

Changing urban form in a planned economy: the case of Nanjing

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Abstract. *Plots have consistently provided effective evidence in interpretations of urban transformations. In a market economy they are profitable land units involving capital, and they play an important role in urban development. However, it is unclear what role plots play in a planned economy, where they lack exchange value and only have value in their use for supporting buildings. In China during the socialist period from 1949 to 1988, the land unit for urban construction was freely allocated land. The process of plot metamorphosis was dominated by the planned economy system, and it progressed through the creation and changes in the physical form of danweis. The specifics of the morphological process in this political and economic system merit investigation. This paper examines the morphological transformation of part of the central commercial district of Nanjing from 1949 to 1988. It explores the system of land occupation, widens morphological knowledge and complements the contribution of M. R. G. Conzen to methods of historico-geographical investigation.*

Keywords: planned economy, land policy, danwei, plot metamorphosis

Urban morphology was long ago shown to be an important means of studying the process of urban development through the investigation of urban form. It also provides a valuable basis for the work of urban planners and architects. This capability was evident in Conzen's townscape analysis (Conzen, 1960) and subsequently emphasized in morphological studies in Italy and France (Caniggia and Maffei, 2001; Panerai *et al.*, 2003) in which various morphological elements were examined as evidence of urban development. By investigating these elements, urban form was shown to be amenable to systematic analysis (Kropf, 2009). More significantly, a historico-morphological analysis was recognized as providing a clearer understanding of how the town plan (or ground plan) is the cumulative result of a diverse process of interrelated

economic and social developments (Conzen, 1960, 1981, 1988; Whitehand, 2001): an aspect that has for long been neglected in urban planning and urban design. However, this type of investigation has hitherto been undertaken almost entirely in areas where a market economy prevails. And the context of a parcel of land in a market economy is very different from that in a planned economy. China has been run under a planned economy since 1949 and gradually transformed to a socialist market economy after 1992. In trying to understand the recent urban forms and spaces in China, it is necessary to study urban development by linking the nature of the economy to the urban morphological process (Kropf, 2011; Whitehand, 2007).

The Conzenian urban morphological school has explored to good effect the interlocking

morphological elements at three levels: the street, the plot and the building (Gauthiez, 2004; Moudon, 1994, 1997). Of these levels, the street (and street-block) is strongly interrelated with the urban structure of the entire city. This means that it is affected by urban top-down decision making and not exclusively reliant on the market, whereas the plot and the building are strongly influenced by individual developments closely related to the market. Moreover, previous research has demonstrated that the investigation of plot patterns and plot dimensions is important not least because the plot and its process of change are part of a town plan's life history (Conzen, 1960, 1981; Slater, 1981, 1987, 1990). The study of Alnwick has shown that the residual features passed down through successive generations of society and the morphological characteristics of the plot reveal much of the history of urban physical change. Subsequent studies have also scrutinized the layout, performance and transformation of plots (Sanders and Woodward, 2015; Siksná, 1997). These studies suggest that the fundamental elements of the 'plot' are suitable to be employed for understanding morphological development in various legal systems, including the planned economy-based urban morphological transformation in China.

Looking back at the history of urban construction, it is evident that Chinese cities have been exposed to three different political and economic systems: a peasant economy before 1949, a planned economy from 1949 to 1992, and a so-called socialist market economy after 1992. Among the previous morphological investigations in China, many have concentrated on historical cities or historical preservation areas. For instance, the historical investigations of the old town of Pingyao (Whitehand and Gu, 2007), the Guanqian area of Suzhou (Chen, 2012), the Guangfunan area in Guangzhou (Li and Gauthier, 2014), and the *lilong* unit of Shanghai (Whitehand *et al.*, 2014) have provided valuable results. The investigations of modern Chinese cities have revealed that their morphological characteristics differ greatly from those of typical Western cities (Chen and Thwaites, 2013; Zhang and Ding, 2013). Scholars have noted that the

Chinese morphological process is difficult to envisage in a Western-style market economy (Whitehand *et al.*, 2011). Accordingly, some studies have attempted to inspect morphological changes in different socio-economic environments, such as the rapid urbanization of Hainan Island in the transitional economy of China during the twenty-first century (Gu, 2001; Gu and Wall, 2007) and the transition process from feudal times to the present day in part of the core of Guangzhou (Zhang, 2015). These studies show that morphological processes fundamentally rest on social, political and economic processes and that morphological characteristics in a planned economy system need to be further explored.

Previous urban morphological studies in Europe and the United States have been primarily based on the consistent superstructure of the market economy, characterized by private land ownership and land transactions, which have provided a paradigm for the research. However, there is a need to consider more closely the large differences in the social and economic policies between Western countries and China, particularly after 1949. In the planned economy period, Chinese cities were characterized by state-owned land, and the government controlled land requisition and allocation based on a top-down approach. Given these differences, Chinese cities are well worth investigating to assess how a planned economy system has an impact on plot development.

Accordingly this paper investigates urban plot transformation during the planned economy period in China. It attempts to answer two questions in particular. What were the most influential factors during the transformation process? Did urban plots play the same role in the planned economy as in other types of economy and, if not, what were the differences?

Method

Research area

Nanjing, a city with a history of more than 1800 years, was chosen for the case study. It has long played a leading role as a national or

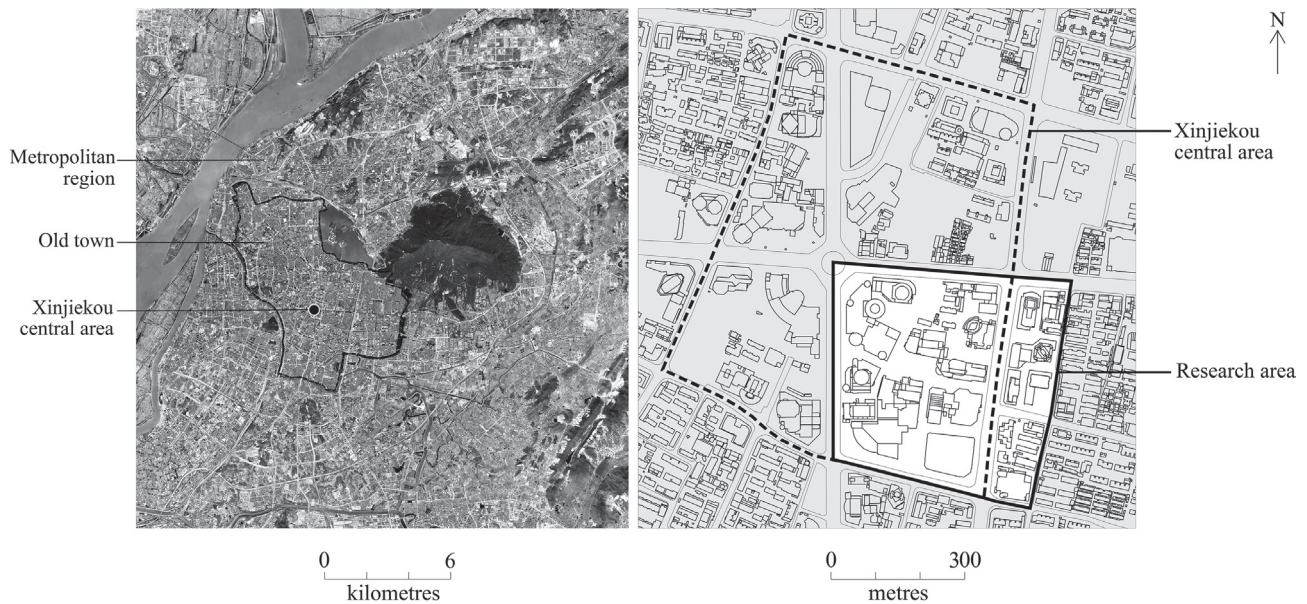


Figure 1. Research area and its location in Nanjing. Source: Google image from 2004 and land-use map of 2007 from the Nanjing Planning Bureau.

regional city. It was the ancient capital of the six dynasties. It was also the national capital during a large part of the Republican Period of China, from 1912 to 1937. Although Nanjing is no longer the national capital, as the provincial capital of Jiangsu it is still the developmental cornerstone of the region.

The Xinjiekou district is located at the geographical centre of Nanjing, and it became the city's business centre in 1929. Since then its status as the centre of the city has continued. The most sensitive and representative development is the core area within the 'Xinjiekou ring road'. Here physical forms reflect the effects of the political and economic strategies implemented in different periods, particularly in the south-east quadrant (Ding *et al.*, 2007). Based on former studies of the Xinjiekou district, including research on the process of its plot development (Zhang and Ding, 2013), a quarter of the Xinjiekou city centre and adjoining street-blocks to the east were used for this study (Figure 1).

Maps and plans

Morphological investigations depend heavily on historical maps and other tangible

evidence. Several types of cartographical evidence are important, revealing changes to the streets, plots and building block-plans. There are also building documents recording changes. However, research on Chinese urban form is handicapped by a lack of true ground plans (Gu and Zhang, 2014; Whitehand and Gu, 2006). Chinese city maps usually show the street system, but information about plots and buildings is generally lacking.

The research materials were mainly collected from the Nanjing Urban Construction Archives (NUCA), which is the organization in charge of all urban planning and construction documents in Nanjing. Cadastral plans showing land ownership were the most valuable source. Although they are available for this area only for the years 1936, 1952 and 2007 (Figure 2), they are crucial for articulating how the urban landscape has developed. Land-use maps also provide evidence of urban physical changes (Figure 3). The land-use maps of the whole research area for the years 1952, 1974, 2000 and 2007 provide the positions of buildings. Aerial photographs from 1929, 1949, 1976, 1990, 2001, 2003 and later provide extensive coverage of

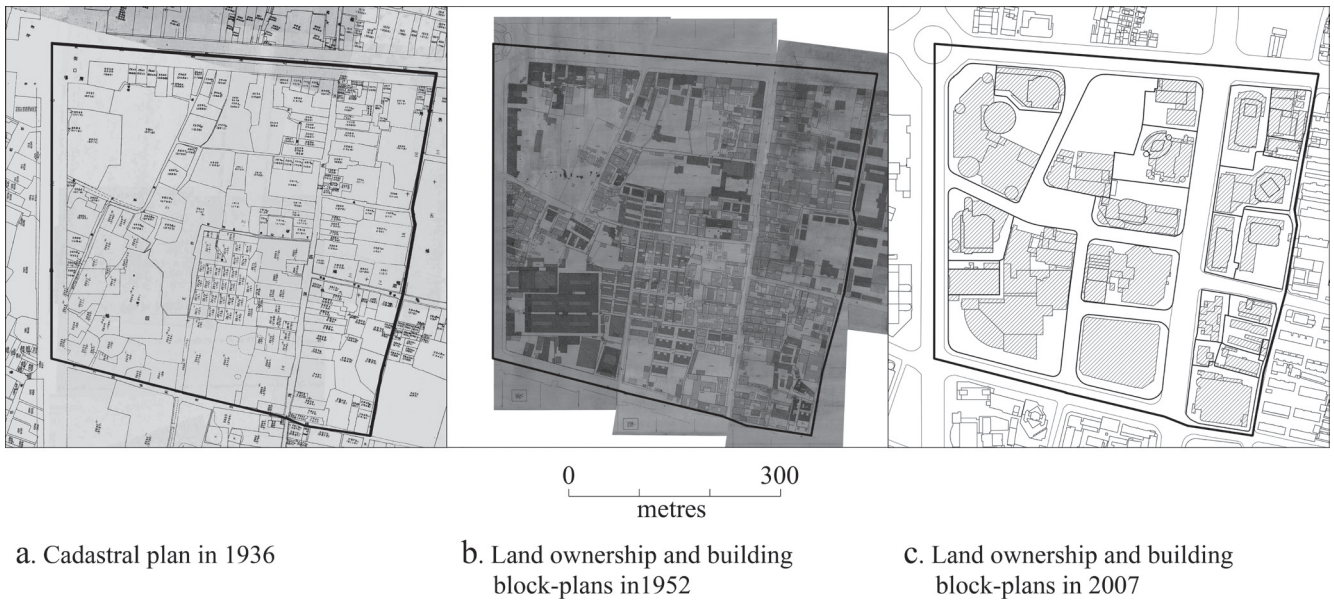


Figure 2. Maps of land ownership. Sources: map of 1936 from the Academia Sinica Digital Centre, Taiwan and maps of 1952 and 2007 from NUCA.

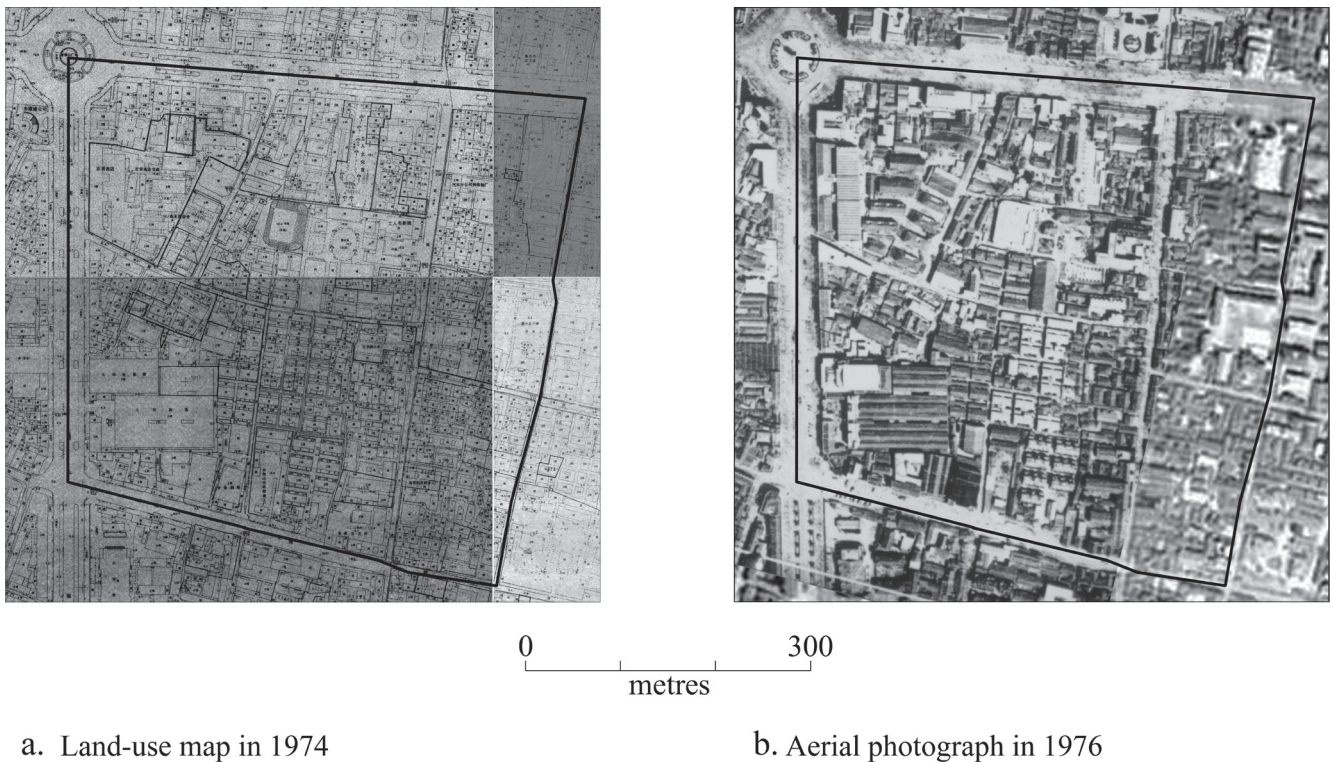
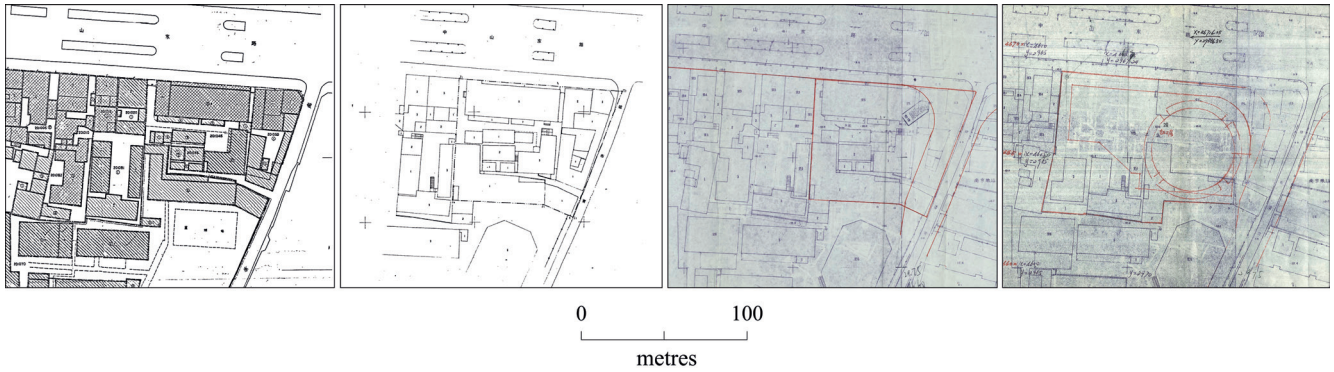


Figure 3. Land-use map and aerial photograph of the research area. Source: NUCA.

urban form and help to show such features as road developments and changes to buildings (Figure 3).

In China, all construction projects since 1949 have required both land use approval from the Land and Resources Administration



a. Granted by Nanjing Housing Administration Bureau. The land-use map shows the building property rights. Example of 1986.

b. Granted by Nanjing Land and Resources Administration Bureau. The confirmation of land use pinpoints the location of land tenancy. Example of 1992.

c. Granted by Nanjing Planning Bureau. The approved plot distribution document shows the original building block-plans on and around the site. Example of 1992.

d. Granted by Nanjing Planning Bureau. The approved building positioning line shows the location of the new building block-plan and the relation to its new plot boundary. Examples of 1997.

Figure 4. Main components of the project construction documents in NUCA.

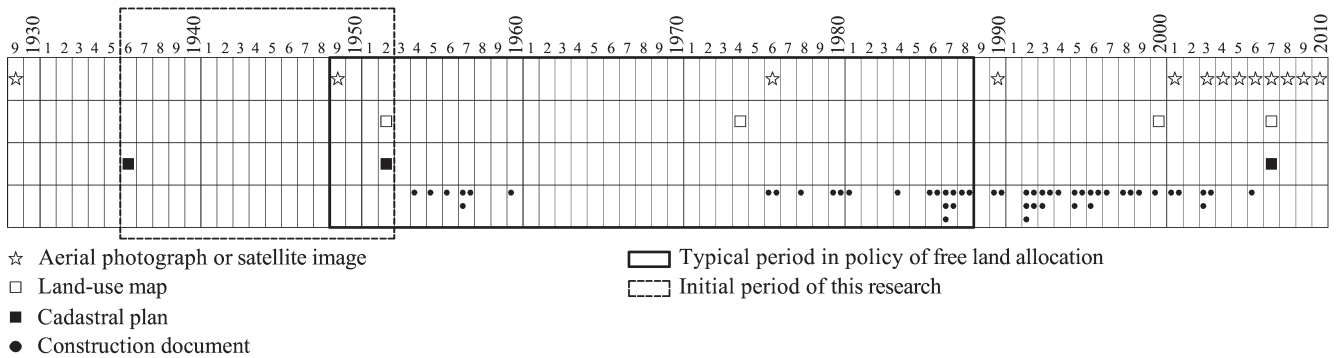


Figure 5. Chronology of sources.

Bureau and functional confirmation and a construction permit from the Planning Bureau. After construction, buildings must be registered with the Housing Administration Bureau (Figure 4). Thus, a series of construction documents is available for each project. Among them, the red line of the approved plot distribution is firm evidence of development (Figures 4b, 4c, 4d). These approved documents not only show the block-plans of the original buildings within and outside the construction site but also distinguish the buildings of new stakeholders.

The aforementioned varied records allow a chronology of changes to building block-plans,

plots and street-blocks to be compiled (Figure 5).

The danwei as an urban form

After 1949, the ‘work unit system’, or *danwei*, became the basic unit and subsystem of urban society in China (Bray, 2005). A *danwei* is actually a social tax payment entity, such as a department store, cultural institution, government body, factory or school. At the same time it is the spatial expression of the land-use unit in this Chinese system. As the ‘cells’ of society, many *danweis* have separate

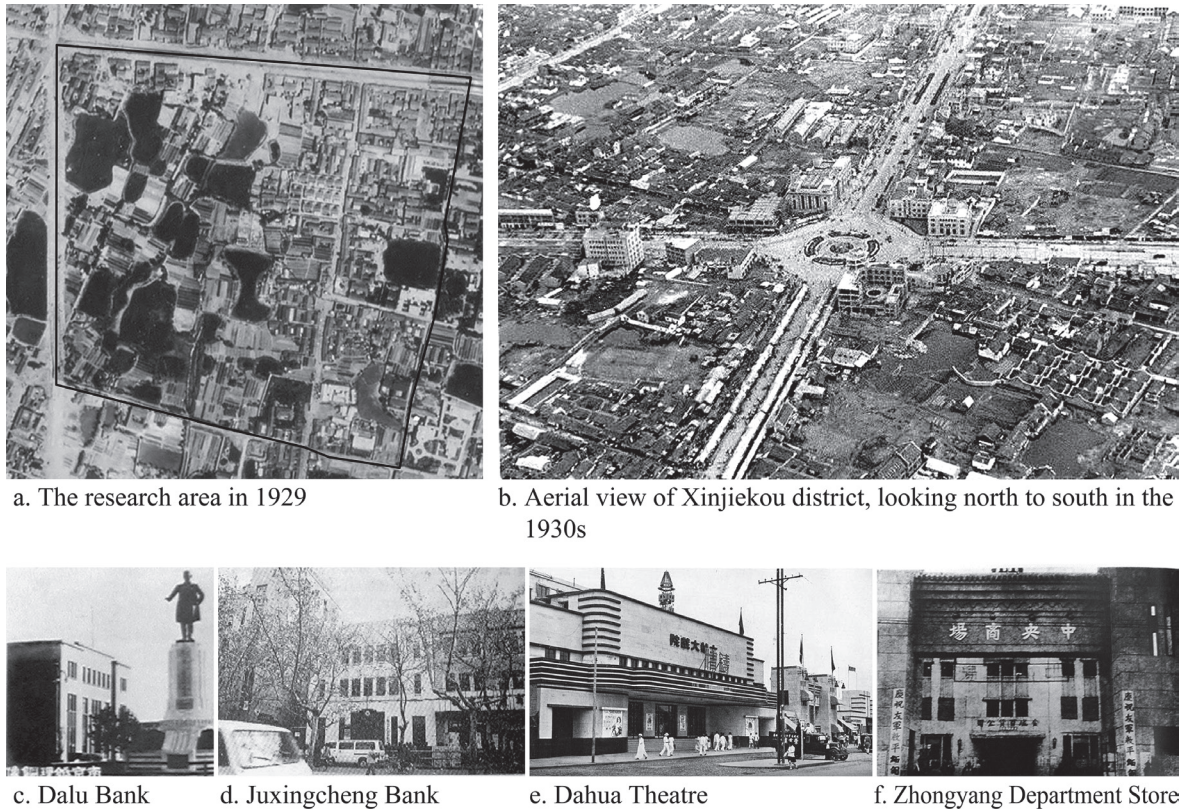


Figure 6. Transformation of the Xinjiekou district from residential area to the most important commercial traffic centre in Nanjing. Sources: (a) United States Library of Congress; (b-d) Local chronicles of Jiangsu province; (e) <http://www.xici.net>; (f) Lu and Yang (2001) p. 272.

identities that are emphasized by physically enclosed forms and supervised entrance gateways. Their existence as organizational forms has continued, although the creation of new danweis gradually ended after 1988, when land markets were authorized. The creation and development of danweis has led to plot metamorphosis, which provides clues to understanding the development of a town plan (Lu, 2006). Accordingly, project construction documents are the major evidence used to determine the spatial extension of danweis.

Because all civic land is owned by the state and land policies were restricted by the planned economy system of China, the government centralized the administration of land resources. State-owned land is free, can be used indefinitely, and is not alienable. In general, as suggested by the development plans of various ministries and commissions, local

governments engaged in land expropriation and land-use distribution. This means that the land units of danweis were only territory for supporting buildings. Operationally, land assignment was conducted by allocating buildings, since buildings were also the means of production owned by the state. Accordingly, the plots of danweis were delimited based on the buildings' occupation. Hence the boundaries of plots were the result of danwei development, rather than urban landscape planning. Given this situation, the characteristics of buildings are crucial for understanding the process of plot metamorphosis.

Initial base plan

The construction of new urban primary roads from 1929 to 1937 triggered the conversion of the Xinjiekou district from an urban

residential area to the most important commercial traffic centre in Nanjing (Zhang and Ding, 2013) (Figures 6a, b). During these road construction projects, Nanjing experienced a short-lived building boom. Five important buildings were constructed within the research area: Dalu Bank (built in about 1932, Figure 6c), Juxingcheng Bank (built in 1934, Figure 6d), Dahua Theatre (built in 1935, Figure 6e), Zhonghua Theatre (built in 1935) and Zhongyang Department Store (built in 1936, Figure 6f).

The maps of 1936 and 1952 are the cartographical bases for the initial period of research (Figure 5). They show that the building block-plans in 1952 were in accord with the plot pattern in 1936 (Figures 7a, b). Only 20 of the great many buildings did not conform to the ownership boundaries in 1936: these comprised six thatched shacks and fourteen buildings for which the updates of the plot boundaries had been delayed. Literary sources indicate that owing to the Sino-Japanese War and the War of Liberation, only one project, a 400-seat hall (Jieshou Hall in Figure 7c), was built in 1946. Except for one new plot development and several plot metamorphoses that occurred before 1949, practically all the buildings and most of the plots already existed. Accordingly, a map of 1949 can be reconstructed (Figure 7c).

Plot metamorphosis in relation to the policy of free land allocation

Based on the available, mainly cartographic, sources, the research period was divided into three phases. In 1949, New China was founded. Urban land was gradually nationalized, and the planned economy system was prepared over the next 3 years. The following years were the main period of the planned economy. With the Reform and Opening-up Policy in 1978, the planned economy system gradually disintegrated. The revision of the Chinese Constitution and Land Administrative Law in 1988 completely changed the land administrative system. After 1988, trading of land-use rights through land auctions was

legalized, and the former land policy of free allocation began to be phased out.

Danwei development 1949 to 1952

Many danweis were created in the early years of New China. Certain new urban functions were imbedded within the research area, such as the Workers' Cultural Palace, bookstores, and government agencies. Many residential areas remained unaltered. Most new danweis accessed land from the local government and were confined within buildings that already existed in 1949. The boundaries of many danweis were strictly defined by the boundaries of existing buildings (Figure 8a). However, because there was still considerable idle land, vegetable gardens, and even small water features in this area, a few danweis partially adopted the boundaries of the original plots (Figure 8b).

Danwei development 1953 to 1977

In order to meet the 'living needs' of the people, physically and spiritually, danweis served both commercial and cultural purposes. Factories, department stores, the Workers' Cultural Palace, schools, and cinemas were given priority for development in this period. As major social improvements, they were all funded by local government or the relevant ministries. With regard to the land application procedures, due to the absence of urban planning it was the danweis themselves that were responsible for seeking and applying for suitable sites for their development. Unused land, and adjoining land with poor-quality buildings, was attractive for danweis. Consequently, their boundaries had a much closer relationship to the original buildings (Figure 9).

Danwei development 1978 to 1988

Following the hiatus of the Cultural Revolution, the national economy underwent a full recovery. Two fresh impetuses stimulated the development of the Xinjiekou area. First, it was endorsed as the central business district



Figure 7. (a) cadastral plan of 1936, (b) building block-plans of 1952, and (c) reconstructed ground plan of 1949.



..... Unit boundaries do not follow original building boundaries ■ Buildings allocated to work units
 - - - - - Unit boundaries follow original building boundaries ▨ Folk houses or residential buildings

The major work units: 2. Bank; 3. Dahua Theatre; 4. Zhongyang Department Store; 5. Zhonghua Theatre; 7. Zhongnan Bank; 15. Xinbai Department Store; 20. The Xinhua News Agency Jiangsu Branch; 21. Xinhua Bookstore; 29. East China Ministry of Industry, Nanjing Office; 31. Workers' Cultural Palace; 44. Zhenghongjie Primary School; 45. School-run factory; 49. Huaihai Clinic; 50. Dormitory units of Nanjing Federation of Trade Unions; 52. Rotation shaft factory; 54. Enterprise Bureau of Logistics Department of Nanjing Military Region Command; 59. The No. 15 Middle School; 66. Auto accessories manufactory.



Figure 8. Danweis formed by obtaining the use rights of buildings in 1949–52, thereby shaping the plot pattern in 1952: (a) buildings occupied by danweis; (b) plot pattern in 1952.



..... Unit boundaries do not follow original building boundaries
 - - - - - Unit boundaries follow original building boundaries
 Buildings allocated to work units
 Folk houses or residential buildings

The major work units: 2. Bank; 3. Dahua Theatre; 4. Zhongyang Department Store; 5. Zhonghua Theatre; 7. Bank; 15. Xinbai Department Store; 20. The Xinhua News Agency Jiangsu Branch; 21. Xinhua Bookstore; 29. East China Ministry of Industry, Nanjing Office; 31. Workers' Cultural Palace; 44. Zhenghongjie Primary School; 45. Electrical equipment factory; 49. Huaihai Clinic; 50. Dormitory units of Nanjing Federation of Trade Unions; 52. Rotation shaft factory; 54. Enterprise Bureau of Logistics Department of Nanjing Military Region Command; 59. The No. 15 Middle School; 66. Auto accessories manufactory; 80. Foreign Economic Relations & Trade Commission, Nanjing Office.



Figure 9. Danweis growing or shrinking by obtaining the use rights of buildings in 1952–77, thereby shaping the plot pattern in 1977: (a) buildings occupied by danweis; (b) plot pattern in 1977.

of Nanjing in the first 'Nanjing Master Plan' in 1980. Secondly, the Reform and Opening-up Policy established in 1978 mandated that personal investments were acceptable in commercial and public building construction. Commercial projects in this area were strongly encouraged, and several commercial buildings were constructed. The large amount of construction gave rise to traffic congestion in the city centre. Therefore, at the beginning of the 1980s, the local government pressed ahead with upgrading the municipal infrastructure. Accordingly, the project to widen Hongwu Street, which was one-quarter of the Xinjiekou ring road project, was approved in 1986, triggering plot redevelopment on the east side of Hongwu Street. As a result of the improved road structure, a large number of motor vehicles were introduced, and crossing the urban primary roads became increasingly unsafe for pedestrians. This led to the reorganization of the traditional 'tree-like' urban road system and the creation of breakthrough routes to accommodate the growth of shopping activities within the street-blocks. The danweis were fully developed, both along the streets and within their street-blocks (Figure 10a). Accordingly, a new plot pattern had formed by the end of the 1980s (Figure 10b).

Analysis of the influence of buildings

Building quality was a major consideration in determining danwei boundaries (Figure 11). Taking 1949–52 as an example, only a few buildings did not conform to the boundaries of danweis. Ten of those buildings were thatched shacks, six were old-style bungalows, and one was a new-style bungalow. Buildings of relatively good quality, such as single- and two-storey houses, regardless of their age, accorded with the new plot boundaries. The thatched shacks were considered for a potential branch road between danweis (Figure 11a). The operational rule of free land allocation had another effect. When a building was allocated as a means of production, its accompanying outdoor structures were allocated with it (Figure 11b).

Up to 1988, 136 danweis had come into existence. Among them, 79 were created in 1949–52, 42 in 1953–77, and 15 in 1978–88. Thus the 235 plots existing in 1936 were transformed into 123 plots by 1988 within an area of 21 ha.

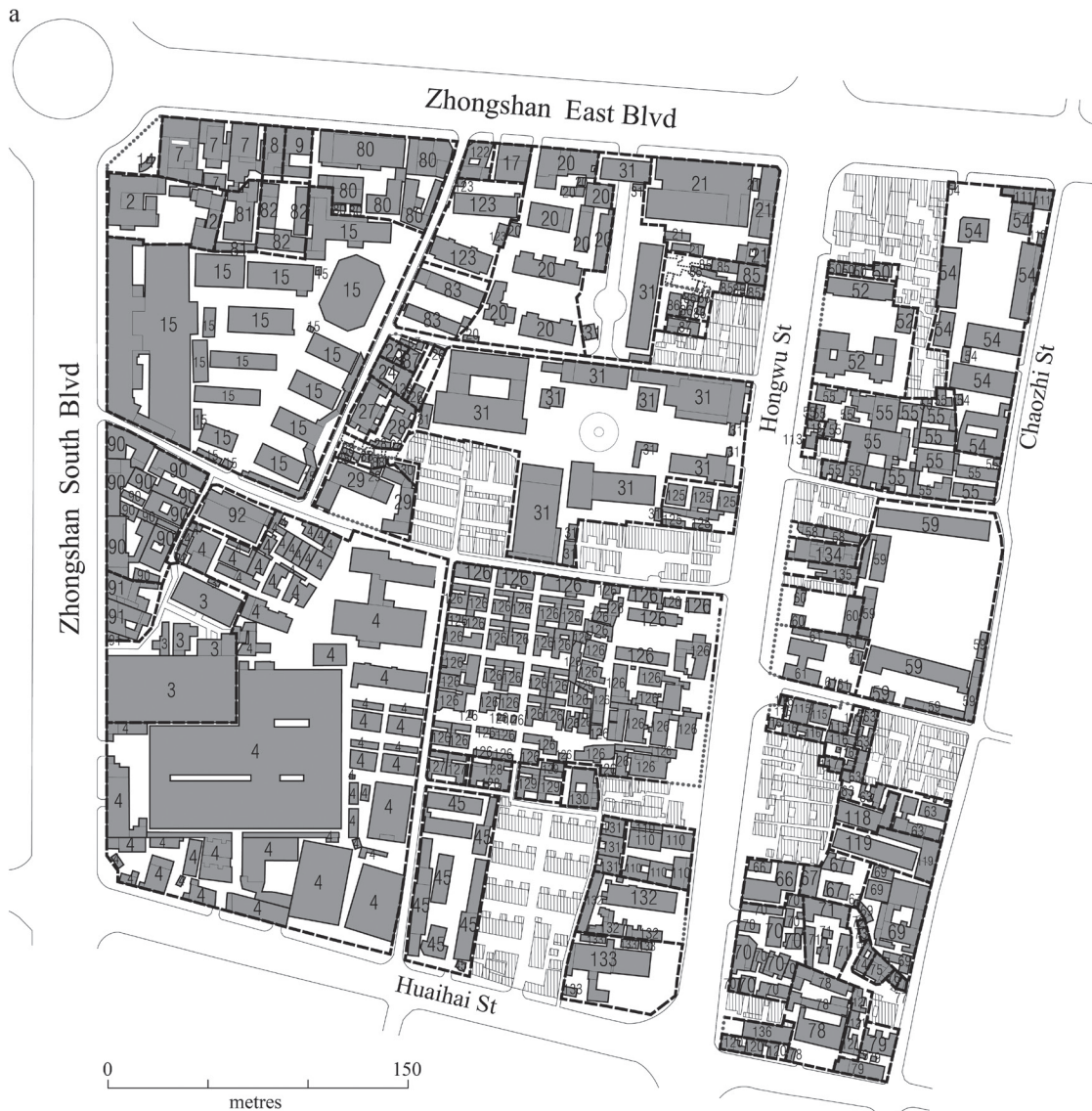
Figure 12 shows the number of plots over time that were metamorphosed and not metamorphosed. In each period, less than half of plots metamorphosed and the proportion metamorphosed peaked in 1953–77 (42 per cent). The generation and development of danweis was the main engine of these changes (Figure 13). But it is evident that other factors in the economy could also trigger plot metamorphosis. For example, the nine cases that occurred without the generation of danweis during the period 1978–88 were all caused by a road-widening project.

Figure 14 shows the extent to which the development of danweis was related to their building boundaries. There were 59 danwei creations in accord with existing boundaries in 1949–52, 39 in 1953–77, and 12 in 1978–88. In the case of existing danwei developments, 3 were in accord with previous building boundaries in 1949–52, 28 in 1953–77; and 22 in 1978–88. Thus the very large majority of danwei-oriented plot metamorphoses occurred in accord with existing building boundaries (62 (95 per cent) in 1949–52, 67 (97 per cent) in 1953–77, and 34 (83 per cent) in 1978–88). The development of danweis in the planned economy was strongly related to existing building locations. Thereafter, as the market system became increasingly prominent, the development of danweis gradually lost momentum.

Patterns on the ground

Land utilization

In the policy of free land allocation, the utilization of construction units was determined by the functional attributes of the danweis. For instance, changes in the pattern of minor roads in one case reflected the fact that a group of residential buildings had been reallocated as state-owned properties to several danweis (Figure 15). The new land-use pattern



..... Unit boundaries do not follow original building boundaries
 - - - - Unit boundaries follow original building boundaries

■ Buildings allocated to work units
 ▨ Folk houses or residential buildings

The major work units: 2. Bank; 3. Dahua Theatre; 4. Zhongyang Department Store; 7. Bank; 15. Xinbai Department Store; 20. The Xinhua News Agency Jiangsu Branch; 21. Xinhua Bookstore; 29. East China Ministry of Industry, Nanjing Office; 31. Workers' Cultural Palace; 45. Electrical equipment factory; 50. Dormitory units of Nanjing Federation of Trade Unions; 54. Enterprise Bureau of Logistics Department of Nanjing Military Region Command; 59. The No. 15 Middle School; 66. Auto accessories manufactory; 79. Foreign Economic Relations & Trade Commission, Nanjing Office; 126. Store for sole traders.



Figure 10. Danweis growing or shrinking by obtaining the use rights of buildings in 1977–88, thereby shaping the plot pattern in 1988: (a) buildings occupied by danweis; (b) plot pattern in 1988.



Figure 11. The process of plot metamorphosis in relation to building type: (a) plot subdivision 1949–1952; (b) plot amalgamation 1949–1952.

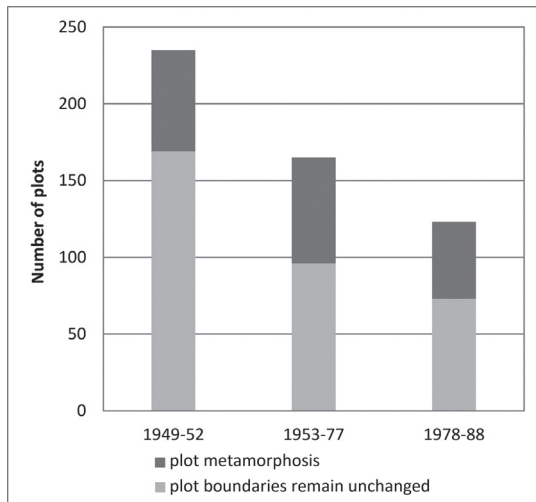


Figure 12. Incidence of plot metamorphosis.

was achieved by assigning new functions to existing buildings, resulting in changed plot patterns, but the outward physical form was maintained.

Alteration to plot shapes

In many cases, danwei development induced plot boundary adjustments. The development of the Workers' Cultural Palace is an example. By 1952, the danweis of the Xinhua News Agency Jiangsu Branch and the Workers' Cultural Palace had already been formed, and there was a fairly straight boundary between them. Between 1952 and 1977, the northern end of the palace was enlarged from 15 to 27 m to create an official entrance for vehicle access on to the Zhongshan East Blvd. Thus, the plot boundary between these two danweis changed. For political purposes, the palace was further developed between 1978 and 1988, and a rectangular building was constructed at its north entrance. Accordingly, the boundary between these two danweis was altered again (Figure 16).

Changes to street lines

Owing to the development of the Workers' Cultural Palace, the related branch road

system was changed. At the beginning of New China, the palace was inserted into this central city area as a symbol denoting the improvement in social status of the workers. Its major occupation of vacant land expressed the ambition of its senior authority, the Nanjing Culture Commission. With the approval of the Nanjing Municipal Construction Commission in 1977, the extent of the palace expanded to approximately 13 700 m², covering even the original branch road serving the neighbouring residential units. At its peak, the project included a cinema, a coliseum, two bookstores, a Science and Education Building, and an exceptionally large outdoor space. However, in the 1980s, the increase in commercial and service functions inside and around the site required a more efficient transport system and led to the reopening of the original branch road (Figure 17).

Shaping the large plot

In the planned economy period, the motivation for plot transformation was particularly the space requirements of the danweis. In particular, the construction of department stores and cinemas was in many cities supported by government financing in the early years of New China. Accordingly, some danweis with very large sites and complex functional systems were formed. The shaping process of the Xinbai Department Store was characteristic. The site of the danwei of this store was enlarged in 1954 and 1957 (Figure 18). Business hall extensions, warehouses, and affiliated staff quarters were constructed. However, as with other danweis, the function of the store was much more complicated than just facilitating commercial transactions. It acted as a type of social organization; both working and living spaces were arranged within the same plot. As a result, its plot size before 1988 was as much as 15 000 m². In this area, the average size of commercial plots was 7000 m² in the subsequent socialist market economy period.



Figure 13. Plot metamorphoses caused by or irrelevant to danwei development.

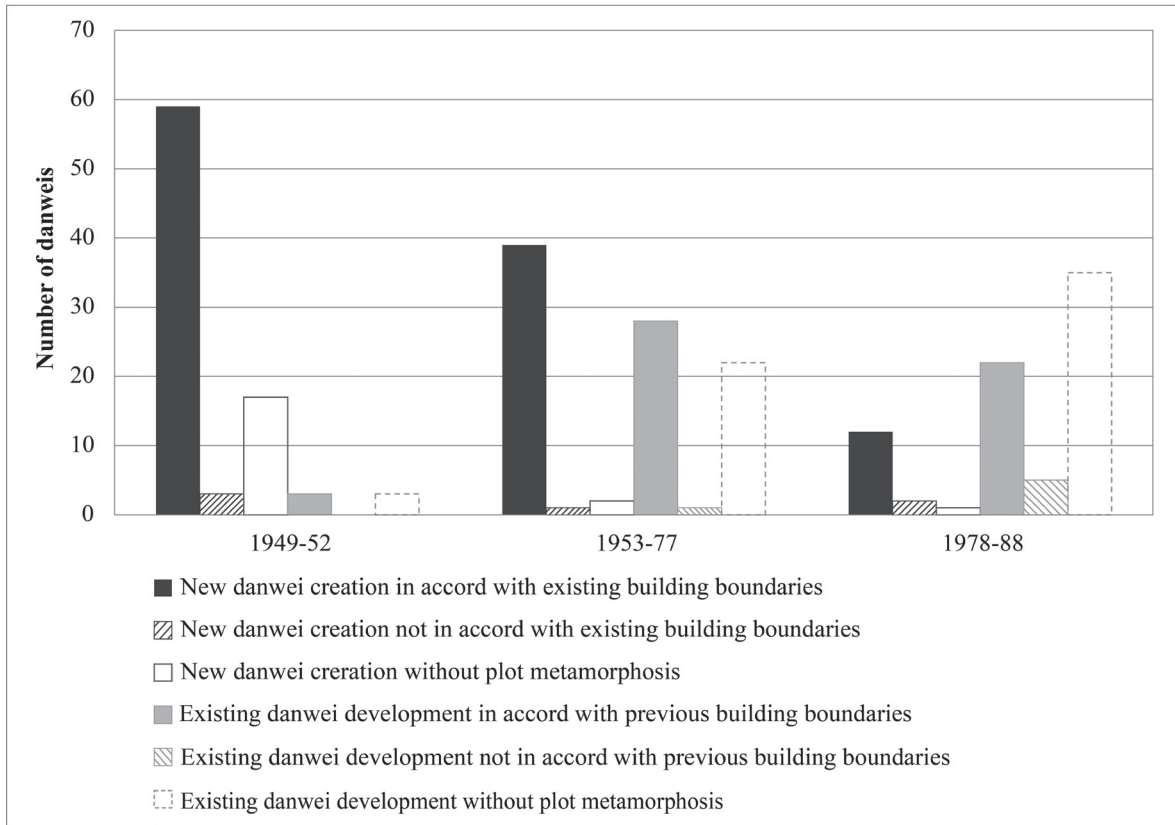
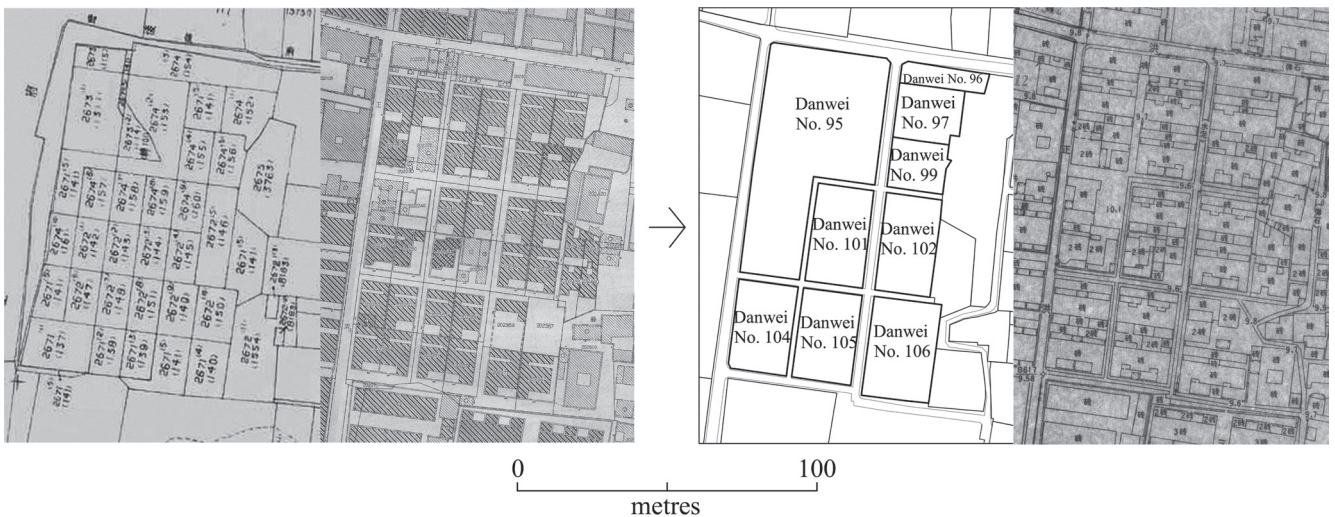


Figure 14. Danwei development in relation to building boundaries.



a. Plot pattern in about 1949 (sources: cadastral plan 1936; cadastral plan and land-use map, 1952)

b. Plot metamorphosis by danwei in the 1970s (source: construction document, 1974)

Figure 15. Plot patterns transformed but original buildings retained, and land utilization determined by character of danweis.

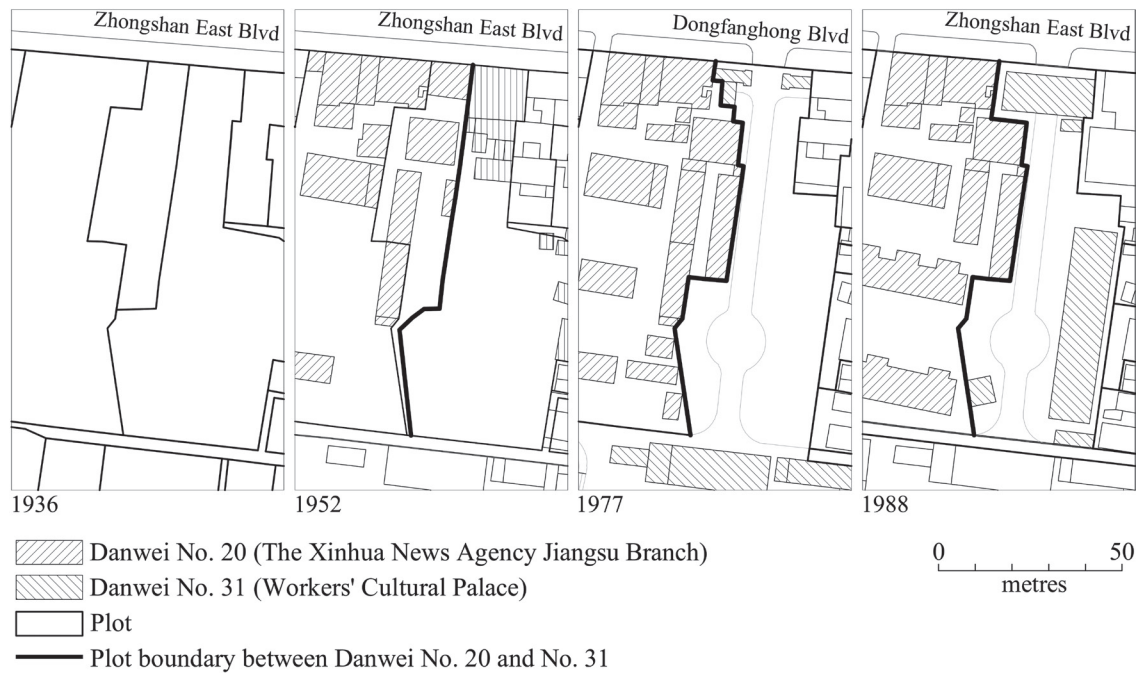


Figure 16. Changes of plot shapes.

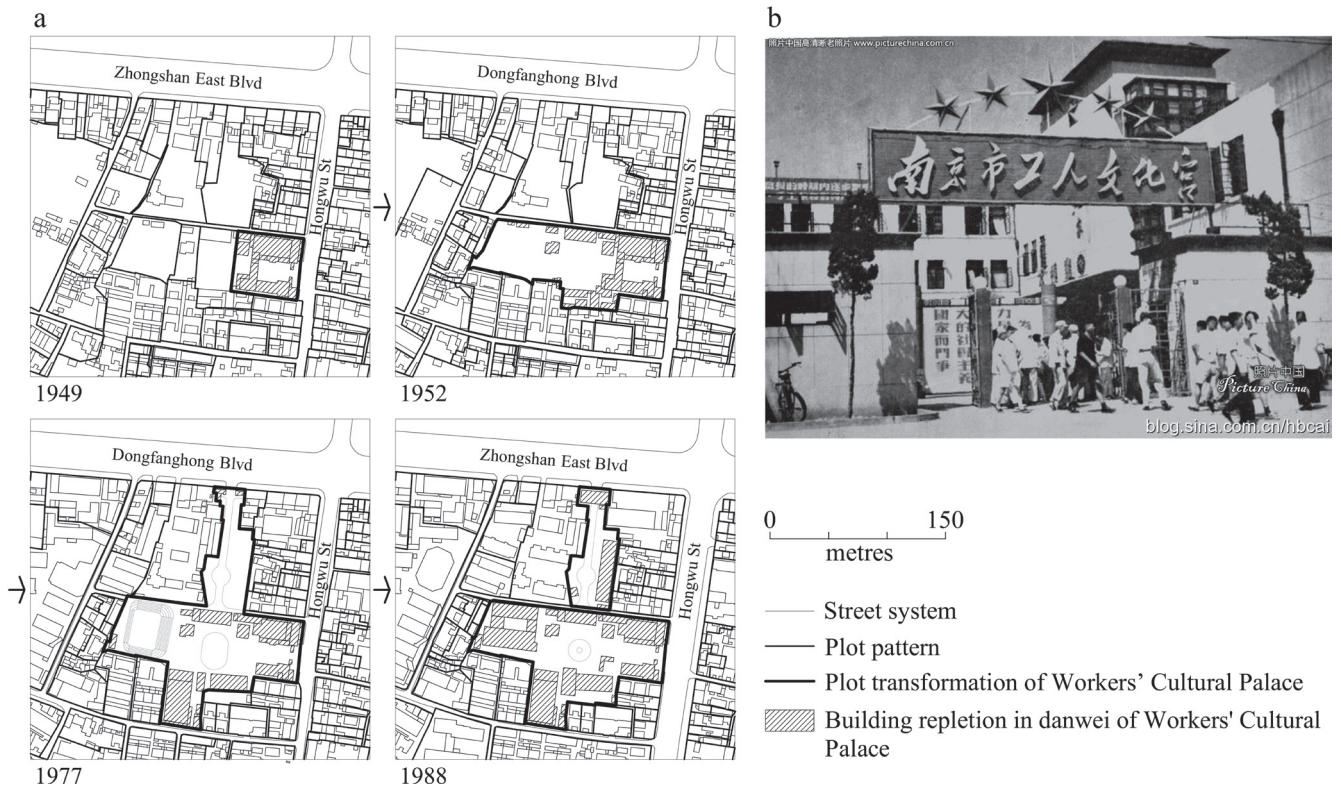


Figure 17. The danwei development of the Workers' Cultural Palace blocking the original branch road: (a) plot metamorphosis (source: NUCA); (b) Workers' Cultural Palace in the 1970s (source: www.picturechina.com.cn).

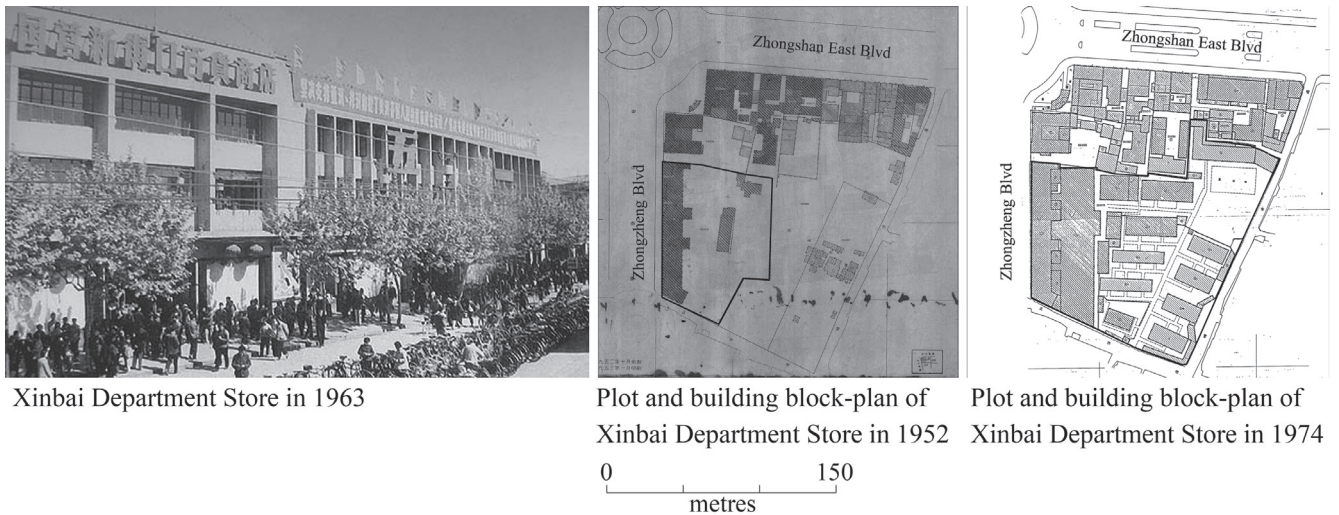


Figure 18. Large plot size shaped by the danwei development of Xinhai Department Store.

Conclusion

Three results of the research warrant emphasis. First, the 'plot' remained a fundamental element in the process of morphological change under the planned economy. However, the process of Chinese urban development, particularly in this period, followed a different path from that of Western countries. The transformation of urban form was restricted by top-down economic policies in which the land market did not have the same function as in a market economy system. In the planned economy, the policy of free land allocation affected the urban pattern and led to specific urban forms. Nevertheless, methods of investigation similar to those used in Western countries can be employed. Based on the series of plot maps, the relationship between land management policies and urban form can be traced. This research has affirmed that urban form can be studied most effectively in different types of cities, regardless of political economy and social system. Conzen's theories on morphological elements remain a strong apparatus for investigation. Among the elements emphasized in his work, the 'plot' has been shown in the present research to have a particularly important role despite the marked difference between the economic system studied here and that pertaining in Western

countries studied previously by Conzen and many others.

Secondly, the research has revealed that the plot has special meaning, characteristics and purpose in Chinese urban development in the planned economy. The plot reflects the physical extent of the social institution of the danwei rather than the ownership of property because all plots were state-owned land and had nothing to do with capital. A larger plot did not mean more capital possession, and plot amalgamation did not imply the accumulation or centralization of capital. A strong link between plot location, size and shape and the function of danweis and other urban requirements was not evident. For instance, many government institutions occupying profitable locations along the main streets of the city had blank walls, and land utilization along the shopping street was not only for business but included the living accommodation of employees. In this system, the expansion or contraction of plots was not necessarily in the best interests of urban development but tended to match the internal requirements of each danwei. Instead of being a land unit described by its market value, a plot only had value in use as an asset accommodating buildings and activities.

Thirdly, buildings played an important role in the process of formation of the current plot

pattern. In the period of the planned economy, danweis were created by local government, and the process of plot metamorphosis was heavily dependent on building allocation. The danweis acquired buildings as state-owned property. Their plots were outlined according to the location of buildings. In this sense, the nature of the danweis dictated the functions of the buildings and the properties of the land. In contrast to the general principle that the plot restricts building construction, the spread of buildings belonging to the same land users strongly influenced the shape and dimension of plots. That is, the plots were the passive result of danwei development under governmental guidance. Therefore, many irregularly-shaped plots were produced. This Chinese case demonstrates how plot patterns were transformed by the updated building patterns. Plots had no economic exchange value. Buildings had value based on their utilization. Plot expansion or contraction reflected this in the acquisition or loss of buildings.

Although this study is essentially an investigation of ground plan, the sound bases of the historical-morphological investigation are an important step towards understanding urban form in relation to socio-economic and political factors, particularly in Chinese cities. The process of fragmented land allocation facilitates understanding of the complicated plot dimensions and other plot characteristics in modern Chinese cities. In this sense, the planned economy period is critical in the transformation of modern Chinese cities. The research has demonstrated that cartographic sources under different types of socio-economic system warrant painstaking investigation. As Conzen himself argued, careful examination followed by regionalization is not only fundamental to understanding inherited urban form but also provides a sound basis for appropriate strategies to improve the urban landscape.

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