level development zones and provincial level development zones. The higher development zones stand a better chance of transforming into new fully functional urban centers, given that they are able to benefit more from national, provincial as well as city-level resources. Furthermore, at the beginning of 21st century a new trend emerged in the economic development and spatial integration of metropolitan areas, with development zones being promoted as fully functional edge urban areas as a key spatial strategy, as revealed in their master plans. Considering the above situation, national development zones were selected as the research subjects for this study, and so all of the selected development zones are National Economic and Technological Development Zones (NETDZs). It has been more than 30 years since the first NETDZ was established (1984), and in order to identify whether they have been fully transformed, a time period of at least 10 years since establishment is essential. In this regard, all 53 NETDZs that were established before 2005 are identified, among which 23 are located within the Bohai Sea, Yangtze River Delta and Pearl River Delta regions. A further selection is made from these 23 NETDZs based on two criteria in accordance with the background and aims of this paper:

1. The transformative trends of development zones have been mentioned in the master plans (since 2000) of their respective central cities; and
2. There is currently no evident agglomeration development between development zones and the central urban areas of their respective large cities.

The final sample comprises seven NETDZs within seven large metropolitan areas (Beijing, Tianjin, Dalian, Qingdao, Shenyang, Hangzhou and Guangzhou), which will be studied to investigate the main elements of development zone-oriented edge urban areas. An analysis of master plans since 2000 of the seven listed cities reveals that existing development zones have, on the whole, tended to transform into more comprehensive Chinese edge urban areas, meaning that urban spatial structures are becoming more polycentric. Details of these transformative trends of seven development zones are illustrated in Table 3, while Fig. 1 shows the locations of the seven selected cities of Beijing, Tianjin, Dalian, Qingdao, Shenyang, Hangzhou and Guangzhou.

*Sources:* City Master Plans of seven large cities obtained from Urban Planning Bureaus or their official websites.

In the following stage, an empirical analysis is carried out on Chinese edge urban areas within the seven selected large cities using the main research elements identified above. Each of the research elements is examined for the seven development zones to summarize their main characteristics as emerging or mature edge urban areas (Cheng et al., 2012). The major characteristics of the seven NETDZs are summarized in Table 4.

*Sources:* 2014 comparative analysis report on Guangzhou Economic-Technological Development Area and other main NETDZs, Guangzhou development district official website; 2013 quarterly data of NETDZs, Ministry of Commerce of the People's Republic of China; 2013 national economic data

of Hangzhou Economic-Technological Development Area, www.HEDA.gov.cn; 2014 National Economic and Social Development Statistics Bulletins of Nansha, Nansha Statistical Bureau; The third national economic census bulletins of Beijing, Dalian, Huangdao district (Qingdao city), Nansha district (2013), Statistical Bureaus of Beijing, Dalian, Huangdao district (Qingdao city) and Nansha; 2013 Statistics Bulletins of TEDA, TEDA Development and Reform Bureau; 2007 comparative analysis report of main economic data on NETDZs, Ministry of Commerce of the People's Republic of China; The 12th Five-year Plan of National Economic and Social Development of TEDA, Administration committee of TEDA; www.dl.gov.cn; The sixth census data of Qingdao City (2010), Qingdao Statistical Bureau; 2011 National Economic and Social Development Statistics Bulletins of HEDA, Administration committee of HEDA; The sixth census data of Guangzhou City (2010), Guangzhou Statistical Bureau; Official websites of seven NETDZs.

Comparing this data with the defining criteria of American edge cities results in a set of defining criteria for Chinese examples. The similarities and differences between the defining criteria of Chinese development zone-oriented edge urban areas and American edge cities are summarized in Table 5.

#### 4. A case study of Nansha, Guangzhou city

This research presents an in-depth study of one of Guangzhou's formal development zones, Nansha, to investigate the main characteristics and underlying dynamics in its transformation into a Chinese edge urban area. Guangzhou is located at the center of the Pearl River Delta (Fig. 2), and has become the third biggest urban economy in China. The selection of Nansha for an individual case study was based mainly on the research elements summarized for seven NETDZs in Table 4. As discussed in previous sections, one of the most prominent characteristics of Chinese edge urban areas is a relatively even employment-to-population balance. The Nansha development zone tends to be more mature in this regard (jobs to residential population ratio: 1.45), while the Beijing, Tianjin and Qingdao development zones have a positive jobs to residential population ratio, and the Dalian, Shenyang, Hangzhou development zones have a negative jobs to residential population ratio. This is a further reason for the selection of Nansha development zone for further analysis. Although it can at present only be referred to as an emerging edge urban area (proportion of increase in value of tertiary industry in GDP just over 20%) and has only gone through 10 years of transformative development, its working-living ratio indicates Nansha's significance in exploring the differences between Chinese edge urban areas and American edge cities in terms of development processes and dominant dynamics. In the following analysis, we first embed Nansha in a broader context of Guangzhou and take a brief look at the evolution of Guangzhou's urban spatial structure. In the following stage, focus is on Nansha's transformative process from a development zone into a fully functional "city" and the different mechanisms at work during the four development stages.

##### 1.1. Overview of Guangzhou's urban spatial structure evolution

- (1) Monocentric spatial structure (1978–2000)

**Table 3**

Transformative trends from development zones to edge urban areas under the new round of city regional development strategy in seven Chinese large cities.

City	City Master Plans	Spatial structure	Transformative trends of development zones
Beijing	Beijing City Master Plan (2004–2020)	Two axes - two belts - multi-centers	Yizhuang (in which BDA is located) will become an important node in Beijing's eastern development belt. Improvements to comprehensive service functions will enable its transformation from development zone to a comprehensive industrial new town.
Tianjin	Tianjin City Master Plan (2005–2020)	One axis-two belts-three zones	As the core area of Binhai New Area, TEDA will become the portal of northern China opening to the outside world. A high level modern manufacturing and research base, as well as a livable and ecological new urban district.
Dalian	Dalian City Master Plan (2009–2020)	Clustered structure of one core-two urban districts- three bays	Dalian Economic-Technological Development Area merged with Jinzhou district to become Jinzhou New District. As one of the two future "new urban districts" of Dalian, Jinzhou new district will be committed to achieve complementary and coordinated development with the core area.
Qingdao	Qingdao City Master Plan (2006–2020)	Relying on the central city, developing along the bay, a clustered structure with axial extensions	Qingdao Economic-Technological Development Area will be one of two sub-centers of Qingdao. It will become an international shipping center for northeast Asia, a logistics and trading center, a tourist resort, a modern manufacturing base and the central district of the western coastal area.
Shenyang	Adjustment on Shenyang City Master Plan (2010 – 2020)	From monocentric concentration to polycentric and sustainable development pattern	Tiexi new district (in which Shenyang Economic-Technological Development Area is located) is a future new district of the Shenyang city region. Its future development relies on co-operations between the development zone and Tiexi district.
Hangzhou	Hangzhou City Master Plan (2001 – 2020)	One core-two circles, three axes-two corridors, one ring-multi-centers	Xiasha district (in which HEDA is located) will develop on the basis of hi-tech industries and advanced manufacturing industries, and will transform to an ecological modernized new town with comprehensive functions such as education and scientific research, business and residence.
Guangzhou	Guangzhou City Master Plan (2011 – 2020)	Polycentric, clustered and networked structure	Guangzhou's stated its spatial development strategies are "southward expansion, northward optimization, eastward extension, westward combination and central adjustment". Nansha new district (in which Nansha Economic-Technological Development Area is located) is one of the six sub-centers within Guangzhou city region.

With the implementation of the open-door policy in 1978, industries producing heavy pollution and consuming large amounts of energy were moved gradually to Guangzhou's suburbs in order to free up land and space for the development of tertiary industries (Yang, 2010). The suburban development of Guangzhou in this period was mainly a passive relocation of industries and population, while the central areas remained very compact. The 14th round of the Guangzhou City Master Plan in 1984 failed to move the city center out of the old urban areas, leaving behind administrative, commercial, residential and other functions, and resulting in an increasingly dense population and a heavy concentration of urban functions (Li et al., 2001). With constraints on the further expansion of central areas and increased congestion, the drawbacks of the monocentric model were all too evident. By 2000, it had become apparent that the development and expansion of Guangzhou as a single city was not possible due to insurmountable natural barriers to the north and east and administrative boundaries to the west and south. In short, the city had no more space for further development (Zhuang et al., 2008).

## (2) A more polycentric development trend (2000–2004)

In 2000, a document entitled "Outline of Guangzhou City Overall Strategic Plan" made a breakthrough in Guangzhou's monocentric spatial structure, articulating a spatial development strategy of "southward expansion, northward optimization, eastward extension, westward combination" through the development of a number of interconnected nodes. As one interviewee indicated, "one of the most important planning ideas in the 2000 strategic plan was to pursue the polycentric and clustered development" (interview, division director, Guangzhou, March 2015). At the same time, the cities of Panyu and Huadu were given more power and responsibility by becoming districts, extending the territory over which the Guangzhou municipal government had jurisdiction to ten districts. This corresponded to an increase in Guangzhou's area of responsibility from 1,443km<sup>2</sup> to 3,718km<sup>2</sup>, providing a new opportunity for urban spatial expansion and a new urban sustainable development strategy (Yuan, 2008). Panyu and Huadu's re-designation as districts highlighted their advantages of lower

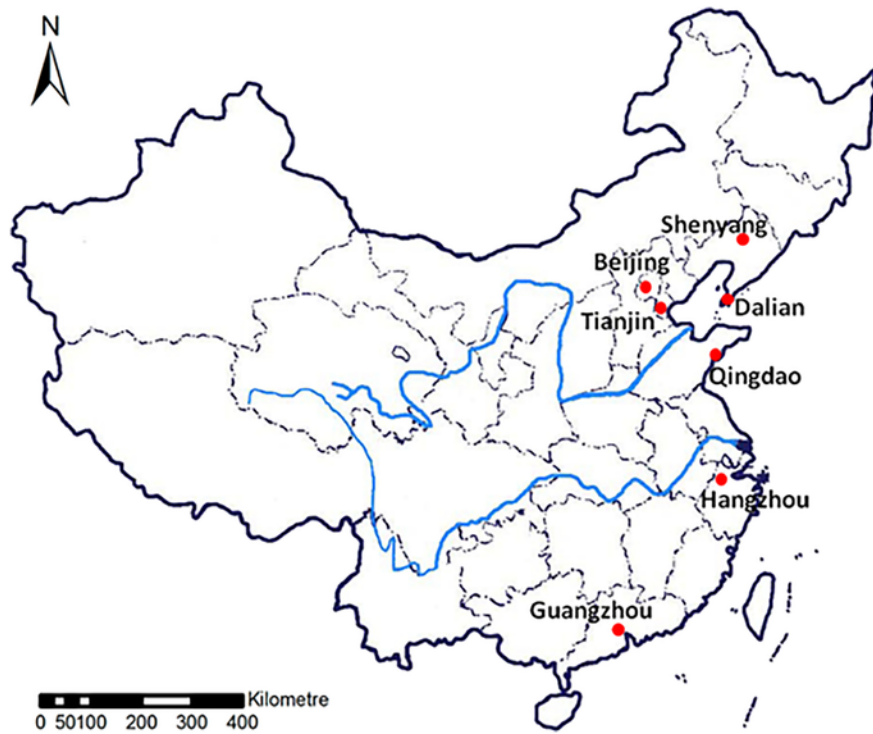


Fig. 1. Locations of seven selected large cities in China.

**Table 4**  
Research elements summarized for seven NETDZs in China.

Development zone	City	Proportions of tertiary industry increase value in GDP	Jobs divided by residential population	Year of Establishment	Start year of transformation
Beijing Economic-Technological Development Area	Beijing	40.4% (2013)	3.64	1992	2005
Tianjin Economic-Technological Development Area	Tianjin	21.67% (2014)	2.77	1984	2006
Dalian Economic-Technological Development Area	Dalian	33.84% (2014)	0.53	1984	2008
Qingdao Economic-Technological Development Area	Qingdao	35.35% (2014)	1.90	1984	2001
Shenyang Economic-Technological Development Area	Shenyang	27.86% (2014)	0.33	1988	2007
Hangzhou Economic-Technological Development Area	Hangzhou	23.87% (2013)	0.54	1993	2004
Nansha Economic-Technological Development Area	Guangzhou	20.4% (2014)	1.45	1993	2005

land prices, leading real estate development to become the dominant driving force in Guangzhou's suburban development during this period. In 2004, with the adoption of the Nansha District Development Plan, Nansha became a major strategic node along Guangzhou's southward growth corridor, enabling Nansha to transition from an industrial development zone to a new growth node as an integral part of Guangzhou's economic development strategy, helping to alleviate some of the spatial development issues of Guangzhou city. As a consequence, Nansha's strategic position changed

dramatically.

- (3) From “smart expansion” to “optimization and improvement” (2005–2008)

Guangzhou's municipal governance structure was further realigned in 2005, with the Dongshan and Yuexiu Districts being merged into a new Yuexiu District, and the Liwan and Fangcun Districts being merged into a new Liwan District. Meanwhile, the original Guangzhou Development Zone and



**Table 5**  
Comparison of defining criteria of Chinese development zone-oriented edge urban areas and American edge cities.

Functional defining criteria of American edge cities		Selected criteria of Chinese development zone-oriented edge urban areas		
Content	Comparative items	Comparative items	Content	
suburbanization stage	development stage of central cities		Emerging ones	Mature ones
at intersections of main roads on the fringe of urban built areas or at intersections of suburban highways	spatial location		suburbanization stage	important nodes on regional transport corridor or portal areas for outward expansion
5 million square feet or more	leasable office space	tertiary industry increase value	proportions in GDP should be between 20% ~ 35%	proportions in GDP should be over 35%
600,000 square feet	leasable retail space	industrial structure	Coexisting manufacturing, producer services and high-tech industries	
more jobs than bedrooms	employment-to-population ratio		significant differences between jobs and residential population	a relatively balanced employment-to-population ratio
perceived by the population as one place	urban spatial morphology		sub-centers at the fringe of large cities	population ratio
nothing like a "city" as recently as 30 years ago	time for development into a "city"		transformative developments over 10 years or so	

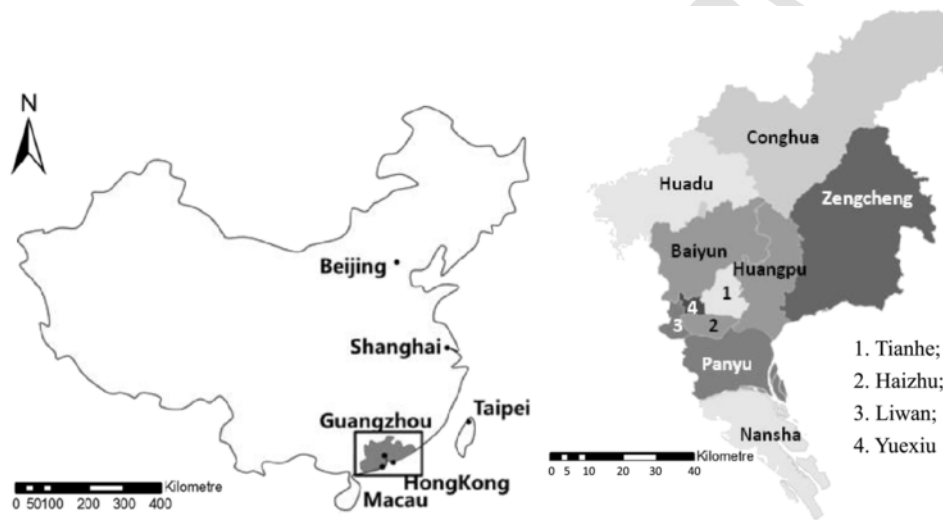


Fig. 2. Location of Nansha district in Guangzhou city, China

Nansha Development Zone were integrated into a new administrative district, turning Nansha into one of Guangzhou's official administrative districts. In 2007, following Guangzhou's 10th Party Congress, a new spatial development strategy was announced (Fig. 3) in which urban spatial development would be transform from outward "expansion" to inward "optimization and improvement". As a result, the focus of Guangzhou's urban planning and construction changed, prioritizing suburban infrastructure and major projects; and similar to the general suburban development process in China, Guangzhou's suburbanization entered a new phase in which urban spatial morphology and spatial distribution of urban functions were given greater emphasis.

(4) An increasingly clear polycentric spatial structure (2009-present)

Along with the ongoing transformative development from market segmentation to regional integration in the Pearl River Delta region, in 2010, Guangzhou's future spatial vision, "one metropolitan area, two new towns, three peripheral urban areas", was proposed in the "Guangzhou Strategic Planning and Master Planning Framework" document. At the 10th Party Congress of Guangzhou City at the end of 2011, a proposal for an urban spatial structure and urban functional layout was presented that aimed to create a polycentric urban structure. Later, in June 2012, the Chinese Academy of Social Sciences (CASS) proposed a "One Two Three" hierarchy of settlement development, with Guangzhou as the core, two new towns and three new sub-centers (Fig. 4). As one of the two new towns in Guangzhou city, the strategic position of Nansha was enhanced even

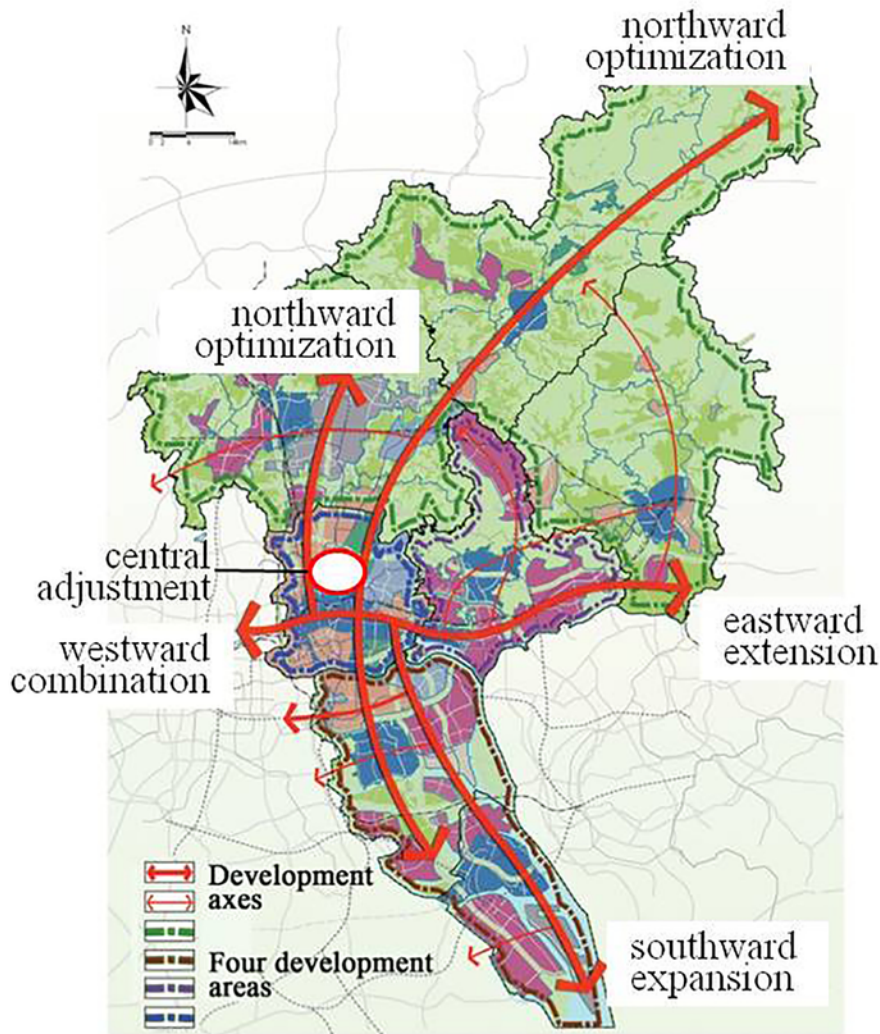


Fig. 3. Indication of Guangzhou “Cross Principles” development strategy.

further, and it has become a powerful engine in the transformative development of the Greater Guangzhou and Greater Pearl River Delta regions. Facing brand new opportunities and challenges in these times of globalization and regionalization, the building of a polycentric urban spatial structure was an inevitable choice for Guangzhou in its bid to become a “National Central City”.

1.2. Development path and the emerging edge urban area in Nansha

(1) Initial exploration stage relying on villages and towns (prior to 2000)

Fok Ying Tung, a Hong Kong Tycoon, first proposed the development of Nansha back in 1988, and played a major role in promoting Nansha's initial construction and development. Since then, the status of Nansha has improved step by step. In 1990, Nansha in Guangzhou, Daya Bay in Huizhou and Western Area in Zhuhai were established as three key development areas by the government of the Guangdong province; and in 1992, the State Council approved Nansha as a treaty port. In the following year, the State Council gave its approval for the establishment of Nansha as a Na-

tional Economic and Technological Development Zone. With Panyu city changing into Panyu district in 2000, Nansha, which boasts best deep-water port in southern China, also became part of Guangzhou city territory and the only coastal area in Guangzhou. At around that time, a “moderately heavy” industrial development strategy was proposed in Guangzhou, and Nansha began to take expanded industries from the central areas of Guangzhou.

Similar to one type of Western edge cities whose original development is based on villages and towns, Nansha's initial exploration also looked to the outer suburban villages of Guangzhou. Driven by conventional industrial relocations, policy support from local government and private investments, Nansha entered its initial stage of development.

(2) Rapid growth stage relying on industrial development (2001–2004)

In 2002, the Nansha Development Zone Construction Headquarters was established, and Nansha's leading construction and development body changed from the Administrative Committee of the Nansha Development Zone, under the responsibility of Panyu, into the Construction Headquarters

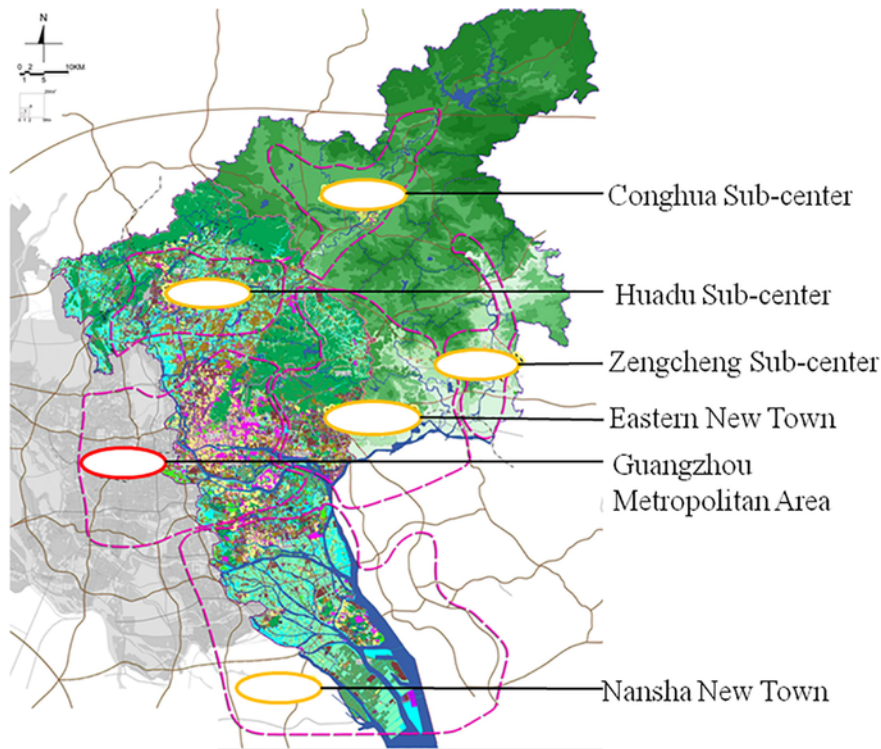


Fig. 4. Indication of Guangzhou “One, Two, Three” future spatial vision Sources: 2020 Overall Urban Development Strategic Plan of Guangzhou City

ters of the Nansha Development Zone overseen by Guangzhou municipality. Furthermore, the leading investment body also changed, from the social investments of the Fok Ying Tung Foundation, to governmental investments (Wen, 2010). As one interviewee noted, “the development at that time aimed at developing four main industries: steel, logistics, shipping and petrochemicals. Nansha’s positioning in the early “Big Nansha” period featured only industrial development” (interview, planner, Nansha, April 2015). The 2004 Nansha Area Development Plan established Nansha as a core area in Guangzhou’s southward spatial and industrial extension, and promoted the development idea of “big industry, big logistics and big transportation”. “The 2004 Nansha Area Development Plan was by this time already treating Nansha as an independent city. This plan provided effective guidance for nearly a decade” (interview, planner, Nansha, April 2015). From the changes in the proportions of different types of land use in Nansha in 1990, 2000 and 2006, we can see that with the accelerated urbanization process, the proportion of land allocated for building in-

creased dramatically, rising from 4.33% in 1990 to 15.08% in 2000, and then up to 35.70% in 2006 (Table 6).

Sources: Zhou et al., 2009.

**Different from edge cities in the West, whose initial development is residential-led, the driving force for continuous development in Nansha was largely industrial development promoted by local government and private investments. The rapid growth of Nansha at this stage was driven mainly by the manufacturing sector.**

(3) Accelerating and upgrading stage oriented by projects (2005–2009)

In 2005, the administrative divisions of Guangzhou city were readjusted and Nansha district was finally established, with a total area of 544.12 km<sup>2</sup> (Li, 2007). At that point, “the development focus of Nansha turned from purely economic development to comprehensive construction, including the economy, environment, urban qualities, public ser-

Table 6 Proportion changes of different types of land use in Nansha.

Land use types	1990	2000	2006	Change rate during 1990–2006 (= 100%)
Percentage				
Arable land	54.64	38.47	31.44	– 42.46
<b>Building land</b>	<b>4.33</b>	<b>15.08</b>	<b>35.70</b>	<b>724.48</b>
Woodland	8.08	10.01	3.59	– 55.57
Water	32.50	35.56	29.35	– 9.69
Unused land	0.48	0.83	3.00	525.00

vices, etc.” (interview, planner, Nansha, April 2015). At the end of 2008, the Pearl River Delta Region Reform and Development Plan (2008–2020) was approved by the State Council. Established as one of the five priority development areas in Guangdong-Hong Kong-Macao cooperation, Nansha New District led the transformation and development of the whole region, and became an important node in Guangzhou.

Its superior conditions in being established as a port spurred Nansha's heavy industry-oriented development in its early years. In line with this industrial development positioning, a large amount of investments were made into port construction, and the contribution of large-scale projects to Nansha's economic development exceeded a rate of over 50% (Nansha Government, 2012). A comparison of the above-scale industrial output value of the districts and counties in Guangzhou in 2009 reveals that Nansha's growth proportion ranked fourth with a percentage of 15.1%, indicating significant project-oriented industrial development.

**Nansha became one of Guangzhou's official districts at this stage. Driven by a number of large-scale projects, Nansha accelerated its upgrade and began to transform from a single industrial function to comprehensive development. High-tech industry became the main function and breakthrough sector in its industrial development. Similar to Western edge cities, promoted by industrial integration and globalization processes, Nansha started to show a comprehensive and integrated transitional trend.**

#### (4) Transformative stage with follow-up services (2010-present)

The April 2010 Framework and Agreement of the Guangdong-Hong Kong Cooperation defined Nansha as a pilot area for in-depth economic and social cooperation, bringing it even greater opportunities. In 2011, Nansha ushered in an important historical turning point. The development of Nansha New District was promoted officially to a national strategic level in the 12th Five-year Plan for National Economic and Social Development. Together with Qianhai in Shenzhen and Hengqin in Zhuhai, Nansha became one of three key areas for “further strengthening the Guangdong-Hong Kong-Macao cooperation”. In September 2012, the Nansha New District Development Plan (2012–2025) was approved by the State Council, and Nansha became the 6th new state-level district, filling the southern regions' gap in national districts. As stated in the plan, Nansha New District was become a comprehensive platform for the promotion of

**Table 7**  
The composition of GDP in Nansha, 2009–2012 (%).

	2012	2011	2010	2009
<i>Primary sector</i>	5.1	2.6	2.8	3.1
<i>Secondary sector</i>	73.0	80.6	80.6	79.6
Industry	69.7	76.2	76.5	73.8
Construction	3.3	4.4	4.1	5.8
<i>Tertiary sector</i>	22.1	16.8	16.6	17.3
Transport, logistics and postal services	3.4	2.7	2.9	5.0
Wholesale and retail	4.2	3.0	3.2	4.1
Hotel and catering	1.6	0.9	1.0	0.9
Real estate	4.2	2.8	2.0	2.5
Other services	8.6	7.4	7.5	4.9
Total	100.0	100.0	100.0	100.0

Guangdong-Hong Kong-Macao fully co-operations; a future important economic growth node in southern China; a regional ecological center; a regional transportation hub; and a regional service center. As an important carrier and platform representing Guangzhou city, the Guangdong province and even the entire nation in international competition and co-operation, Nansha will surely usher in a full range of improvements and promotions. If we take a closer look at the composition changes of GDP in Nansha from 2009 till 2012 (see Table 7), the increase of its tertiary sector mainly comes from real estate, wholesale and retail. Originally developed from a suburban town with natural port area, Nansha's transport, logistics and postal services also showed an increase in 2012..)

Sources: Nansha statistical year book, 2010–2013.

More recently, at the end of 2014, the State Council approved the establishment of the China (Guangdong) Pilot Free-Trade Zone, including Nansha as one of the three zones in Guangdong province. As noted by two of the interviewees, “a number of national strategies delivered from the central state to Guangzhou are actually fulfilled by Nansha, such as the New District, FTZ, etc.” (interviews, government officials, Nansha, April 2015). Another interviewee highlighted the dynamics of Nansha's transformation: “The bodies spurring Nansha's transformation are diverse. National policies play a part, but the most important part is the strong intentions of local governments to promote the development of Nansha” (interview, planner, Nansha, March 2015).

**With the promotion and support of both central governmental policies and local governmental constructions, along with the gradual relocation of service industries and the concerted efforts towards Nansha's development, Nansha is beginning to share similar characteristics to Western edge cities. In particular, with the newly approved Nansha New District Development Plan (2012–2025), Nansha has already started its strategic transformation into a fully functional Chinese edge urban area. (see Table 8)**

Sources: Official website of Nansha New District.

#### 4.1. An emerging edge urban area of Guangzhou

A comparison of Nansha and other Chinese edge urban areas reveals five main similarities, including spatial location, increase in value of tertiary industry, industrial structure, employment-to-population ratio and urban spatial morphology. Huge investments and long-term efforts to

**Table 8**  
Development process of Nansha, Guangzhou city: From a development zone to a fully functional “city”.

Stages	Year	Macro background	Functional transformation	Significant events	Dominant dynamics
Initial exploration	1993–2000	Establish Nansha as a National Economic and Technological Development Zone; Deng Xiaoping’s southern tour	Industrial function	In 1997, Guangzhou municipal government gave formal approval to the Master Plan of Nansha Economic and Technological Development Zone. In 2000, the new round of Guangzhou City Overall Strategic Plan was established, with spatial development strategy of “southward expansion, northward optimization, eastward extension, westward combination”. In 2000, Panyu and Huadu cities changed into Panyu and Huadu districts, and Guangzhou became a coastal city.	local governmental policies, private investments and industrial relocation
Rapid growth	2001–2004	Gain WTO membership; Scientific concept of development	Industrial-based, residential functions supplemented	In 2002, Nansha Development Zone Construction Headquarters was formally established. The development of Nansha started. In April 2002, Guangdong provincial government held a conference on promoting Nansha’s development. In 2004, Nansha Development Plan was released.	local governmental constructions and private investments

Table 8 (Continued)

Stages	Year	Macro background	Functional transformation	Significant events	Dominant dynamics
Accelerating and upgrading	2005–2009	Harmonious society; Low-carbon economy	Gradually become fully functional	In 2005, Guangzhou implemented administrative division adjustments, and Nansha transformed into an independent administrative area. In September 2009, Zhu Xiaodan, the Party Secretary of Guangzhou, emphasized “ecological priorities” for Nansha, and reintroduced the concept of Nansha Coastal Eco-town.	large-scale project-led and globalization process
Transformative development	2010–2013	Guangdong- Hong Kong-Macao cooperation; Guangzhou “123” spatial development strategy	Face the whole region, and is transforming to comprehensive, integrated functions	In 2010, Framework and Agreement of Guangdong-Hong Kong Cooperation was signed. In 2011, the development of Nansha District was included in the 12th Five-year Plan for National Economic and Social Development. In October 2011, Guangdong provincial government held a conference on the development and construction of Nansha New District. In May 2012, the 11th Party Congress of Guangdong province stated Nansha’s development and construction as the priority item in the transformation and upgrading process of Guangdong province. In September 2012, the State Council officially approved Nansha New District Development Plan (2012–2025).	central governmental policies and local governmental constructions

wards construction and development have granted Nansha with some of the most basic features of an independent “city”. Regarding the time taken for development into a

“city”, it has taken only 20 years for Nansha to develop from a National Economic and Technological Development Zone to an emerging edge urban area of Guangzhou. Its

prime spatial location central to Guangdong, Hong Kong and Macao, as well as the powerful support it has received from national and local governmental policies have been key factors in its rapid development. (see Table 9)

*Sources:* 2012 National Economic and Social Development Statistics Bulletins of Nansha, Guangzhou city; Investment Environment Analysis Report of Nansha Development Zone, Guangzhou city.

In summary, Nansha can at present be regarded only as an emerging edge urban area of Guangzhou. Its transformation from an industrial zone into a coastal “city” with comprehensive urban functions has begun, and has already seen some success. Continuous improvement to its industrial base and urban functions will help promote its future development and the edge urban formation of Guangzhou.

## 5. Conclusion

Chinese edge urban areas have emerged as an inevitable outcome of the transformation of Chinese development zones and the strategic choice of large city regions as they strive to develop a more polycentric development pattern. This paper provides both general (in terms of characteristics) and in-depth and dynamic (in terms of processes) discussions on one particular type of Chinese edge urban area. To characterize Chinese edge urban areas, we adopted the defining framework for archetypal edge cities developed by Garreau, which we adjusted for the Chinese context. This context-specific framework was also used in a case study to test Nansha as either an emerging or mature edge urban area. The findings suggest that Chinese edge urban areas are transforming out of mono-functional development zones, which share certain similarities with American edge cities.

First, the **development stage of central cities:** in both cases, edge cities/urban areas emerge at the suburbanization stage of central cities. Second, the **spatial locations of Chinese edge urban areas** are at important nodes on the regional transport network or in port areas, allowing outward expansion. Third, they have an **industrial structure** that includes coexisting manufacturing industries, producer services and high-tech industries. Fourth, **urban spatial morphology:** they are perceived as one place by people, and in the Chinese case, edge urban areas become secondary centers in the suburban areas of large cities. Fifth, **the period of time to develop into a “city”:** their construction and development have occurred over 30 years or so, and the landscape has changed significantly.

That said, when taking into account the special development background of large Chinese cities, development zone-oriented Chinese edge urban areas present some unique characteristics. Comparing the relevant tertiary industry increase-value indicators of Chinese edge urban areas with normally established cities, and the degree of employment-to-population balance, Chinese edge urban areas can be divided into two categories: emerging and mature. The unique qualities of emerging Chinese edge urban areas include mainly a. Tertiary industry increase value: proportions of GDP should be between 20 and 35%; b. Degree of employment-to-population balance: significant differences between jobs and residential population. (Table 5).

Furthermore, the development paths of Chinese edge urban areas are also different to those in the United States. In the US context, after cities underwent a suburbanization of

jobs as a result of a large number of corporate headquarters and office parks relocating to the suburbs, urban functions of suburban areas were increasingly strengthened and improved. Edge cities, in this context, driven by the market and developers, formed gradually at the intersections of main roads on the fringe of urban built areas or at the intersections of suburban highways. In contrast, within the Chinese context, the basic path of transformative process from development zones to edge urban areas can be broken down into three different phases. 1) Initially, unlike market-oriented large-scale suburbanization in the United States, suburban villages/towns in China developed into single functional areas alongside industrial relocations. This early development stage of suburban villages/towns was driven primarily by the central city government. 2) In the 1990s the market came to intervene and became increasingly active. Entering into the 21st century, influenced by the external environment and internal demands, development zones with single industrial function faced re-development, and gradually entered the strategic transformative stage. Meanwhile, collaborations and spatial integrations within large city regions were strengthened and the producer services in large cities were reconstructed, which led Chinese suburban development into a brand new stage. 3) Accordingly, driven by the market and governments (unlike in the United States, where developers took the lead role) development zones in some large cities began to transform gradually into fully functional new edge urban areas. In this regard, we also argue that edge cities are context specific, and whilst their characteristics may bear some similarities, the processes of their growth and transformations are very different with respect to their specific dynamics and the dominant driving bodies at different stages of development.

Based on the above findings, some issues are raised to allow a deeper understanding of Chinese edge urban areas, so as to better promote their future developments. Firstly, rather than simply adopting Garreau's ideas on defining US edge cities, critical translations and analyses of this “imported” concept are essential for Chinese edge urban areas, given the different path of their development compared to their US counterparts. Secondly, the interests of different steering bodies or stakeholders and the interactions among them should be explored in more depth in order to better understand the dynamics during the development of Chinese edge urban areas. Thirdly, it should be noted that not all development zones will necessarily end up in the form of Chinese edge urban areas. The example of Nansha presented here is currently in the process of becoming an “city” of Guangzhou. With the new opportunities ushered in with the “One Belt, One Road” national strategies and policies, and the establishment of the Guangdong Free Trade Zone (to which Nansha contributes as one of the three major ports), Nansha will undoubtedly continue developing to a higher level, and may even become a regional central city of the Great Pearl River Delta region. Finally, given the rapid (post)suburban construction taking place in China and in the emerging Chinese edge urban areas in the suburbs of some large cities, Chinese edge urban areas are certainly worthy of more attention and further in-depth study. Future researches into Chinese edge urban areas can contribute significantly to the body of literature on edge urban formations in general, and can also provide unique and novel cases for comparative analysis.

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**Table 9**

Comparative study of the main characteristics between Nansha and development zone-oriented edge urban areas in China.

Main characteristics of emerging Chinese edge urban areas	Main characteristics of Nansha, Guangzhou city		
Content suburbanization stage important nodes on regional transport corridor or portal areas for outward expansion proportion of tertiary industry increase value in GDP should be between 20 and 35% manufacturing, producer services and high-tech industries coexist	Comparative items development stage of central cities spatial location	Comparative items development stage of central cities spatial location	Content suburbanization stage located in the southeast of Guangzhou; at the intersections of the Guangzhou, Shenzhen and Zhuhai highways proportion in GDP: 22.18% (2012)
significant differences between jobs and residential population sub-centers in the suburbs of large cities construction and development occurring over 30 years or so	tertiary industry increase value industrial structure employment-to-population ratio urban spatial morphology time period for development into a "city"	tertiary industry increase value industrial structure employment-to-population ratio urban spatial morphology time period for development into a "city"	five major industrial clusters, including high-end services, technology intelligence industry, port advanced manufacturing, marine industry, tourism, leisure and healthy industry, etc. ratio of jobs to population: 0.46  a sub-center in the suburbs of Guangzhou construction and development has occurred over 20 years or so





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