# **Key words:** polycentricity; edge cities; edge urban areas; mega city regions; Guangzhou

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<ATL>POLYCENTRIC DEVELOPMENT AND THE FORMATION OF EDGE URBAN AREAS IN CHINA’S MEGA CITY REGIONS: Case Study of Nansha, Guangzhou</ATL>

**<AU>HUI CHENG AND DAVID SHAW</AU>**

**<H1>Abstract<H1>**

# **<ABSTRACT>**Towards the end of the 20th century, polycentricity was introduced into China as a new planning concept. Subsequently, a number of mega city regions applied polycentric spatial planning strategies, designed to facilitate more sustainable and balanced development, by promoting expanded settlements or subcentres at the edge of the central cities. These urban clusters have often been termed edge cities in the West. Although edge urban areas in China bear some resemblance to Western edge cities, we argue that these growing centres need to be understood through the lens of a polycentric development framework specific to China. This article investigates the formation of edge urban areas as part of polycentric development practices, with particular reference to the specificities of the Chinese context. Guangzhou, a mega city region, is selected as the polycentric context within which the embedded edge urban area Nansha is located. After exploring Nansha’s spatial features, functional identities and governance arrangements, we suggest that the area has experienced a typical development trajectory associated with different dynamics at each stage of its growth. Nansha’s formation as an edge urban area is in line with the delivery of a polycentric spatial structure for the Guangzhou mega city region. **</ABSTRACT>**

#  <H1>**Introduction</H1>**

Within Western literature, polycentricity remains a fuzzy concept, open to multiple interpretations (Kloosterman and Musterd, 2001; Davoudi, 2003; Shaw and Sykes, 2004; Meijers, 2008; Lambregts, 2009) in terms of its morphology and function, as well as being applied to diverse geographical contexts and by embraced by different professional communities (Eskelinen and Fritsch, 2009). Since the early 1990s, polycentricity has been invoked as a policy ideal, with one of its main objectives being the desire, perhaps normatively, to promote more balanced development within cities, city regions, functional urban areas and, more broadly, within regions at a national or supranational scale (Hall and Pain, 2006). More recently, the concept has also met with widening academic acceptance in China, where studies have focused on (1) describing the characteristics of polycentric patterns through the lenses of commuting behaviour (Lin *et al*., 2015), land-use change (Wu, 1998; Yue *et al*., 2010), population or employment distributions (Liu and Wang, 2016; Huang *et al*., 2017; Sun and lv, 2020), house prices (Qin and Han, 2013; Wen and Tao, 2015) or the flows of data and information (Liu *et al*., 2016; Li and Phelps, 2016; Mu and Yeh, 2016; Zhao *et al*., 2017); (2) evaluating the economic, or environmental performance of polycentric spatial structures (Yan and Sun, 2015; Zhang *et al*., 2017; Li *et al*., 2019; Wang *et al*., 2019); and (3) exploring the multi-level governance arrangements of polycentric cities or regions (Yang, 2008; Zhang *et al*., 2008). However, limited research has been published on the application of polycentricity to China’s urban planning practices (Wang *et al*., 2020). By around 2000, a number of China’s mega city regions had begun to apply polycentricity as a core objective for spatial planning and had articulated these perspectives in various strategic plans (Cheng and Shaw, 2017), including the promotion of edge urban areas (for example, subcentres, new areas, new towns) as the main approach to delivering polycentric spatial development strategies.<FN1> How these edge urban areas have been formed to help promote polycentric city regions has not really been investigated. Therefore, this article aims to explore how and why an edge urban area has been formed under a polycentric development strategy at the city regional scale.

 The idea of edge cities originally emerged in the US but has been widely discussed as a phenomenon in different regions around the world, notably Europe, East Asia and Australasia. Edge cities were traditionally developed in suburbs surrounding an original urban core (Garreau, 1991). The industrial structure of these places often exhibits a high level of specialization, and they have replaced some of the functions of the central city (Bingham and Kimble, 1995; Dietsch, 2001). Overall, connections between edge cities and their urban cores, and between different edge cities, start to emerge both spatially and functionally, creating the semblance that edge cities are emerging as subcentres within a polycentric spatial structure with (functionally) interdependent centres and (spatially) horizontal linkages. Although the role of edge cities, as subcentres forming part of a polycentric structure has been recognized (Krugman, 1996; Bontje and Burdack, 2005; Liu and Wang, 2016), few insights have emerged as to how edge urban areas, especially in China have been planned as part of a polycentric spatial structure, in contrast to the West, where edge cities often appeared organically.<FN2>

 The dynamics of the new town growth in the Beijing city region has been characterized, by Wu and Phelps as follows, ‘In the Chinese global city-region, post-suburban development is orchestrated by the entrepreneurial arms of the state which aim to invent growth poles as a means of further promoting the international economic role of a polycentric Beijing metropolitan economy’ (2011: 427). Following on from their study, this article seeks to explore how this orchestration by the entrepreneurial arms of the state is in practice operationalized in the planning of an edge urban area as part of a polycentric development framework. Guangzhou is the wider city region within which Nansha is examined as an embedded case study. Nansha has experienced several cycles of development and can now be characterized as an edge urban area within Guangzhou city region. National, provincial and municipal planning policies have all played an important role in its development.

 The remainder of this article is structured as follows. First, it reviews the formation of edge cities mainly in the US, Europe and East Asia developmental contexts, and their roles in delivering polycentric development. Then, an analytical framework consisting of three interconnected themes (spatial features, functional identities and governance arrangements) is proposed as a lens for exploring edge urban areas in China. These were generated from the *edge city* and *polycentricity* concepts, especially when considering them in a Chinese context. These themes are used to understand the making of an edge urban area, namely Nansha, within Guangzhou’s polycentric development. Finally, we present some concluding remarks are presented.

#  <H1>**The formation of edge cities and their roles in delivering polycentric development**</H1>

* 1.

Edge cities were widely considered to have been a new characteristic of suburban development in the late twentieth century in North America (Bontje and Burdack, 2005). The development of urban areas was no longer solely reliant on an independent growth pole (the city centre); instead, new urban development began to be characterized by the formation of new centres in suburban areas (Garreau, 1991). Metropolitan areas were gradually reorganized, taking on a more decentralized form to create a new geographic landscape. Outer suburban centres that bear some (or little) resemblance to American edge cities have also been identified in Europe (Bontje, 2004; Bontje and Burdack, 2005), Australia (Freestone, 1997), Korea (Lee and Shin, 2012), Tokyo (Phelps and Ohashi, 2018) and China (Wu and Phelps, 2011; Gao *et al*., 2014; Cheng *et al*., 2017).

 In the US and Europe, the role of edge cities in contributing to polycentric development has three aspects. First, edge cities have been noted as nodal points within polycentric city regions. Garreau (1991) observes that the growth of edge cities in the suburban, and even the outmost reaches of large metropolitan areas, can be seen as a recent phase in the evolution of urban spatial structures. Edge cities are ‘characterized by large concentrations of office and retail space, often in conjunction with residential and other types of development, at the nodes of major transport networks’ (Davoudi, 2003: 982). Thus, within a polycentric region, there usually is no single dense core but a series of dense areas or subcentres distributed across the region creating a matrix of lower-density development (Garreau, 1991). It has been argued that the spatial characteristics of metropolitan areas in the US are polycentric, because they consist of many employment centres (Anderson, 2004). These subcentres or edge cities create clusters or nodal points within a polycentric metropolitan or city regional form (Garreau, 1991; van Meeteren *et al*., 2016).

 Second, based on agglomeration economies, edge cities play a complementary role in supporting polycentric development. Anas, Arnott and Small (1998: 1426) argue that the process of decentralization in urban regions ‘has taken a more polycentric form, with a number of concentrated employment centres making their mark on both employment and population distributions. Most of these centres are subsidiary to an older central business district (CBD), hence are called “subcentres”’. These newly spawned ‘subcentres’ at nodes of transportation networks, are often so far from the urban core as to earn the appellation ‘edge cities’ (Anas *et al*., 1998). Therefore, edge cities are one type of subcentre contributing to a more polycentric urban structure and are interdependent from **{‘interdependent with’ or ‘independent from’?}** older CBDs or the core cities. Furthermore, Bogart (1998) explains how the development of edge cities (or employment centres) as complementary to industrial-era city centres, can be thought of as a consequence of decreasing transportation costs resulting in decentralization of services. In Western Europe, Bontje and Burdack (2005: 328)argued, ‘the European suburban economic poles are not meant to be alternatives to the traditional town centres but rather should thought of as complementary structures to support polycentric development’.

Third, edge cities have become promoters of polycentric city regions with more balanced development. This transition in metropolitan structure from a monocentric form to a more polycentric one enables a more balanced distribution of employment across metropolitan areas. As Arribas-Bel and Sanz-Gracia (2014: 982) state, ‘this “suburban downtown” phenomenon can be defined as the process by which employment leaves the CBD and recentralizes in an orderly, and compact fashion, in new poles or nodes that constitute a polycentric structure’. Some researchers have also observed that the emergence of edge cities indicate a shift in the balance of economic forces within polycentric urban regions (Phelps and Ozawa, 2003; Phelps, 2004). In Europe, Bontje (2004) observes, there are numerous examples of metropolitan regions where the deconcentration of employment has led to new subcentres emerging with densities sometimes comparable to those of the core city. Prompted by these newly formed subcentres, new polycentric structures have been formed, and these European metropolitan regions are moving towards more sustainable and balanced development with a series of new job concentrations close to suburban and rural living environments.

 Within both US and European developmental contexts, edge cities are often characterized as being subcentres organically formed during a process of suburbanization, with various urban functions coalescing at the nodes of major transportation networks. They have become nodal points within polycentric city regions promoting balanced development. By contrast, the planning of edge urban areas in China has been actively pursued as part of an integrated approach to promoting polycentric spatial structures. Here the state, through its ownership of the land, can directly influence the making of those new centres. To explore this new mode of polycentric practice, we have constructed an analytical framework for exploring Chinese edge urban areas that is elaborated in the next section.

# **<H1>Analytical framework for exploring edge urban areas under the polycentric development practices in China****</H1>**

* 1.

From an analytical perspective this article explores three key themes of the polycentricity concept from the perspectives of spatial development and spatial planning practices. First, from a policy perspective polycentricity is often associated with two theoretically distinct aspirations: spatial integration and functional balance (Lambregts, 2009; Burger, 2011; Burger *et al*., 2011; Burger and Meijers, 2012; Vasanen, 2013), which ‘when combined have become the new objective of functional polycentric development, which, if applied at a regional scale, can deliver an integrated polycentric region’ (Cheng and Shaw, 2017: 165). The defining feature of polycentricity therefore, can be regarded as the breakdown of the classical monocentric urban hierarchy, which is replaced with a series of interdependent centres with strong and strengthening horizontal functional connections at a variety of spatial scales (Qian and Wong, 2012). Hence, from a planning or policy perspective, polycentricity should ‘embody two major principles: a settlement system and a spatial structure. In other words, urban form should be considered as a networked system consisting of urban centres and rural towns, or functional interdependent centres/towns, all of which are horizontally and functionally interconnected’ (Cheng and Shaw, 2017: 165).

 Second, in terms of the spatial scale for polycentricity, the concept has been applied at both the intra-city (Wu, 1998; Zhao *et al*., 2011; Wen and Tao, 2015) and inter-city scales (Yang *et* *al*., 2015; Liu *et al*., 2016; Wang *et al*., 2016) in China. This article explores the polycentricity application at an intra-city scale (city-regional scale) in China’s mega city regions. Finally, apart from the nature and scales of polycentricity application, exploring informal and multilevel governance arrangements has helped an understanding of the dynamics of polycentric regions in a European setting (Spaans and Zonneveld, 2016). In China, a number of studies have also noted the importance in changes of governance in the process of spatial agglomeration and reconstruction (Zhang, 2006; Phelps and Wu, 2008; Wu and Phelps, 2011; Li and Wu, 2012). However, this research on multi-level governance in China has only focused on the inter-city scale (Yang, 2008; Zhang *et al*., 2008). The third theme to emerge in evaluating edge urban areas as a component of polycentric development in China has to do with the governance of city regions, including the changes in governance bodies and governance structures over time. In summary, these three key themes have emerged as lenses for investigating the application of polycentricity in China: conceptualizing polycentricity in practice, multiple scales of application and multi-level governance under a polycentric framework.

 Existing literature has already highlighted some of the limits in applying the term *edge city* outside the US (Phelps, 1998; Phelps and Parsons, 2003; Bontje and Burdack, 2005; Phelps *et al*., 2006; Phelps and Wu, 2008). Garreau (1991) only provides a few general guidelines and characteristics for an edge city, and none of these can be applied and measured systematically across a metropolitan region (Forstall and Greene, 1997). Considering their unique context and historic growth, edge cities elsewhere can only be noted as a variation of the original American edge city model, and how to define and identify edge cities in different geographical contexts should always be considered first. Moreover, because of the development background and spatial scales of city regions being vastly different in China compared with the US, Garreau’s (1991) five defining criteria are not applicable to edge cities in China.

 Therefore, in view of the context-specific features of an *edge city*, this article avoids using that precise term term to refer to China. Rather, in this research, *edge urban areas* is used to describe the polycentric nodes emerging at a city regional scale within China’s mega city regions. Similar to edge cities in the US or Europe, an edge urban area in China is also considered as a form of urban settlement or subcentre within a polycentric spatial structure at the city-regional scale. Moreover, instead of adopting definitive criteria from the US, this article explores edge urban areas based on the two words ‘edge’ and ‘city’, but also through the lens of polycentricity. More specifically, an edge urban area in China should be located beyond the central city, at the edge or periphery of a region, with a defined boundary. As to the other element ‘city’, in the US an edge city contains all the basic functions of a city and could in its own right be a fully functional centre (Garreau, 1991). Here it is argued that every city should have its own major function(s) and therefore, an edge urban area in China should have its own specialized function(s). However, it does not necessarily have to have all of the functions of a city; instead, it should be functionally interdependent with its core city. In addition, from the point of view of polycentricity, edge urban areas in China also help to construct polycentric structures at a city-regional scale. Moreover, as ‘cities’, edge urban areas are considered a mature type of urban settlement or subcentre, the horizontal linkages that exist between the core city and edge urban areas, and also between different edge urban areas, together form a networked spatial structure.

 The themes for exploring edge urban areas in China have been generated on the basis of the key themes of the polycentricity concept in spatial development and spatial planning practices in the country and the definition and understandings of Chinese edge urban areas, (see Table 1), these include spatial features, functional identities and governance arrangements.

 <INSERT TABLE 1 NEAR HERE>

# <H1>**Research methods</H1>**

Methodologically, this research adopts a case study approach. As Yin (2014: 2) suggests, compared with other research methods a case study approach offers distinct advantages when ‘(1) the main research questions are ‘how’ or ‘why’ questions; (2) a researcher has little or no control over behavioural events; and (3) the focus of study is a contemporary phenomenon’.

 The data used in the following empirical analysis were mainly drawn from key documents and interviews with key stakeholders at both the city-regional (Guangzhou) and local (Nansha) scales. Our documentary analysis regarding the spatial, functional and governance arrangements of Nansha included a review of (1) master plans and strategic plans, (2) economic and social development documentation and statistics, (3) government reports and policies, (4) local yearbooks and profiles from the local chronicles office, and (5) media reports. To corroborate the findings from this documentary review a total of 25 semi-structured interviews were conducted, with people from different organizations who were responsible for, or had been involved in, the planning/implementation/regulation associated with the formation and growth of Nansha. These included governmental officials from both city-regional and local agencies; public planners and consultants who had participated in the city regional and local planning schemes; academics from Guangzhou with expertise in urban planning and economic development; and state-owned enterprises, large-scale private enterprises, major development companies who had witnessed the growth of Nansha. The key gatekeepers were academic experts in Guangzhou and governmental officials in Nansha, who helped to develop links with other participants through a ‘snowballing’ process. Recognizing the limitations of any one source the following account is based on a triangulation of multiple sources to provide a narrative account of how Nansha has developed as an edge urban area within Guangzhou’s emerging polycentric structure.

#  <H1>**The making of an edge urban area: the case of Nansha**</H1>

Guangzhou mega city region was chosen as the empirical context for this study because the most recent application of its spatial development strategy seeks to proactively create a functional polycentric structure characterized by balanced development. The functional interdependencies of the subcentres and the horizontal linkages between the core city and the subcentres have been highlighted as policy priorities. The reason for choosing Nansha is that it has been recognized, and consciously developed, as part of the polycentric spatial structure for the Guangzhou city region in at least the last two rounds of Guangzhou’s spatial planning activities, although its strategic role has changed. In 2000, Nansha was identified as the core area for Guangzhou’s southward spatial and industrial extension, its major role being to accommodate the expanding and relocating industries from the central city. In 2010 Nansha was designated as one of the six subcentres within Guangzhou city region, and its development focus changed to becoming more comprehensive and benefiting from a holistic set of city functions. A more recent draft version of the *Guangzhou Master Plan (2017–2035)* has once again raised the regional importance of Nansha, identifying it as the key subcentre within the city region and the principal gateway for the Guangdong–Hong Kong–Macao Greater Bay Area (GBA) (People’s Government of Guangdong Province, 2018).

## <H2>Spatial features</H2>

 With regards to Nansha’s spatial characteristics, two prominent aspects need to be discussed, its spatial location and its spatial interconnections with Guangzhou’s core city.<FN3> Nansha district is located at the southern end of Guangzhou city region. In a broader context, it lies at the geographic centre of the Pearl River Delta (PRD), 38 sea miles from Hong Kong, 41 sea miles from Macao, and within 100 km of 11 city regions located in the PRD (see Figure 1). These 11 city regions constitute the newly established GBA. This primary gateway location of Nansha was initially ignored by Guangzhou when it followed a more monocentric development trajectory. After Panyu county was absorbed into the administrative districts of the Guangzhou city region in 2000 (at which time Nansha was simply a small town within Panyu county), Guangzhou city region became a coastal city region with direct access to the South China Sea. Following this administrative reorganization, Guangzhou’s city-regional master planning began to acknowledge and promote a polycentric spatial development structure (GMPB, 2005; 2012). Nansha became identified as a key subcentre within Guangzhou city region, partly attributable to its locational advantages both within the city region, but also possible horizontal connections with surrounding cities within the PRD.

<INSERT FIGURE 1 NEAR HERE>

 Nansha is a typical and interesting case, in that different spatial entities within the area have been established, resulting in different connections with Guangzhou. This reflects the development history of Nansha. Before 1988 Nansha was a typical outer suburban residential town under the jurisdiction of Panyu county. Since then the town has experienced several reorganizational cycles and the name ‘Nansha’ has related to significantly different geographical, functional and governance arrangements (see Table 2). They include ‘Small Nansha’ (Lin, 2013: 473), a planned coastal new city along the eastern bay; ‘Nansha National Economic-Technological Development Zone (NETDZ)’; ‘Nansha district’, a designated administrative district within Guangzhou city region; ‘Nansha State-level New Area’, a national-level area with comprehensive functions charged with undertaking major national strategic tasks; and ‘China (Guangdong) Pilot Free Trade Zone (FTZ) Nansha Area of Guangzhou’, a significant part of China’s (Guangdong) Pilot FTZ.

 Before 1988 Nansha was a small rural coastal town. Its initial development, from about 1988, was promoted by a private individual investor and only covered an area of 22 km2. It was a long narrow strip of development land along the eastern bay. This is the so-called ‘Small Nansha’, and was expected to be, and planned as, a playground for Hong Kong (*ibid.*: 479). It was designed mainly with service functions in mind for living, recreation and holidays. During these initial stages of Nansha’s development, its main support and resources were provided by a pre-eminent Chinese businessman based in Hong Kong, Fok Ying Tung, who hoped to use his wealth and influence to strengthen cultural ties between Hong Kong and mainland China. It is important to acknowledge that his original hometown was Panyu (which included Nansha at that time).

 The second phase of development saw the Nansha NETDZ being officially approved by the State Council in 1993. Just over ten years later, in March 2004, the spatial area of Nansha NETDZ was extended from an initial 9.9 km2 to 27.6 km2. This provided Nansha with much more space, which was needed for further development. During this time Nansha also experienced several changes in its administrative organizations (see Figure 2). Until 2005 it was a small town situated within Panyu district. In 2005 it became an administrative district of Guangzhou city region, directly governed by the Guangzhou Municipal Government. In 2012 Nansha district absorbed another three towns (Dongchong, Lanhe and Dagang) from Panyu district, and its total area grew to 803 km2. Today Nansha district comprises six towns and three streets.<FN4>

<INSERT FIGURE 2 NEAR HERE>

Then, in September 2012, the State Council officially approved the *Nansha State-level New Area Development Plan (2012–2025)* (National Development and Reform Commission, 2012), which covered the same area as Nansha district. Nansha thus became the sixth State-level New Area across China, and the only one in the PRD. This meant it was designated as a national strategic area, with a significant status not only within Guangzhou city region, but within the wider PRD. By the end of 2014 the State Council had approved the establishment of China (Guangdong) Pilot FTZs. As one of three such zones, a 60 km2 pilot free trade zone was established in Nansha district, which was intended to be focused on services such as shipping, logistics, international business, finance and high-end manufacturing. More recently, Nansha has also been designated as an important strategic cooperation node for the ‘One Belt One Road’ Initiative designed to reconnect China to many existing, and new, global markets following the ideas of the original ‘Silk Road’. Thus two nationally strategic platforms have been established in Nansha FTZ with the purpose of facilitating international investments, promoting technical collaborations and providing innovation and entrepreneurship services (*Southern Daily*, 2017).

 To summarize, ‘Small Nansha’ was principally initiated and promoted by a private investor. It provided the earliest development vision for Nansha, but had relatively weak links with Guangzhou’s core city. The second phase of Nansha’s development saw the establishment of the NETDZ and was promoted by Guangzhou Municipal Government, primarily as a means of developing a large decentralized employment node, moving industries away from Guangzhou’s core city. The Nansha State-level New Area and Nansha FTZ were national designations intended to fulfil national development strategies, which would also help to improve the regional status of the Guangzhou city region. Table 2 summarizes the changes in administrative arrangements associated with the different identities for Nansha. These changing strategic roles and development spaces, endowed Nansha with different identities and functions, and envisaged that it would develop co-operations, not only with its neighbouring cities, but also with many potential partners in a globalizing world. As one interviewee noted, ‘a number of national strategies and important roles given by the state to Guangzhou, are actually delivered, or fulfilled, by Nansha’ (interview, governmental official, Nansha).

<INSERT TABLE 2 NEAR HERE>

##  <H1>Functional identities</H1>

To examine to what extent Nansha has become an edge urban area within Guangzhou’s polycentric structure, the functional identities of Nansha will now be discussed, focusing on its major functions and functional connections with Guangzhou’s core city.

 Nansha’s economic structure has a long-established emphasis on the secondary sector. From Table 3 it can be seen that, although the secondary sector remains dominant in Nansha, its relative share of Nansha’s GDP has declined significantly from 80% in 2009 to 60% in 2017. In part this is due to governance reorganization, with Nansha absorbing another three towns from Panyu district in 2012, which led to a drop in the secondary sector’s share in the economy of almost 8%. Nevertheless, such dramatic change is indicative that a transformation in Nansha’s economic structure has been taking place. Indeed, Nansha’s tertiary sector has experienced a sharp increase (see Table 3), more than doubling from 16.8% in 2011 to 35.5% in 2017. Within the tertiary sector, the development of wholesale and retail, and real estate has been most dramatic with each segment increasing by 190% and 182.14% respectively. Figure 3 illustrates the speed of the real estate development projects in Nansha.

<INSERT TABLE 3 NEAR HERE>

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 It is clear that Nansha’s major economic function is still focused on an industrially oriented economic secondary sector. This is because Nansha’s initial industrial development focus was to act as a replacement location for the displaced and expanding needs of heavy industries originally located in Guangzhou’s core city and thereby satisfy Guangzhou’s ‘moderately heavy’ (China Economic Net, 2011) industrial development strategies. The subsequent ‘big industry, big logistics and big transportation’ idea contained in the *2004 Nansha Area Development Plan* (GMPB, 2004) guided the next 10 years of Nansha’s economic development. More recently, because of the newly established State-level New Area and a significant part of Guangdong Pilot FTZ, Nansha’s economic focus has shifted from the secondary to the tertiary sector, and an increase in Nansha’s tertiary sector is also evident from Table 3. A particular focus has been placed on the logistics, high and new technology, and modern industrial service sectors. These are all highlighted and promoted in the *2001 and 2011 Guangzhou Master Plans* (GMPB, 2005; 2012), *2004 Nansha Area Development Plan* (GMPB, 2004)and *The Comprehensive Planning of Nansha New City (2012–2025)* (GMPBNPB, 2012). An interviewee explained, ‘the industrial positioning of Nansha has changed fundamentally. From the large-scale heavy industry relocations at the very beginning, to a more recent emphasis on advanced manufacturing, producer services, and so on. Significant adjustments in the developmental priorities have occurred. As a result, local plans have to be adjusted to accommodate these changes’ (interview with planner, Nansha).

 Turning to Nansha’s functional connections with the core city, Table 4 shows a comparison of cargo throughput between Nansha port and Guangzhou port as a whole between 2010 and 2018.<FN5> The percentage of Nansha’s cargo throughput as a proportion of Guangzhou’s total cargo throughput saw a significant increase from 34.79% (2010) to 58.72% (2018). This indicates that Nansha, as a port, has not only increased its dominance compared to other port areas in the Guangzhou city region, but has also established strong functional linkages with the Guangzhou urban core because of port logistics. Moreover, in 2015 this functional connection was further enhanced by the Guangzhou Shipping Trading Limited Company relocating to Nansha, a move that was actively supported by Nansha District (People's Government of Nansha District, Guangzhou City, 2015).

<INSERT TABLE 4 NEAR HERE>

 **with**

 At an early stage, like many other industrial development zones in China, Nansha followed a project-oriented development model. As one of Guangzhou’s outer suburbs, Nansha was only considered as a place for industrial relocation under Guangzhou’s monocentric development strategy. With Guangzhou’s promotion of a polycentric development strategy, Nansha began its transformation, becoming a comprehensive high-tech, new-tech and modern services industrial growth node. Functional connections with Guangzhou’s core city were established and Nansha developed regionally as an important strategic node within the Guangzhou–Hong Kong–Macao (GHM) growth corridor and a global gateway served by port logistics. Nansha State-level New Area was designated as one of three key centres for strengthening GHM co-operation as articulated in the *12th Five-Year Plan for National Economic and Social Development* (The State Council, 2011). However, Nansha still lacks the appurtenances of an attractive living environment, such as urban services and local amenities. ‘Quite a number of people work in Nansha, but live in Guangzhou’s central city or Panyu district’ (interview with governmental official, Nansha)**{Please give date of interview [month and year]}**. An entrepreneur indicated some of the resultant recruitment challenges, ‘It is difficult to recruit people, especially talented individuals, as there is a serious shortage of services here’ (interview with entrepreneur, Nansha) **{Please give date of interview [month and year]}**.

## <H1>Governance arrangements</H1>

<H2>County-level governance</H2>

In 1990 the development of Nansha became a common concern to both Guangdong province and Guangzhou city. It was identified as a key development area, and the Nansha Economic Zone Management Committee (*jingjiqu guanweihui*) was established as a county-level unit governed by Panyu county (Nansha Chronicles Office, 2011). Since then, Nansha’s development has been recognized as being highly significant at the national level, reflected in three major visits by national leaders over the next three years. Subsequently in 1992, the national State Council approved Nansha port as a foreign trade port, an important window for China’s ‘opening-up’ strategy. In the following year, Nansha NETDZ was also established by the State Council. This was the second NETDZ in the Guangzhou city region, and recognition of the strategic importance of both Guangzhou and Nansha, in helping to realize national ambitions. The Management Committee of Nansha NETDZ that was established was closely aligned to the former Economic Zone Management Committee, which, at the time, had been an agency of Panyu county.

<H2>Municipal-level governance</H2>

 The *2000 Outline of Guangzhou Overall Strategic and Concept Plan* (Guangzhou Municipal Government, 2000) proposed an urban spatial structure that could be summarized by an eight-word set of principles: ‘southward expansion, northward optimization, eastward extension, westward combination’. Nansha became one of the key nodes of Guangzhou’s polycentric development strategy, and the core area of Guangzhou’s southward spatial and industrial extension. Nansha Development Zone Construction Headquarters (*kaifaqu jianshe zhihuibu*) was officially established in 2001. This body was to be solely in charge of the planning, construction and management of the development zone. It was given the same authority (approval rights and management privileges) as the Guangzhou Municipal Government (Nansha Chronicles Office, 2011), extending beyond the previous county-level governance powers and responsibilities. In the same year, the Guangzhou Municipal Government held a site meeting in Nansha with the purpose of promoting the area’s development. This has subsequently been regarded as the prelude to the ‘Big Nansha’ development (*ibid.*). The main developmental focus of the new Nansha Development Zone was to follow an industrially driven and project-oriented model designed to build a centre for heavy industries in the PRD (Lin, 2013). Against this background, the construction of the Nansha Development Zone entered a new stage. A series of heavy industrial projects were attracted to, and located in, Nansha. As one interviewee explained, ‘the “Big Nansha” development, at that time, mainly aimed at developing four types of industries: steel, logistics, port and petrochemical industries. Nansha’s positioning during the early “Big Nansha” period was just about industrial development’ (interview with planner, Nansha) **{Please give date of interview [month and year]}**.

 The *2004 Nansha Area Development Plan* (GMPB, 2004), was the first programmatic planning document in Nansha’s history. It established the leading development idea of ‘big industry, big logistics and big transportation’. ‘This document, at this time, treated Nansha as an independent city. Thus, comprehensive consideration was given to its future development. Indeed, the plan provided some effective guidance for nearly a decade’ (interview, planner, Nansha) **{Please give date of interview [month and year]}**. It was clear that Nansha’s initial development trajectory relied only on locally based development opportunities; then, under provincial and central government-led initiatives, it began to experience rapid industrial development and expansion of the core infrastructure connecting it to the city region and beyond. In 2005 Nansha District was officially established, covering a total area of ​​544.12 km2. In 2008 the governing body of Nansha Development Zone was changed back to Nansha Development Zone Management Committee, which took over the management privileges of the Nansha Development Zone Construction Headquarters (Nansha Chronicles Office, 2009). ‘The development focus of Nansha turned from simply concentrating on economic development to a more comprehensive construction of Nansha, including its economy, environment, living quality, public services, etc.’ (interview with planner, Nansha) **{Please give date of interview [month and year]}**. Nevertheless, at this point, Nansha’s industrial development strategy still followed the lines of the previous heavy-industry-oriented development mode, with the secondary sector contributing 79.6% of Nansha’s GDP in 2009 (see Table 3). The driving force behind these changes was the strong support of national and municipal governmental policies.

 <H2>Multi-level governance</H2>

 Since 2010, Nansha’s development has attracted more and more attention, associated with its more prominent economic and strategic position in Guangzhou. Under the recent adjustments to the application of polycentric planning principles in Guangzhou city region, the aim of which is to seek a real sense of developing a polycentric city-regional structure with balanced development, Nansha became one of the six subcentres in the *Guangzhou Master Plan (2011-2020)* (GMPB, 2012). In 2011, with the release of *12th Five-year Plan for National Economic and Social Development* (The State Council, 2011), the development of Nansha became recognized as being of national significance. It was explicitly recognized as an integral part of the national strategy. Later, in 2012, Nansha became the sixth State-level New Area and was planned as an important economic pole within southern China. These state-level strategies cemented Nansha’s position as a significant place in Guangzhou city region, Guangdong province and indeed the whole nation, encouraging and enabling it to participate in international competitions and co-operations.

 With these changes in both its status and role, the governing bodies and governance structure of Nansha also changed. Unlike many other district governments, the governance arrangements for Nansha started to involve many different levels of government as well as various non-governmental actors. Its local government was granted the same level of decision-making authority as Guangzhou Municipal Government, with powers and responsibilities also being decentralized to Nansha from the Guangdong Provincial Government. Multi-level governance for Nansha needs, therefore, to be looked at from two perspectives: first, as a complex but coherent governance structure; second, as the result of some decentralization of power from Guangzhou Municipal Government.

From the first perspective, as a result of its various functional identities, Nansha is governed by governmental and non-governmental actors at the national, provincial or regional (especially the GBA), municipal (Guangzhou) and district (Nansha) levels. First, at the national level, because of the NETDZ, a State-level New Area, and the FTZ, Nansha has been designated as responsible for significant national economic and social development objectives through a series of national policy guidance documents. Second, at the provincial or regional level, more recently, a number of non-governmental platforms have been established with the aim of promoting the integration of the 11 city regions within the GBA. These platforms include, for example, the GBA Forum, GBA Innovation Economy Summit, GHM Cooperation Forum, GHM Bay Area Quality Forum, and so on. Government officials from Guangdong, Hong Kong and Macao, academics and professionals, as well as entrepreneurs have gathered together to help address regional and cross-regional problems through discussions and negotiations. Third, at the municipal level, as a subcentre of Guangzhou city region, planning and policies have provided direct guidance and support to Nansha’s future development. Finally, at the district level, Nansha is co-governed by the Nansha Development Zone Management Committee and Nansha District Government. Despite the fact that ‘Small Nansha’ was initiated by private investors, Nansha NETDZ and Nansha FTZ are governed by the same agency, the Nansha Development Zone Management Committee. Nansha District and Nansha State-level New Area are under the direct governance of Nansha District Government (see Table 2). The Management Committee has a significant degree of autonomy within the area under its jurisdiction. It has been given municipal-level approval rights and management privileges. This kind of multi-level governance indicates an important feature of Chinese edge urban areas in helping to create a polycentric structure, as it emphasizes the interdependencies both between governments at different levels, and between governments and non-governmental actors.

 Regarding the decentralization of some power to the Nansha State-level New Area, in 2013 the Guangdong Provincial Government announced *Order No.180 of the People’s Government of Guangdong Province* implementing approval rights and opening a ‘green channel’ for Nansha State-level New Area (People’s Government of Guangdong Province, 2013). This ‘green channel’ changed the traditional vertical governance arrangements in Chinese provinces: provinces–municipalities–districts. Nansha, as a district, was empowered to have a direct channel to report on a total of 23 management matters directly to the provincial level without going via the Guangzhou Municipal Government as before. Meanwhile, a series of preliminary review or approval rights were decentralized by the Guangdong Provincial Government to the Nansha State-level New Area—for example, on foreign investment projects, enterprise investment projects, land use for construction projects, and these were further deepened in 2015 (People’s Government of Guangdong Province, 2015). This means that Nansha has a significant degree of autonomy from Guangzhou Municipal Government having been granted preliminary review or approval rights for the activities listed above, relating to the construction and management of Nansha.

 Although empowered with various activities and a certain degree of power, Nansha still has limited autonomy in terms of controlling urban sprawl. Approval of urban construction land (People’s Government of Guangdong Province, 2019) and the establishment of major development strategies, for example, remain with the provincial and municipal governments. Nansha has experienced significant changes in positioning, which merely reflects the conflicts between the power exercised by the upper levels of governance and its own local needs and aspirations. Projects planned under the heavy industry relocation strategy were never built, largely because of changes in emphasis and prioritization for the area by upper-level governments. Some ambiguous negotiations and conflicts during the redefining of these project objectives were articulated through the interviews with Nansha’s local planners. For example, ‘the Kuwait Oil Refinery was once planned as the largest project in Nansha’s history, but it was not built in the end. Every leader has his own ideas. When the leader changes, development ideas also change accordingly. What’s more, the Wanqingsha area and Mingzhu Industrial Park were both initially planned to develop industries, but both their positions have changed significantly as Wanqingsha is now a duty-bonded port area and the Mingzhu Bay Area has become the urban core of Nansha’ (interview with planner, Nansha) **{Please give date of interview [month and year]}**.

#  <H1>**Conclusions</H1>**

Nansha was originally an outer suburban town with a landscape composed of numerous rural villages in the Guangzhou city region of southern China. It has experienced several shifts in its relative positioning as a settlement in its own right and in the metropolitan and wider region. This has resulted in significant changes to its planning approaches and governance arrangements. It has gone from a suburban town in Guangzhou’s outer suburbs, to a NETDZ, to one of the administrative districts of the Guangzhou city region, and more recently to a State-level New Area and part of Guangdong’s Pilot FTZ. In terms of its functions, Nansha’s position has changed from an orientation towards heavy industry to a more balanced and comprehensive set of functions, with Nansha port as its dominant feature. From spatial, functional, and governance perspectives, it can be concluded that Nansha has emerged as an edge urban area within Guangzhou’s polycentric spatial structure, albeit with a unique development trajectory (see Table 5).

<INSERT TABLE 5 NEAR HERE>

 From the establishment of Nansha as an Economic and Technological Development Zone in 1993, its development trajectory has not been a simple linear process. There have been uncertainties with regard to its positioning and unexpected adjustments in its planning. However, with its increasing interdependencies with Guangzhou’s core city, both spatially and functionally, as well as its recent multi-level governance arrangements, it is emerging as an edge urban area helping to deliver the polycentric structure of Guangzhou city region. What is more, both spatial and functional linkages have been established, or are being established, between Nansha and its surrounding cities or regions, making it a significant growth pole within the wider PRD or the GBA. Undoubtedly, many challenges have been experienced during its transformation process. These mainly arise from conflicts between municipal and local governance arrangements, the transformation of its economic structure and the inadequate level of general service provision. A number of aspects require more attention, including better planning for more efficient land use, the need to improve inter and intra transportation links, and an urgent need for the construction of social infrastructure.

 The emergence of edge cities or polycentric cities or regions worldwide has attracted the attention of many researchers. However, scholars tend to look at them separately, and little research has explored them as part of an integrated whole. Thus, few studies have examined the formation of edge cities in conjunction with promoting polycentricity. The same is true within the Chinese context, where there is little insight into how edge urban areas have been planned by strategic planners as a means to promote polycentricity. The experience of Nansha helps gain a better understanding of a new mode of polycentric practice featuring the active promotion by the state of edge urban areas. This creates a different narrative from the one typically associated with US or Europe edge cities, which are often organically or spontaneously initiated by the actions of private developers (Bontje and Burdack, 2005) and formed during the suburbanization process to support new polycentric structures. In China, edge urban areas have increasingly been deliberately planned as part of a polycentric development strategy for mega city regions, in which the state, through land ownership and interventionist policies, supports edge urban areas, provides them with an initial impetus and constantly drives their dynamics in a very clear and direct way. Nansha is a product of planning that was managed and developed mainly within the complex dynamics of national, municipal and local governance. The establishment of NETDZ by the state marks the start of Nansha’s development process. Recent studies have also noted other typical cases of the mutation of ETDZs into edge urban areas in China (Miao and Hall, 2014; Miao *et al*., 2019). The follow-up actions, including the award of national strategic roles to Nansha as a State-level New Area and an FTZ, are all attempts by the state to ensure it fulfils national priorities. These national strategic roles have empowered Nansha’s local government, helping it to gain some decentralized power, indeed often enabling it to exercise the same powers as the ‘higher- level’ Guangzhou Municipal Government. Therefore, we suggest that the role of the state in its many guises is leading to the emergence of Chinese edge urban areas and thus contributing to the realization of a more polycentric regional development pattern.

 This article has taken an historical perspective and explored the development trajectory of an edge urban area within the Chinese context. Evidence from Nansha reveals some of the mechanisms that have enabled edge urban areas to become supported as part of wider polycentric practices within wider mega-city-regional development. Although an isolated case, Nansha is, we would argue, a typical one, as its development processes are driven by strong state interventions and consistent policy support. The measures taken in establishing spatial connections and functional linkages between Nansha and the core city, the efforts made to involve different levels of government and various non-governmental actors in promoting multi-level governance, characterize other Chinese mega city regions with the aim of better promoting polycentric development strategies. Furthermore, the proposed analytical framework provides a useful tool for exploring edge urban areas in other city regions in China, or in other cities or regions with similar developmental trajectories across the world.

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article

<FN1>In this article, the term city region (*shi yu*) in China refers to the entire administrative area of a city, which often comprises a central or core city and its surrounding districts, counties or county-level cities.

<FN2>Considering the vastly different social, political and economic development contexts of cities and regions in the US, Europe and China, this article avoids applying the exact term *edge city* but uses the term *edge urban area* to explain the evolution of subcentres, within a polycentric spatial structure, at a city regional scale in China.

<FN3>Guangzhou’s core city incorporates four whole districts, Tianhe, Haizhu, Liwan and Yuexiu, part of the southern Baiyun district, and the middle and southern parts of Huangpu district (GMPB, 2012).

<FN4>They are Dongchong town, Lanhe town, Dagang town, Huangge town, Hengli town, Wanqingsha town, Nansha street, Zhujiang street and Longxue street. Beneath the city are districts, and within the districts are streets and towns. Streets and towns represent the lowest geographical level at which census data is collected and released in China. The difference between streets and towns is that a street is always urban, while a town can be a place within an urban district but also a place in a rural county (Wu and Phelps, 2011).

<FN5> Guangzhou port as a whole consists of four port areas: Guangzhou’s own inner port and Huangpu, Xinsha and Nansha ports.

<FIGURE CAPTIONS>

<FIGURE 1 CAPTION>

**FIGURE 1** Location of Nansha within Guangzhou city region and the Greater Bay Area, China (*source*: Nansha Government, 2017)

<FIGURE 2 CAPTION AND NOTE>

**FIGURE 2** Changes in the administrative areas of Panyu and Nansha districts

NOTE: The three towns are (a) Lanhe, (b) Dongchong and (c) Dagang

<FIGURE 3 CAPTION>

FIGURE 3 The existing and emerging real estate communities in Nansha (photo by the authors) {Which of the two authors took the photo?}

**<TABLE CAPTIONS>**

<TABLE 1 CAPTION>

TABLE 1 An analytical framework for exploring Chinese edge urban areas

<TABLE 2 CAPTION & SOURCE>

**TABLE 2** Changes in administrative organizations with different identities in Nansha

SOURCE: Authors’ research and summary

<TABLE 3 CAPTION & SOURCE>

**TABLE 3** Change in Nansha’s economic structure 2009-2017 (%)

SOURCE: Nansha Statistical Bureau (2009**–**2017)

<TABLE 4 CAPTION & SOURCE>

TABLE 4 The cargo throughput of Nansha port and Guangzhou port from 2010 to 2018

SOURCES: Guangzhou Statistical Bureau, 2011**–**2019; Nansha Statistical Bureau, 2010–2018

<TABLE 5 CAPTION & SOURCE>

TABLE 5 Key themes explored in Nansha as a Chinese edge urban area