Modernity of Chinese Urban Neighborhoods
-- Toward New Spatial Forms

by

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Submitted to the Department of Architecture
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Master of Science in Architecture Studies

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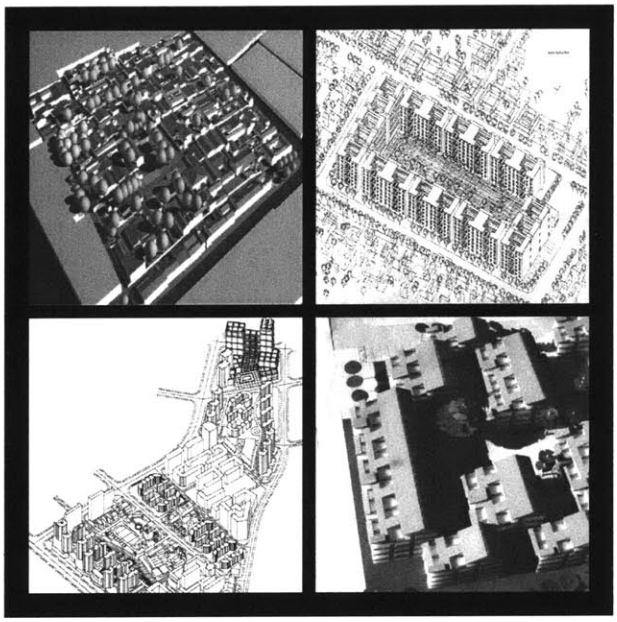

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MODERNITY OF CHINESE URBAN NEIGHBORHOODS -- TOWARD NEW SPATIAL FORMS

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ABSTRACT

There is always a general dilemma about how to balance technology and humanity in urban neighborhood development. Modern technology creates many new spatial forms for Chinese urban neighborhoods, but it also destroys many traditional fundamental characteristics. Because of lacking systemic analysis tools, ignoring ecologically sustainable development and mechanically copying some models from the West, many Chinese urban neighborhoods completely have lost their traditional characteristics. This has been a common phenomenon in contemporary China from 1840. Through reviewing current social-economic environment in China, studying advanced foreign methods of modern urban neighborhood development, and searching solutions from native practices, this thesis attempts to identify the problems met by Chinese contemporary urban neighborhood development, explore research on new spatial forms which fit modern Chinese urban neighborhoods, and set up some possible design strategies.

Thesis Supervisor: Michael Dennis

Title: Professor of Architecture

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CHAPTER 1: HISTORIC REVIEW OF CHINESE URBAN NEIGHBORHOODS

1. Prototype of Chinese Urban Neighborhoods

China

China is one of the largest countries in the world with a long history. The majority of the Chinese live in the east and south of the country where intensive agriculture supports most of one fourth of the world's population. The west and east of China, mainly mountains and desert, have far less density of population (Figure 1-01).

Figure 1-01: The map of China
(Source: *Housing in Beijng*)

Since 1978, as the largest developing country in the world, China has been attempting to transfer her old economic system to a mixed system that contains both the marketing economic system and the schedule-economic system. The Chinese called this transition "reform." From the beginning of the 1990's, because of the high speed of economic development -- the annual growth rate of eight percent is believed to be sustainable from 1980 to 2010 -- the real estate market has become hotter and hotter. The urgent demand for improved infrastructures, increased living space and open space, has sped up the urbanization process.

The Fangli (Fangxiang) System

A traditional Chinese neighborhood was a microcosm of traditional Chinese society. It represented all aspects of the society in both practical and spiritual terms -- its organization, economy, technology, traditions and beliefs -- in short, its culture. This culture is our living heritage, alive in the entire history of urban neighborhood development. Although local environmental and social conditions create regional diversity, Chinese neighborhoods generally share the same core spatial concepts, layouts

and structures. From north to south, from ancient times up to the recent past, traditional Chinese urban neighborhoods have nearly always been formed by a courtyard surrounded by buildings and buildings aligned along streets.

The earliest existing model of city form is Gaojing, the capital of the Zhou dynasty (1027 BC-256 BC, Figure 1-02). This earliest city model presented a strictly hierarchical system with obvious political purposes and maintained its basic form in all Chinese cities until the end of the 19th century (Figure 1-03). In this model, there was

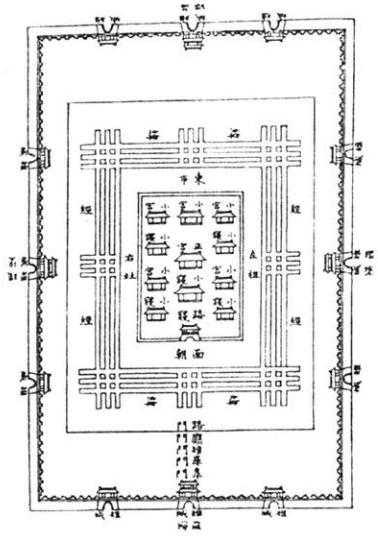
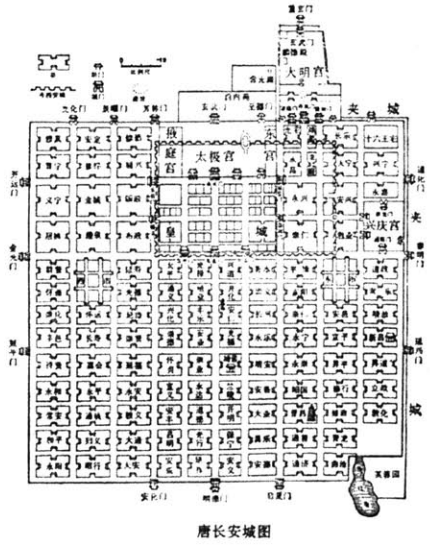


图 9 周王城图

Figure 1-02: Gaojing plan
(Source: Ministry of Construction, China)



唐长安城图

Figure 1-03: Xi'an city
(Source: Ministry of Construction, China)

always a wall to defend the city; in the inner city, main roads connected to the gates of the wall with sub-streets connecting to main roads; blocks were surrounded by these sub-streets; mixed with municipal and commercial buildings and workshops, courtyard housing filled the blocks and became the basic unit of the urban neighborhood. In this hierarchical system, the emperor, nobles, and civilians constructed their buildings under unified rules, which restricted construction activities by controlling street widths, district scale, and building forms (Figure 1-04).

Figure 1-04: Conceptual structure of city
(Source: *Housing in Beijng*)

As the prototype of the Chinese ancient neighborhood form, the Fangli (or Fangxiang) system was initiated in the Qin dynasty (256BC). The fish-bonelike transportation network was the basic structure of a Fangli system, in which smaller transverse streets that led to even smaller dead-end alleys joined together. These streets and alleys defined the boundaries of every block and several blocks combined into a neighborhood (Figure 1-05). The Fangli system changed little until the end of the 19th century when it faced challenges of the industrial revolution.

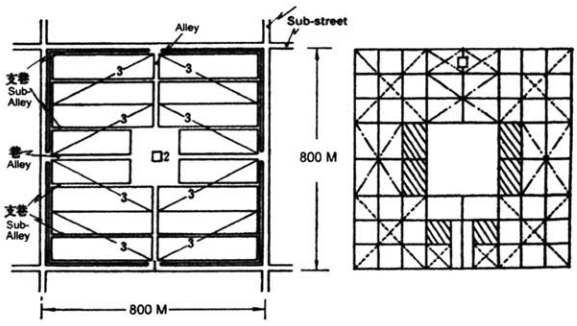


Figure 1-05: Fangli system
(Source: *Rehabilitating the old city of Beijing*)

In a typical Fangli system, dwellings -- courtyard houses normally, were structured to shape family organization and to weave the web of social and ethical norms that linked the household to the street or alley outside. Hierarchies of generation, age and gender together gave rise to divisions of interior domestic space that demarcated significant relationships in spatial terms that finally construct the frames of the cities and the society. A Fangli unit could be seen as an inculcating "text" or "template," richer in texture and meaning than simply a structure of the city form with a specific plan (Figure 1-06).

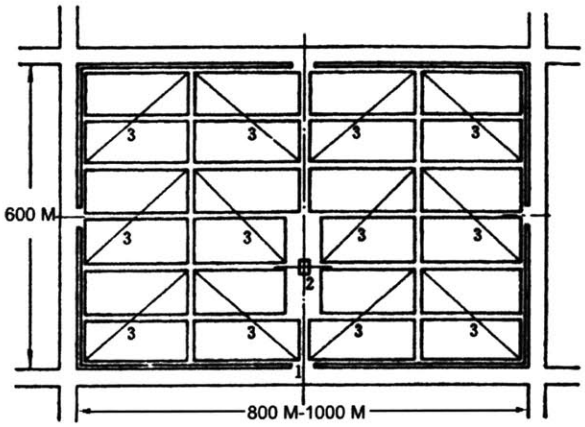


Figure 1-06: A typical Fangli neighborhood
(Source: *Rehabilitating the old city of Beijing*)

Courtyard and Street

There were two kinds of open spatial elements in a typical Chinese neighborhood -- courtyard and street. Whatever the location and time, the courtyard (*Yuanluo* or *Tianjin*) was at the center of the house. The number and size of courtyards might vary according to the wealth of the owner and regional style, but the courtyard was always a

place where a household's inhabitants could make contact with nature and observe the changes in seasons and climatic conditions, a playground where children could play games, and a space where people from the same big family could communicate with each other. One of the reasons why Chinese cities did not develop squares could perhaps be the provision of courtyards within each house unit. The courtyard is not only the basic unit of neighborhoods, but also the basic unit of the whole traditional Chinese society (figure 1-07).

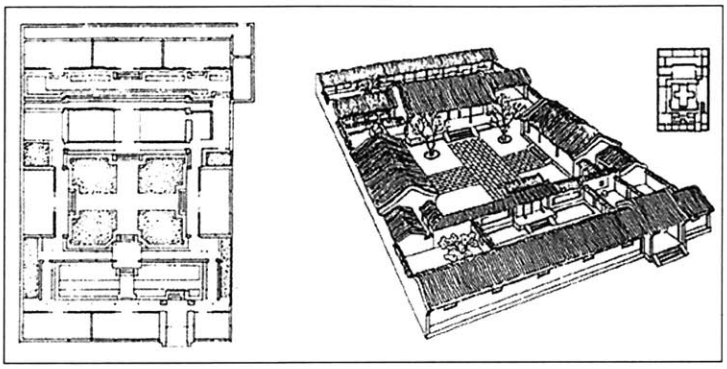


Figure 1-07: A typical courtyard housing in Beijing

As the other basic element in traditional Chinese urban neighborhood, streets not only functioned as transportation pathway, but also a daily communication place. Without squares in most old cities, streets were burdened with more commercial, religious and ceremonial functions, and represented abundant spatial forms and contents, In most modern transportation theories, a street should distribute traffic flow as quickly as possible, but for many streets in ancient China, slow was not bad sometimes -- the street was used to balance the mixed-use functions of transportation and communication, and mixed-use was a basic character of the Fangli system (Figure 1-08).

Figure 1-08: Lijiang city, 1999
(Source: Ministry of Construction, China)

Dwelling

For 3000 years, a house has always been seen as a living symbol. "It is the focus of the aspirations -- social and spiritual -- of the people who made it. It shelters the family and it is here in courts of prescribed proportions, shaded by walls of prescribed heights,

in its chambers for social intercourse, in its chambers for religious mediation and ceremony and in its private chambers..."[1]

Traditional Chinese dwellings come in many forms, some relatively small and simple, others elaborate and complex. Simple three-roomed rectangular houses reflecting the poverty of peasant life have always been common in China, while ramified residential complexes with multiple courtyards and many generations of a family living within are by comparison somewhat rare. Differences in family size and resources over time created a dynamic quality in individual social units, which in turn, means that no Chinese dwelling is static or fixed in form. Rather, each dwelling mutates to accommodate changing family circumstances (Figure 1-09).

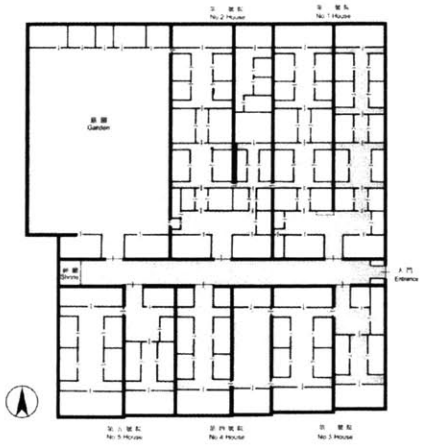


Figure 1-09: Multiple courtyard housing (Source: *Living heritage- vernacular environment in China*)

It is not really possible to summarize a "typical" Chinese house form or set of family customs since these vary over time and space. However, we can ascertain common characteristics of Chinese dwellings, such as inward looking, symmetrically balanced, hierarchically organized, and ritually entered. Orientation to the cardinal directions, axiality, symmetry and balance guided the layout of dwellings throughout China in the past and, indeed, are still important principles in the design of new homes (Figure 1-10). In residential complexes, buildings were arranged either on an east-west or a north-south axis, creating a pattern of layered horizontal and vertical structures around courtyards. Private spaces for ritual were

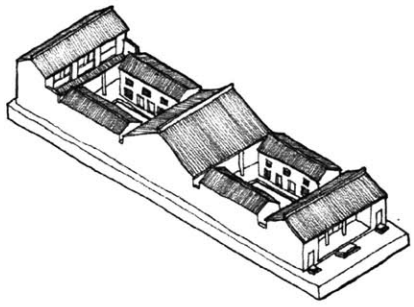


Figure 1-10: Courtyard housing (Source: *Living heritage- vernacular environment in China*)

[1] Zhu, Qiqian. Remarks at the convening of the Society for Research in Chinese Architecture, *Bulletin of the Society for Research in Chinese Architecture*, 1(1) 1930: pp. 1-2.

usually found in the innermost horizontal structures, public spaces in the middle-ground horizontal structures (i.e., the main hall or *Tingtang*), while vertical wing structures (i.e., the side chamber or *Xiangfang*) served lesser purposes. In well-developed Chinese dwellings, the senior generation resided in the innermost south facing structure, which usually also contained the main ritual hall with an ancestral altar. Within the cellular form of these complex dwellings and even in simple three-bay rectangular houses, the spatial associations of "inner" and "outer," above and below, front and back and distance from the center not only reflected but also helped regulate family relationships.

2. Chinese Urban Neighborhood Development from 1840 to 2000

1840-1949

In Europe and the U.S.A., there were three important factors that deeply influenced modern neighborhood development during this period. (a) In the Garden City movement, principles in urban planning began to focus on high environmental quality (figure 1-11). (b) Building regulations were modified to fit modern city planning theory, including the regulations on the minimum size, layout, and dimensions of dwellings, adequate supply of light and air, safety issues, as well as structural adequacy and sanitation. (c) Many new building societies and associations accelerated the speed of modernizing cities. For city planners and architects, concern about fundamental spatial circumstances, such as planes, lines, volumes, surface, and coloration (Figure 1-12), became prime. It was the time that the second industrial revolution and World Wars helped Western countries to set up truly enlightened, democratic and modern societies.

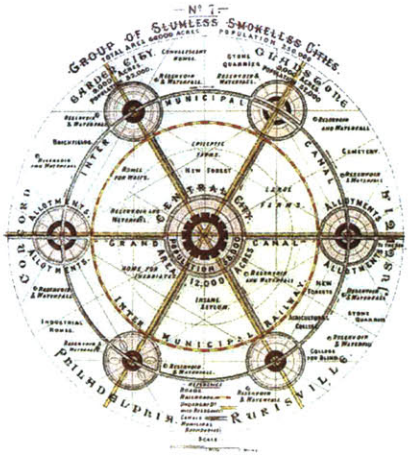


Figure 1-11: Garden city
(Source: *Modern housing 2*)

Figure 1-12: Ludvig Hiberseimer: Project for a city, 1926-1928
(Source: *Block housing- a contemporary perspective*)

The period from 1840-1949 was an important era in Chinese history. This was a time when China moved gradually and painfully from a feudal society into a semi-feudal and semi-colonial society. During this period, based on traditional culture, drastic political, economic and social transformation undertook many urban neighborhood developments, which first appeared in the modern sense. As improvements were made to meet new requirements, traditional urban districts became incorporated into what became modernized urban neighborhoods (Figure 1-13). They gradually grew out of traditional forms and evolved into new, diversified forms with distinctive Chinese elements. Closed courtyard houses suitable for large traditional families were replaced by smaller but open housing suitable for the modern, small-sized families. Streets were broadened and simple modern infrastructure systems were built (Figure 1-14). Considerable progress was made in building technology. In these one hundred years, these developments started from initial formation and then going through prosperous times followed by decline. Although Chinese planners and architects tried their best to regenerate their country, two wars against the Western colonial countries, three civil wars and two world wars brought horrible disaster and plague to China, pushing the country to the edge of collapse.

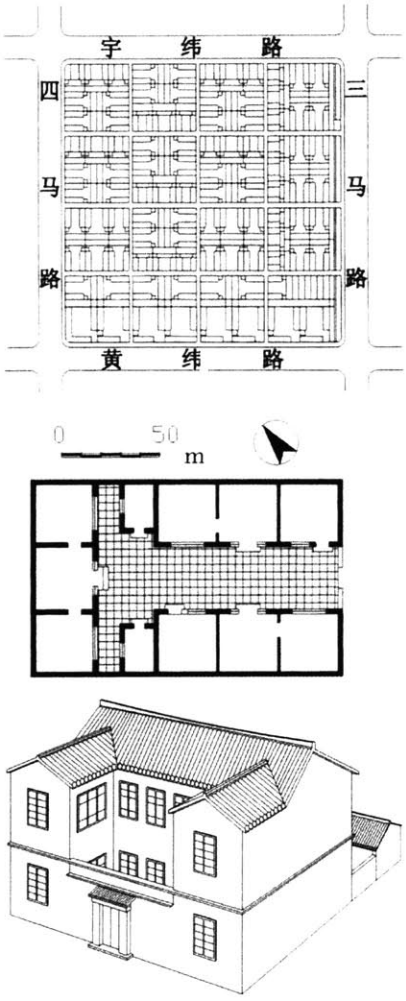


Figure 1-13: A typical new courtyard housing in north china, 1930s
(Source: *Modern urban housing in China 1840-2000*)

Figure 1-14: New urban neighborhood in north china, 1930s
(Source: *Modern urban housing in China 1840-2000*)

1949-1978

After World War II, European countries and the U.S.A were experiencing a housing boom accompanied by a great reconstruction movement. Modern theories of city forms s were developed without interruption from the 1920s to the 1930. However, high-rise residential towers and slab blocks began to dominate city landscapes (Figure 1-15), when the idea of being able to devise and build large and complex urban projects was advanced. By the 1970s, people suddenly found that the environment they were familiar with no longer existed. The development methods were changed dramatically after people rethought what the urban renewal movement had brought (Figure 1-16). The large-scale plans and neighborhood projects proved too crude and inflexible.

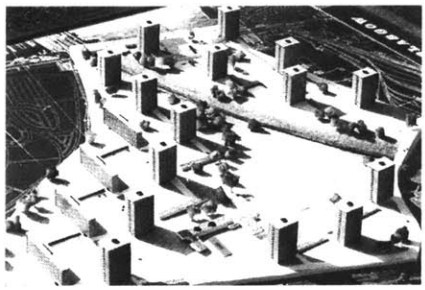


Figure 1-15: Glasgow: Sighthill development, 1963-1969
(Source: *Tower Block*)

Figure 1-16: Le Mirail: Toulouse house, France, 1962
(Source: *Multistory Housing*)

Meanwhile, in China, accompanied by new socialist regulations, accelerating development and quickly increasing population, new neighborhoods and planning concepts were developed. Moreover, they were different from traditional Chinese urban neighborhoods in almost all aspects, including investment and construction methods, layout, architectural forms, structure and technology. Under the socialist planned economy, based on the experiences of the Soviet Union, China first developed a complicated urban housing welfare system. This system divided urban residents into different categories and imposed control over them. As a result, people whose work units were of a different ownership, implying a different social status, were living in different housing conditions. With this system, two types of neighborhood also appeared in cities: the neighborhood managed by enterprises or institutions, and publicly owned neighborhoods managed by urban housing management departments of local governments. During this period, modern planning concepts of the residential cluster were introduced. New urban neighborhood plans were characterized by an emphasis on slab blocks, formal street patterns around enormous public squares, interspersed with

grandiose public buildings and monuments (Figure 1-17). Many historic sites and historically significant landmarks disappeared due to new construction. Although the development speeds varied according to the particular economic and political imperative, demolition and reconstruction were always unceasing (figure 1-18).

Figure 1-17: Site plan of Chaoyang neighborhood in Shanghai, 1951 (Source: *Modern urban housing in China 1840-2000*)

Figure 1-18: Urban neighborhood, Beijing, 1960s-1970s (Source: Ministry of Construction, China)

The Cultural Revolution (1967-1976) ended the high speed of reconstruction with the state policy of "production first and livelihood second", but the destruction of old buildings didn't stop. Architects and urban planners could not do what they thought right and were not permitted to learn new ideas and technology from the West. Although development turned out for the best during the later period of the Cultural Revolution, the influence lasted until 1978. A crumbling economic situation, a virtual standstill in housing development and a swelling population created extremely serious housing shortages, and reform became inevitable.

1978-2000

From the end of 1970's, the scale of neighborhood redevelopment projects decreased and was particularized in Europe and the U.S.A. Traditional contexts and natural environmental issues became more important in urban renewal, so that master plans focused more than ever on ecological and social issues. Local communities and residents took part in the designs and maintenances, and sometimes became the main control powers. A return to historicism and rationalism also occurred. Some concepts of early modern architecture were abandoned while some others of modernity were developed (Figure 1-19). Sustainable development and the New Urbanism movement created many new spatial forms of urban neighborhoods, which wholly represented the respect of humanity, nature and technology (figure 1-20).

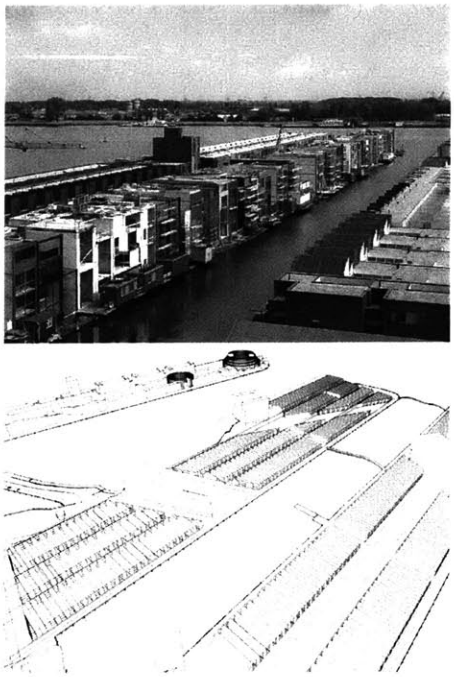


Figure 1-19: Steven Hall: Borneo Sporenburg development, Netherlands (Source: *Modern housing 2*)

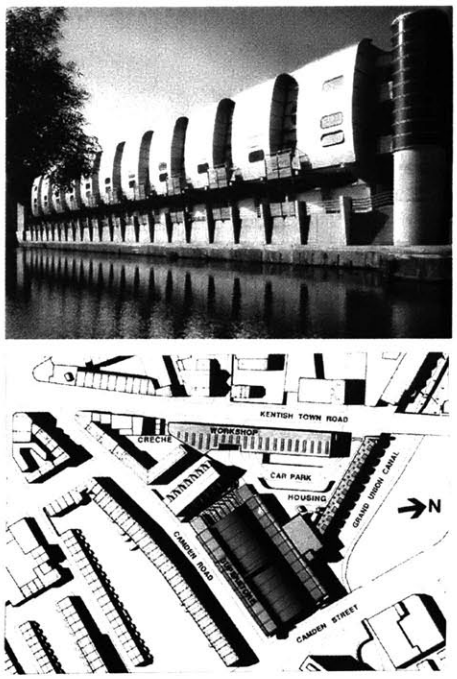


Figure 1-20: Nicholas Grimshaw: Grand Union Walk, London, 1986-1988 (Source: *Block housing- a contemporary perspective*)

In China, with reform and opening-up, actions, regulations and associations were reset and rebuilt. Over the last twenty years, new neighborhood development completed the transition from a welfare housing system to a socialized housing security system. Neighborhood development made unprecedented progress, both qualitatively and quantitatively, and modernization of the housing industry became the general goal of China's neighborhood development. A range of facilities including health, social, commercial, educational, recreation and sports, has been added to urban neighborhoods (Figure 1-21). Apartment size has increased, with water and electricity, sewage, gas, heating and ventilation systems, kitchens, and baths. More important, the establishment of the theory of a socialist market economy has accelerated the commercialization of housing, and promoted research on improving the living environment and diversify in spatial types. In particular, active theoretical explorations and practices on modern urban neighborhoods have greatly helped raise the overall standard of living environment and increased emphasis on rehabilitation of traditional spatial forms (Figure 1-22).

Figure 1-21: Hongmeixincun neighborhood, Changzhou, Jiangsu Province, 1980s
(Source: *Modern urban housing in China 1840-2000*)

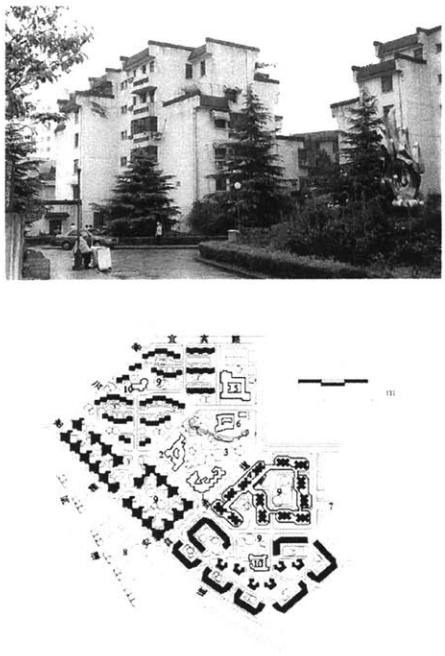


Figure 1-22: Qinyuanxincun neighborhood, Wuxi, Jiangsu Province, 1990s
(Source: *Modern urban housing in China 1840-2000*)

3. Modernity

Traditional evolution principles had emphasized keeping the spatial characteristics of urban neighborhoods continuous. However, from the beginning of the 20th century, the birth of industrial civilization created discontinuity. Modernity broke the continuous process of neighborhood development. Furthermore, the significant changes that came from three industrial revolutions even gave modernity itself some discontinuity characteristics.

For China, the transition from an agricultural society to an industrial society took no more than 100 years, which is very few for a country with 5,000 years of history. This transition was so fast that old urban spatial forms were often completely destroyed. There is a serious problem unsolved, which is how to achieve balance between the requirements of modern life and traditional culture. Even though modern technology has created so many new spatial forms, it also has harmed the basic fabric of urban neighborhoods. Now, in a typical Chinese urban neighborhood development project, officers, developers, and residents all desire an active commercial environment, large living spaces, and

international building style. At the same time, with more and more residents migrating into cities from villages, the standards for a new urban neighborhood are very low sometimes. The designs can be finished in a few days, and then the buildings can be constructed very quickly. People have to accept high-rise towers, big-scale blocks, and huge freeways as the inevitable results of modern life. A common phenomenon in contemporary China, especially in the last twenty years, is that modern Chinese urban neighborhoods, whether simple or complex, all too often appear relatively barren and detached from the broader social context in which they are located.

Another example is transportation. Without careful planning, a transition from old street systems, which mainly served for the pedestrian traffic, to modern automobile transportation systems, was very quick and impetuous. The practices of mechanically copying transportation models from the West, lacking advanced systemic analysis tools, and ignoring ecologically sustainable development have broken the organic connection among each part of the city. As a result, people have to spend two or more hours on the road every day in crowded public transportation vehicles.

It is time for the Chinese to rethink and explore new spatial forms of their urban neighborhoods. The modernity of Chinese urban neighborhoods should represent not just a negative aspect of discontinuity, but should represent some positive impacts, such as sustainability and humanity. Only some comprehensive and in-depth research can tell us how to find a balance between the requirements of modern life and traditional culture.

The relationship between modernity and modern urban neighborhoods has been extensively studied in the last fifty years. Especially in developed countries, many successful methods are generated to solve conflicts between modern lives and neighborhood redevelopment; traditional contexts and environmental issues are being considered more than ever; local communities and residents actively participate in design processes; and designers use their understanding of new spatial forms to design and represent the respect of humanity. However, there are different social, cultural, economic, and political conditions between China and western countries, the characteristics of neighborhood redevelopments should be different from each other. Therefore, certain simplifying assumptions that copy some models from the West are called into question. For researchers who want to explore urban neighborhood development in China further,

it is necessary to review the current social-economic environment in China, summarize general trends, assimilate advanced foreign methods, and find solutions from native practices.

CHAPTER 2: OPPORTUNITIES AND PROBLEMS IN CONTEMPORARY CHINA

Man-made settlement patterns are the physical foundation of our society. They are becoming more and more fractured. Modern development strategies and zoning laws segregate age groups, income groups, ethnic groups, and family types. They isolate people and activities in an inefficient network of congestion and pollution, rather than joining them in diverse and human-scaled communities. We threaten traditional social and cultural environments and they are threatening us in return. It is critical that we learn to understand the qualities of our living environments, expressing them in urban planning and building design, integrating them within local communities and government, and finding the balance between economy, culture, and physical environment.

1. When China Faces Urbanization . . .

Urban neighborhood development reflects social progress and economic growth, as well as changes and contradictions caused by the redistribution of social interests during the period of reform and opening-up in China.

Migration Flow

China, with the largest population in the world, is a major agricultural country. Despite the existence of capital cities with populations of one million or more, urbanization was at an extremely low level of around 6% in the late nineteenth century and 11.2% by 1949. Furthermore, the economic system and rigorous household registration system in communist China resulted in sharply contrasting housing layouts in urban and rural areas. In the thirty years from 1949 to 1978, little progress was made in urbanization, which kept lingering at 17-18%. The reform and opening-up policies initiated in the 1980s accelerated the process of urbanization, which rose to 29.7% in 1998, and it is predicted that by 2030, China's total population will reach 1,600 million and the level of urbanization will increase to 55%. By then, China's urban population will amount to 880 million people, more than double the present 370 million. A very small number of the increased urban population will come from natural growth (less than 0.3%), while most of them will emigrate from rural areas. Consequently, as urbanization

speeds up, the urban population expansion will impose great pressure on urban neighborhood development (Figure 2-01).

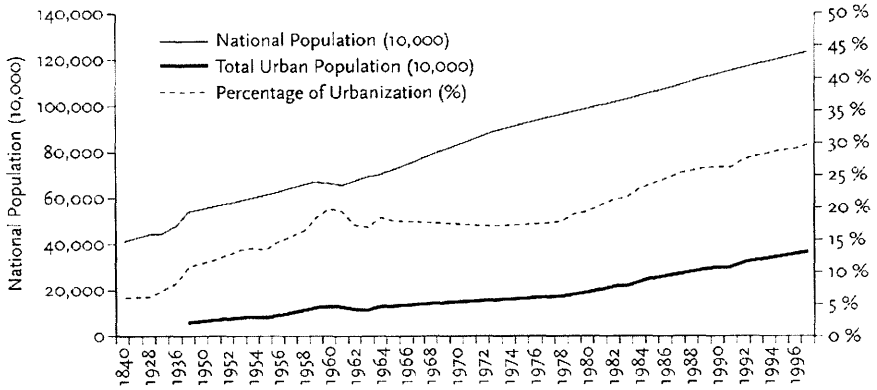


Figure 2-01: Population changes urbanization in China
(Source: *Yearbook of Chinese population statistics, 1998, & Modern urban housing in China 1840-2000*)

Housing Shortage

Many survey results show a very negative resident perception of city interest and investment in old urban neighborhoods if there is not an obvious profit return. Homeowners feel that city governments have not maintained streets and parks well, that the police do not patrol commercial areas, and that the areas lack amenities that have been provided in other neighborhoods. They also complain about excessive noise from trucks, abandoned service stations becoming eyesores, and the litter and trash along the streets. In a recent survey[2] in East China, 50% of residents stated they would move if they could sell their houses; 70% stated that the city does not fulfill its commitments; and 60% stated that they would not commit the funds to maintain their homes as they had in the past. A poor physical environment is the biggest barrier to conserving traditional neighborhoods and securing investment to redevelop them.

Compared with 4.4 square meters in 1985, in 1996 the per-capita living area of urban residents had reached 8.4 square meters, with about 75 percent of urban families living in multi-story buildings. However, of them, close to 30% lived in housing with one bedroom, and 30% lived in housing with three or more bedrooms. For the same period, the difference in family income between low-and middle-income households and high-

[2] Tsinghua university: survey of Kaiyuansi neighborhood, Quanzhou, Fujian Province, 1999.

income households was three-fold, and, obviously, the difference in housing standard was much larger. Therefore, the intrinsic shortage of housing in the 1990s was largely a result of excessive housing consumption. The reform brought higer rents and housing sales, but the fundamental problem remained unsolved. The new living standards, housing investment mechanisms, and a multi-layered social security housing systems were just at the beginning of build-up (figure 2-02).

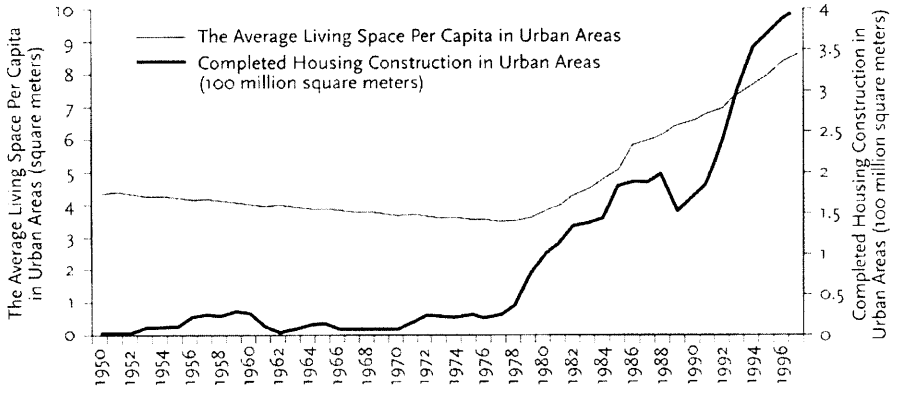


Figure 2-02: Completed housing construction and the average living space per captia in urban areas
(Source: *Modern urban housing in China 1840-2000*)

Density

From 1980, urbanization became an inevitable trend, and people came from villages, flowing into the cities. As the new economic and political system quickly substitutes for the old one, there is a regulation vacuum, resulting in increased uncontrolled low-quality construction activities: illegal buildings without necessary drainage systems were inserted into the inner city. Facing an increasing population and the requirements of modern life, old urban neighborhoods could not maintain a constant vitality for improvement and redevelopment. Finally, getting sunshine, ventilation, drainage and basic sanitation became a decisive reason for the diminishing of old neighborhood fabric.

A comprehensive survey of the run-down housing districts in Beijing carried out in 1990 showed the following picture: there are more than 20 million square meters of single-story houses in the inner city. Half of them are in condition grades III, IV, or V (on a scale of five grades, number I being the best), including 128 separate areas of run-down housing that account for 60 percent of the low-grade housing. The officially preserved

areas of the city's old housing account for only 3 percent of this 10 million square meters. The rest is virtually abandoned. The general condition of infrastructure and services in and around these areas is poor, and most houses have no sanitation, kitchen or other basic facilities; road conditions are very poor as well. Very high density has led to severe overcrowding, often with three generations living in one small house with a floor area per person of less than 2 square meters, with few parks, squares, or public active spaces. The current physical condition of neighborhoods in Beijing represents a common situation in other Chinese cities.

By the mid-1990s, China's reform of housing was over ten years old, and the huge shortage of housing in the early 1980s had been greatly relieved. But housing was still in short supply, not only in terms of production but also in terms of distribution. While demand for housing increased with the increase of urban population and rises in residents' income, 66 million square meters of market housing remained idle, representing over US$12 billion in stagnant funds. Most of the idle houses are located in the suburban areas or new development districts of cities, with high density (FAR 2.0-5.0, compared with original 1.0 less), and poor design -- the result of uncontrolled urbanization.

2. When Housing Becomes an Exchangeable Commodity . . .

In China, although individuals cannot own the land, more and more people accept the fact that they should buy their housing. The need for housing is so great that China has become the largest real estate market in the world. After a 150-year struggle, it is the first time that the Chinese, like people in other countries in the world, positively receive the challenges of the new era, with dreams, vitality, and confidence.

Economy

As a developing country, China's per-capita Gross National Product (GNP) was only US$700 at the end of 2000 and is expected to reach the level of moderately developed countries by the mid-twenty-first century. Hence, economic constraints are still an objective reality in the long run. As shown by the experiences and lessons of the previous fifty years, government policies and political systems also play an important role. In the first thirty years of the planned economy (from 1949), under the guideline of

"production first and life second," government investment in urban neighborhood development in the unstable political situation was generally insufficient. Indeed, the proportion of GNP invested in housing construction was extremely low, at about 0.78%. As urban population grew, the per-capita floor area kept declining, from 4.5 square meters in 1950 to 3.6 square meters in 1978. The state-set residential standard, in spite of its fluctuations, was also generally at a low level, ranging from thirty-odd square meters per household to fifty-odd square meters. Such a residential standard, together with the constraint of land use, made multi-floor buildings the only choice for housing at that time.

During the twenty years of reform and opening-up, state investment in housing increased dramatically. In particular, due to housing funds raised from multiple sources, the total investment in urban housing construction reached 7 to 8 percent of GNP, while the per-capita floor area in cities increases rapidly to 9.4 square meters in 1998. In 1998, the construction area per family in urban areas ranged between fifty-five to sixty square meters and, according to a survey of the State Statistics Bureau in 1999, housing was the first target of residential consumption. As a result, a housing unit with eighty to one hundred square meters of construction area was considered reasonable -- not only practically but also economically (Figure 2-03). By 2030, or at least by the mid-twenty first century, the gross floor area per household may rise to 120 square meters or more. Certainly, considering land use and other factors, housing will probably continue to take the form of concentrated multi-story buildings.

	Average Living Area (sqm)	Housing Price (US$/sqm)	Average Income (US$/household)	Ratio of Housing Price and Income
National	74.75	143.87	1093.49	9.84
Beijing	63.92	330.16	1571.81	13.42
Tianjin	62.62	202.55	1292.53	9.82
Shenyang	66.73	158.13	1028.67	10.26
Shanghai	57.18	231.49	1784.34	7.42
Ji'nan	80.56	103.10	1045.30	7.95
Guangzhou	88.25	257.89	1714.94	13.27
Chengdu	74.23	88.47	970.60	6.77

Figure 2-03: Housing purchase ability in seven big cities of China
(Source: China statistics yearbook, 1999)

Land

By contrast with its huge population, China has a serious shortage of land resources. The country's population density averages 135 people per square kilometer.

With a much higher density in the eastern region, the density in urban areas across the country averages close to 1,000 people per square kilometer.

From 1949, the per-capita proportion of cultivated land has kept diminishing with construction activity. At the end of 1990s, the per-capita cultivated land was only 0.08 hectare, and there is limited potential for new cultivated land. Consequently, economical use of land has become a pressing governmental issue. However, the consumption of land for urban construction is not a major reason for its diminution, as urbanization can, in fact, facilitate more intensive land use. Primarily, the per-capita land use in Chinese cities and per-capita land use in residential areas has been diminishing in response to sheer housing inadequacy. It was not until the 1980s, when consideration of urban environment and living quality drew more attention to this problem, that the per-capita land for construction purposes began to increase (Figure 2-04). Still, except for small cities that experienced relatively quick improvement, land in large and super-large cities remains in short supply (Figure 2-05). Moreover, the constrained supply of urban and residential land has constituted the major reason for the increasing number of storeys in housing in small, medium-sized and large cities in China for over half a century, and this trend can hardly be expected to change in the next few decades

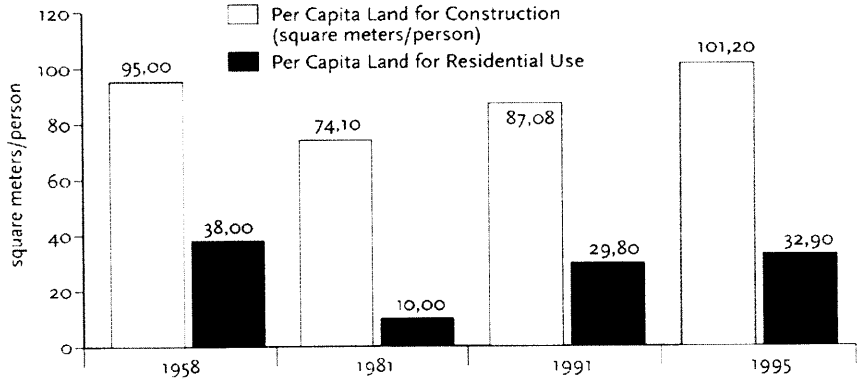


Figure 2-04: Per capita land for construction and residential use in the cities of China
(Source: *Land used for urban construction in cities of China, Urban Planning 1997/36*)

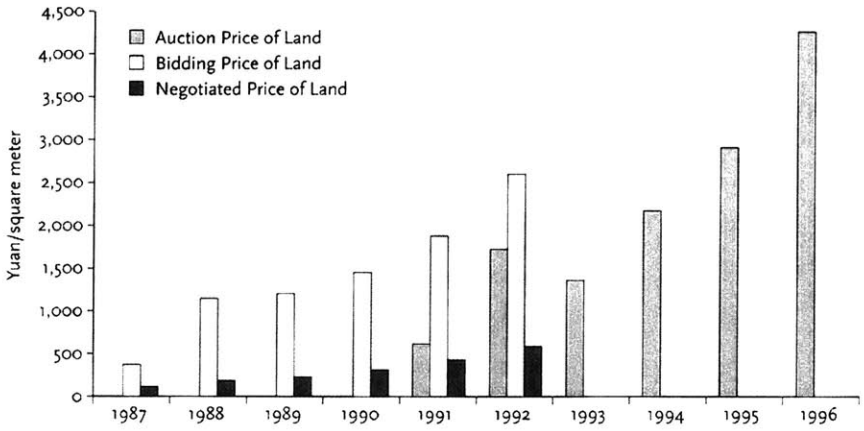


Figure 2-05: Rise in land prices in the 1990s
(Source: *Modern urban housing in China 1840-2000*)

Real Estate Booms

After 1980, there were two big booms in the real estate market, 1990-1995 and 1997-present. In the first boom, large-scale commercial and official districts replaced old residential neighborhoods in the inner city. Since investments were focused on those "hot high-value" areas, very few public improvements occurred in the neighborhoods that surrounded the renewal "modern districts". An ironical phenomenon occurred: vacant commercial and new buildings (normally high density land enveloped by international styles) consumed most of the investments and the best land, and simultaneously, tremendous amounts of old buildings in traditional neighborhoods that were close to "modern districts" urgently needed to be revitalized. The first boom of the real-estate market ended in the beginning of 1995. During this period, more than US$12 billion was wasted on those "modern districts" and major destruction of the traditional city fabric. On the one hand, large amounts of market-rate housing remained idle and, on the other hand, housing was still in short supply. The solution to this impasse was to establish an effective supply-demand system and to form a multi-level market.

In 1997, considering the possible impact of the Southeast Asian financial crisis and problems emerging in domestic economic restructuring, the central government chose to make housing a new source of economic growth. In particular, it decided to expand housing construction while simultaneously increasing the effective demand of residents for housing by discontinuing its distribution as welfare and adjusting the

expenditure structure. The second real-estate market boom has focused on urban neighborhood development from its beginning. Although in this boom, developers still tried their best to break planning codes to get high FAR, gradually, both developers and residents recognized that livable area was the most important place in their lives. The concept of comprehensive living environmental qualities became the main flow in current market-oriented neighborhood development. In 2001, the investment in real estate increased 25.3% than in 2000. The income of sales reached US$56.2 billion. The real estate market is stepping into a stage of long-run stable development (Figure 2-06).

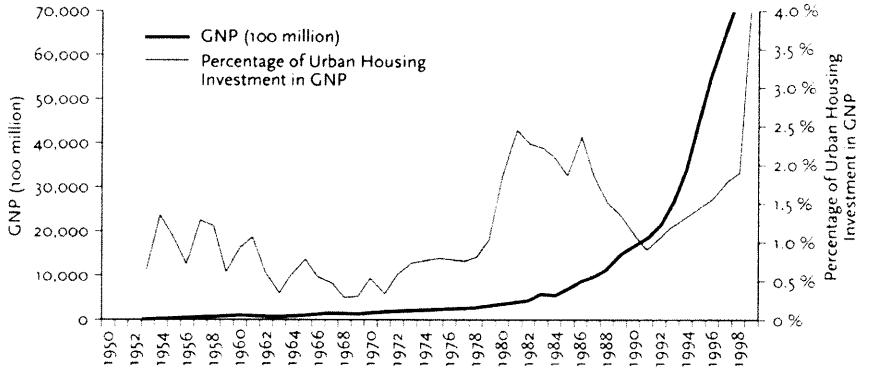


Figure 2-06: Urban housing investment as a proportion of GNP
(Source: *China statistics yearbook, 1999, & Modern urban housing in China 1840-2000*)

3. When People Desire New Living Standards . . .

The Chinese were, are and will be proud of their abundant cultural and human backgrounds, which exist in most of the traditional neighborhoods. However, modernity is so powerful that it created many new forms for cities and neighborhoods. From the very beginning, modernity respects both technology and humanity, but it has different expressions in different periods and in different aspects. The information economy is changing and will change our lives more widely and deeply than ever. It is time to practice new design methods and to prepare for coming reforms of Chinese urban neighborhoods.

Diversified Classes

The social development in China is currently uneven. Since the adoption of reform and opening-up policies, social stratification in China has accelerated, producing

diversified demands. In a short time, suburban villas, urban gardens, luxurious apartment buildings and buildings with mixed commercial and residential functions have sprung up. Yet, China is still a developing country. No matter how the incomes of urban residents are differentiated, it is still a pyramidally shaped society in terms of income (Figure 2-07). For instance, in Beijing, a metropolis serving as the country's capital, an investigation of the social strata showed that rich and powerful people only constitute a minority of the population on top of the pyramid. Typical middle class families in urban areas, by contrast, only have moderately well off lifestyles and are average wage earners, limited in their capacity to afford housing. The low-middle and lower-income groups comprise the largest portion of the population, but they have to rely on the social security system for their housing. Of course, both the urban spatial structure and the social structure of the population differ remarkably between the country's eastern and western regions, between super-large, large, medium-sized and small cities, and between historical and newly emerging cities. Therefore, the present market orientation of housing cannot solve the housing problem of all the people in China, and market-oriented neighborhood development cannot represent the entire content of urban neighborhood development. How to balance efficiency and fairness will be the main issues in future urban neighborhood development.

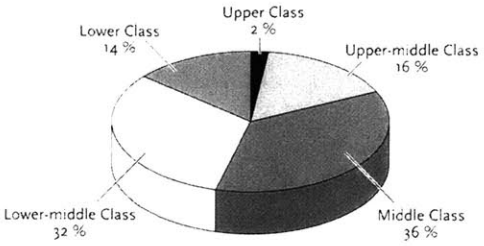


Figure 2-07: The structure of Social strata (Source: *Status quo and future of the middle class in Chinese cities*)

In fact, it is conceivable that with the improvement of state policy and a social security system, the maturity of the real estate market, as well as increasing diversification in investment and operation, Chinese urban residents will become more rational in their consumption psychology and behavior, and more conscious in their participation in community building. Eventually, the development of urban neighborhoods in China will progressively and steadily proceed along its own track.

Standardization

During the period from 1947 to 1957, by imitating the former Soviet Union, the Soviet residential standards were blindly introduced, a practice that was later characterized as rational design but irrational use. Standards in the 1970s were based on

"Suggestions of the Construction Commission on Revising the Construction Standards of Housing and Dormitories," issued in 1973. Standards in the 1980s were based on "Regulations of the State Council on the Strict Control of Urban Residential Standards," adopted in December 1983, and, in the 1990s, they were based on the national standards for urban housing construction passed at the National Conference on Housing Construction in 1998.

Unlike the standardization in the United States, where far less emphasis has been placed on an endpoint of production and far more on the shape and variety of intermediate components, materials, construction techniques and process management, the standardization in Chinese housing industrialization is very specific. This standardization focuses more on framing living standards according personal economic circumstances and social positions, and the standardization of building components and dwelling unit layouts into relatively narrow and fixed reference designs, on which engineering and material considerations have been brought to bear in order to produce a fully manufactured and mass-produced product. As we knew, this kind of standardization has its advantages by ensuring adequate living space, light and ventilation requirements for inhabitants in a very short time. Nevertheless, such a singular version of standardization in basic function and layout can also produce inefficiencies in provision, when people's spatial needs and acceptable preferences are more diversified and unexpectedly varied.

CHAPTER 3. URBAN NEIGHBORHOOD DEVELOPMENT IN DEVELOPED COUNTRIES

During the last 160 years, Chinese urban neighborhoods continued to receive foreign influences. Consequently, "Garden City" principles, "Neighborhood Unit" and "Neo Classical Town-planning" were tried out and used to develop new urban neighborhoods. Especially after 1978, reform and opening-up tightly connected China with other countries in the world. Therefore, some research which focuses on current theories and experiences of developed countries will be useful to explore further the modernity of Chinese urban neighborhoods.

1. New Urbanism

Growth Strategies in Regions

As an urban element, a single neighborhood development is closely related to the growth of the local city and the region. The growth strategies in a region decide the location, function, and spatial form of a neighborhood. Successful regional growth strategies are the first step of the success of a neighborhood development.

Peter Calthorpe indicated, "The problems of growth are not to be solved by limiting the scope, program or location of development. They must be resolved by rethinking the nature and quality of growth itself, in every context. People argue heatedly about growth: where, how much, what type, what density and if it is really necessary at all... Any city with a growth demand has several options. "It can (a) try to limit overall growth; (b) let the towns and suburbs surrounding the metropolitan center grow uncontrollable until they become a continuous mass; (c) attempt to accommodate growth in redevelopment and infill locations; or (d) plan new towns and new growth areas with reasonable transit proximity of the city center...Every region needs to find an appropriate mix of these very different options. "[3]

Whatever it is called, "limited", "managed" or "slow" growth, as we know, sprawl is always destructive in any growth strategy. Without an appropriate regional control in the region, development spreads into remote areas that are more receptive to

[3] Calthorpe, Peter. The Region, *The New Urbanism Toward an Architecture of Community*, 1994: pp. xi.

sprawl. This increases commuting distances and sometimes only extends and displaces the problem. At the other extreme, allowing the uncontrolled growth of existing suburbs and towns is our most common growth strategy during the urbanism period. A lot of contemporary developments have failed because they lack the fundamental qualities of traditional towns: streets with pedestrian scale, a defined public space, identifiable center and edge, and integrated diversity of use and population. Therefore, to create the places for casual and spontaneous interaction which generate vital neighborhoods, the quality of new development should follow new urbanism principles: "neighborhood for a diverse population, a full mix of uses, walkable streets, positive public space, integrated civic and commercial centers, transit orientation and accessible open space."[4]

Transit Neighborhood Development

Peter Calthorpe and Andres Duany largely developed the neotraditional design theories, which provide the fundamental theories for the New Urbanism Movement. Although their approaches are often described with different language, " Transit Oriented Development" (TOD) and " Traditional Neighborhood Development" (TND) respectively, the content of the underlying concepts is very similar. They both propose a model of a neighborhood in an urbanism process. "That is limited in area and structured around a defined center, depending on its context, each model offers a balanced mix of dwellings, workplaces, shops, civic buildings and parks. "[5]

This concept can be generalized as an attempt to reorient subdivision development toward patterns reminiscent of the United States' pre-World War II traditional communities. This movement draws several elements from earlier design periods, including mixed land uses, distinct neighborhood centers, and an interconnected street network. In the field of transportation planning, more comprehensive modeling evaluations would be helpful to determine the impact of neotraditional design, especially as it compares to other design approaches. Studies of isolated developments, real and hypothetical, need to be conducted to assess the performance of transportation systems. It

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[4] Calthorpe, Peter. The Region, *The New Urbanism Toward an Architecture of Community*, 1994: pp. xi.

[5] Duany, Andres and Plater-Zyberk, Elizabeth, The Neighborhood, the District and the Corridor, *The New Urbanism Toward an Architecture of Community*, 1994: pp. xvii.

will also be important to model the regional implications of neotraditional neighborhood design. A major limitation of the research so far is its restriction to isolated developments. The challenge for the neotraditionalist is to design communities held together by human elements, like in traditional American towns, but also not to ignore the automobile or the suburbanite's tremendous demand for convenient travel (Figure 3-01).

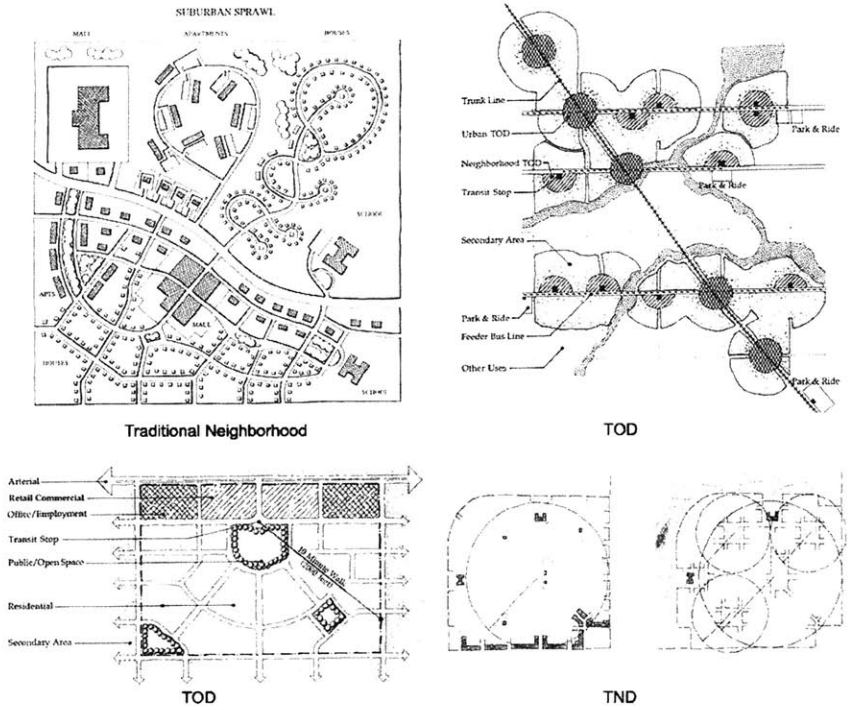

Figure 3-01: Traditional Neighborhood, TOD and TND
(Source: *The new urbanism toward an architecture of community*)

The transformation of old urban district to new types of uses is inevitable, following the decrease of traditional functions. The redevelopment represents a trend of the 1990's, which is the revitalization of old cities by changing from single-use to mixed-use of land. Planning a mutually supportive mix of uses enhances the success of many urban redevelopment projects. A mixing of uses can add variety and vitality to an area, and make it a more attractive, interesting place to live. The mixed use of lands means convenient commercial and personal services, readily accessible to work sites and residential areas, an increase of open spaces and natural environments, and convenient cultural or recreational amenities, which can enhance the attractiveness of old neighborhood redevelopment. Mixed land use is not a new idea, but it is still a main

direction for future urban redevelopment, especially in the terms of policies and regulations, city forms, and economic vitality.

The neighborhood's fine-grained mix of activities also includes a range of housing types for a variety of incomes, from the wealthy business owner to the street vendor. The true neighborhood offers a variety of affordable housing choices: garage apartments in conjunction with single-family houses, apartments above shops and apartment buildings adjacent to shopping and workplaces. The latter's traditional sites are not provided within the suburban pattern whose rigorous, sanitized segregation of uses precludes them. But the greatest contribution to affordable housing may be realized by the neighborhood's ability to reduce multiple automobile ownership and many of its associated costs. Some research showed: "By enabling households to own one less vehicle, the average annual operating cost of $5,000 can be applied toward an additional $50,000 increment of mortgage financing at 10 percent."[6]

The Spatial Identities of a Typical Neo-traditional Neighborhood

According to New Urbanism theories, it is necessary for the modern neighborhood to have a center and an edge. The combination of a focus and a limit contribute to the social identity of the community. The center is a public space, which may be a square, a park, an important street intersection, or the neighborhood's public buildings, ideally a post office, a meeting hall, a day-care center and sometimes religious and cultural institutions. Shops and workplaces are usually associated with the center. In the aggregations of multiple urban neighborhoods, retail buildings and workplaces may be at the edge of the neighborhood, where they can combine with others and intensify commercial and community activity. Urban Neighborhood edges may vary in character: they can be natural, such as a greenbelt, or man-made, such as infrastructure. In high-density urban areas, edges can be formed by infrastructure, such as rail lines and high traffic freeways that best remain outside the neighborhood. The latter, if generously lined with trees, become parkways that reinforce the legibility of the edge and, over a long distance, form the corridors connecting neighborhoods (Figure 3-02).

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[6] Duany, Andres and Plater-Zyberk, Elizabeth, The Neighborhood, the District and the Corridor, *The New Urbanism Toward an Architecture of Community*, 1994: pp. xix.

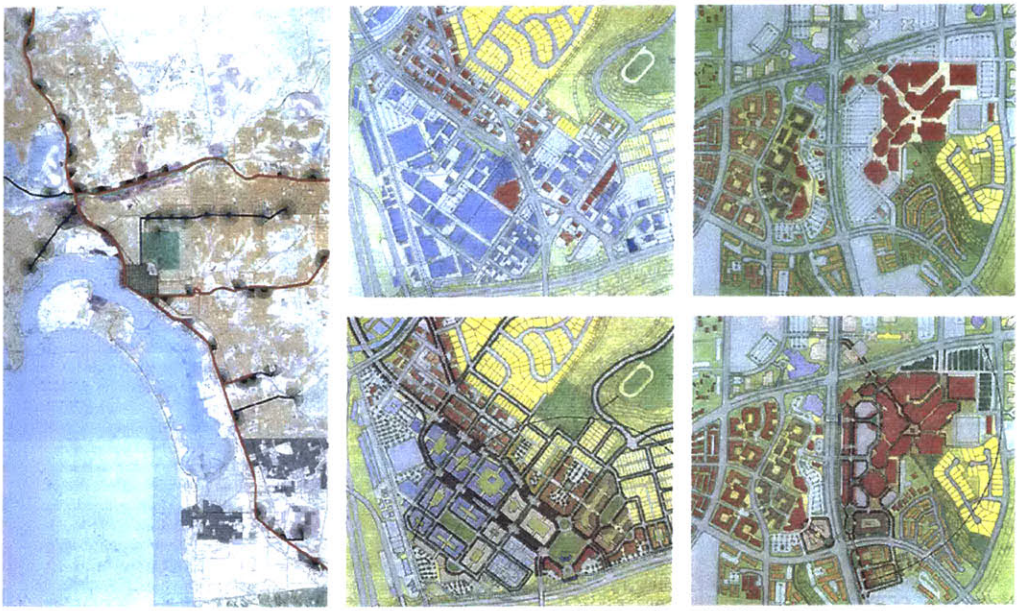

Figure 3-02: Calthorpe Associates' plan for the city of San Diego-TOD concept operates on several scales at once
(Source: *The new urbanism toward an architecture of community*)

"The optimal size of a neighborhood is a ¼ mile from center to edge. The distance should be controlled in the equivalent of a five-minute walk at an easy pace. The area circumscribed is the neighborhood proper, to differentiate it from green edge, which extends beyond the discipline of the ¼ mile. The limited area gathers the population of a neighborhood within walking distance of many of their daily needs, such as a convenience store, post office, community hall, school, daycare center and transit stop. The stop's location among other neighborhood services and within walking distance of home or work makes the transit system convenient. "[7]

Most importantly, pedestrian-friendly and transit-oriented neighborhoods permit a region of cities, towns and villages to be accessible without singular reliance on cars. Such a system gives access to the major cultural and social institutions, the variety of shopping and the broad job base that can only be supported by the larger population of an aggregation of neighborhoods. Neighborhoods streets are configured to create blocks of appropriate building sites and to shorten pedestrian routes. They are designed to keep local traffic off regional roads and to keep through traffic off local streets. An

[7] Duany, Andres and Plater-Zyberk, Elizabeth, The Neighborhood, the District and the Corridor, *The New Urbanism Toward an Architecture of Community*, 1994: pp. xix.

interconnecting pattern of streets provides multiple routes that diffuse traffic congestion. Neighborhood streets of varying types and hierarchy are detailed to provide equal consideration for pedestrian comfort and for automobile movement. Slowing the automobile and increasing pedestrian activity encourages the casual meetings that form the bonds of community.

2. New Building Technology

Research on building technology will give us the direction of future housing design in the technological domain. Furthermore, some important factors that will influence future cities can be abstracted from this research. Some examples of new technology include new digital tools that will increase the ability to solve complicated and comprehensive problems in the analysis of the neighborhood sites, tech-emerging standards that will create new housing types, connected systems and appliances that will strengthen communication between a single house and the whole city, and modular construction methods with computational standards that will enter the market to satisfy new home-financing requirements.

Site Investigation

InterSAVE[8] and GIS (Geographical Information System) can help: (a) assess and organize site information such as vegetation, hydrology, and topography; (b) explore programs that can model different site configurations for energy and resource efficiency; (c) examine each site for the potential of renewable energy from the sun and wind; (d) choose site materials and plantings that have low maintenance and water requirements; and (e) locate buildings to benefit from cool summer breezes while keeping out winter winds.

Through advanced site investigation methods, designers can recognize context and the impact of a building beyond the site boundaries, as well as understand that landscapes are interdependent and interconnected. They can also evaluate site resources to ascertain how each can enhance the proposed project and recognize the value of

[8] To learn more about InterSAVE, please read the book: *international survey of architectural values in the environment*, Ministry of Environment and Energy, Denmark, 1995.

existing buildings, streets, and other site amenities. From the beginning of design process, it is very important to analyze the site efficiently and locate buildings with nature, since optimized building shape and orientation can take advantage of sunlight and wind. For example, orienting a building to an east-west axis can decrease summer cooling bills as well as winter heating loads; and landscape elements can help energy conservation and returning energy and nutrients to the earth. This means site investigation can help find possible solutions that integrate site runoff, irrigation, composting, and recycling of building waste.

Digital Design Tools

Many would agree, "New digital tools will change the way that homes are designed by architects, selected by consumers, and constructed by builders."[9] New design methodologies, digital composite techniques, and building and computational standards will make it possible to rely less on traditional stick frame housing and more and more on adaptive, component based design and construction. The Internet information database and analytical visualization tools will provide more convenience for designers. Some difficult aspects, such as economic feasibility, construction schedule, energy consumption, and visual reality, can be quickly and accurately explored. The digital design improvements and the sharing of database information will enhance the communication between designers and citizens.

Modeling tools for simulating the behavior of larger systems, such as traffic and new algorithms used for architectural modeling and scenario testing, make it possible to evaluate large-scale community designs. Through CAD (computer aided design)/CAM (computer aided manufacturing)/CNC (computer numerical control) technologies, rapid prototyping and manufacturing can reduce design cycle time and encourage the designer to experiment before deciding on a final design.

We can use computer modeling whenever possible to investigate the performance of various thermal envelope materials and configurations to get visual and thermal comfort in three steps:

[9] House_n: The MIT Home of the Future. https://architecture.mit.edu/house_n

i) Through recognizing the influence of site and building orientation when designing buildings and selecting walls and glazing materials, environments can be provided that are visually stimulating, where people respond well to variations in lighting levels, comfortable contrasts and pleasant changes in light and shadow.

ii) Spatial form illumination can be optimized with the appropriate colors, surface treatments, room proportions, and ceiling heights for the tasks involved, through choosing enclosure and interior systems that perform well in varying seasonal conditions.

iii) Designers can take advantage of prevailing breezes to maximize natural HVAC system, through considering creative integration of daylight, energy efficient ventilation options, and effective control strategies before engaging mechanical systems.

Construction Technology

Industrialization brought western countries prefabricated and modularized construction systems and methods. New materials, such as high strength concrete, fiber reinforced concretes, fiber reinforced polymers (FRPs), and other fiber-reinforced materials are widely used. By using computer, huge databases, and high-speed telecommunication technology, new design technologies, such as 3D-CAD, CAD/CAM, and virtual reality technology broaden design concepts to include connection design for automatic assembly and construction planning simulation.

Based on technology progress above, currently, modular home manufacturing (7%), HUD-code (mobile home) manufacturing (12%), and Panelized home manufacturers (38%) totally account for 57% of all sales of homes in the U.S. market. 95% of all homes built use prefabricated components such as factory-made roof trusses, floor trusses, pre-hung doors, wall panels, and other components. A comparison show that: it takes 12 months to build a typical "stick-build" home and 1-3 months to build an industrialized builder home, but it only take 6-8 weeks to build a panelized package home and 1-3 weeks for a double section HUD-code or modular home. Industrialization and technological progress have lowered the cost of construction and increased the quality and quantity of housing.

3. Sustainability

Sustainability is currently the most pressing, complex, and challenging agenda facing architects. The ever-expanding urban population of the globe has meant that over the last decade sustainability has moved on from being a limited concern, focused largely on global warming, to one where much wider issues of the environment and ecological health are at stake. As we know, there are two basic points in human construction activities: technology and social purpose. Since the final aim of construction is to create reasonable relationships between them, sustainable development can be a very useful bridge.

Ecological Efficiency

With the progress of technologies and building materials, the concept of ecologically sensitive development has become more and more popular. Most of the world's resources are used for supplying cities. Ecologically sensitive development represents the trend of sustainable development. Recently approved bond financing for environment improvement in the developed countries signals that cities are changing their forms to merge into the ecologically sensitive development trend of a new era. Urban developments are now creating new ecological standards that can increase future development potential and the use of land. In return, the residents who follow these new ecological standards will greatly benefit from a healthy environment. In the long run, ecological expenses will be reduced for city redevelopment when a family depends less on vehicles, or when new clean resources, such as solar energy, can be widely used.

To achieve sustainability, cities need to strive to reduce their dependence on external land areas. It is foreseeable that adaptive population densities, a balanced mix of uses, and good pedestrian linkage between uses and transit stops will characterize the future of ecologically sensitive development. The ecological locations of human settlements no longer coincide with their geographical locations. An ecological city in the future will be a city that minimizes its ecological impact, where landscape and built forms are balanced, buildings and infrastructures are safe, and new environmentally friendly energy sources are utilized.

Five distinctive potentials can be postulated to make nature our design guide: "learning from nature, using nature's models to inform, making nature explicit, using

nature for ecological accounting, and every species is a designer."[10] It is clear that many architects are exploring their practices of sustainability according to these classifications.

"Learning from nature" tells us, "...an analogy can be drawn between building (species) and cities (habitats). Learning from nature encourages an appreciation of how these interact, in resource terms, with energy, water and materials going in, and waste, pollution and contamination coming out. In effect, we have an architectural ecosystem where the restraint is arguably more a sink limit than a resource one..." (Brian Edwards & Chrisna du Plessis, 2001). Furthermore, the idea of "Using nature for ecological accounting" can generate an evaluation system that indicates the selection of building types and other service conditions. Creating and maintaining the health of habitats will be the first rule in the future of design.

Clearly, architects welcome more on the aspects of "using nature's models to inform" and "making nature explicit," because both of them provide an abundant language system of forms. From the former, a basic idea can be drawn: biomimicry, which can be the new source of our spatial form creation. And the latter tells us that architectural design can view nature as a part of a building, either inside or outside, either directly in the construction materials or in the visual scene and pleasure that can provide.

"Nature teaches us that all living creatures exercise design choices in some fashion. Nearly all options are limited by genetic inheritance -- a particular ant can only build a particular type of ant hill -- but it remains true that in nature all the parts contribute to the designed whole. The Bible claims that this is the hand of divine creation; Darwin on the other hand, puts it down to natural selection. Either way, every living creature from high species to low is actively engaged in the search for richness, complexity and, ultimately beauty itself. Applied to human ecology this means that everybody is a designer -- every member of the human race is an architect since we all modify our environment and exercise design choices." (Brian Edwards & Chrisna du Plessis, 2001)

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[10] Brian Edwards & Chrisna du Plessis, Snakes in Utopia: A Brief History of Sustainability, *Architecture Design*, 07-08/2001, London, pp.24.

Cultural Landscape

Most of the above five classifications are focused on technology layout, which is only one aspect of sustainability. Traditional values and contexts are considered more in the contemporary concept of designing a sustainable urban neighborhood, because they endure and represent sustainability themselves. Another aspect of sustainability is social sustainability, which could be called "cultural landscape." This means a respect for humanity and nature, an symbol for the growing complexity of future life, and a kind of return to historicism and rationalism. In other words, the traditional factors, natural environment and context will become more important in our construction activities.

A number of developments are converging to create a fascinating environment to examine the relationship between energy, sustainability, materials, and technology within a city. Until just recently, most communities were based on a relatively static, physical infrastructure. These old communities will change slowly, relative to the breakneck speed of advancing technology. Old models will be revised to adapt to changes in life-styles. There is an opportunity to use new developments in the U.S. and other developed countries to radically rethink communities for the digital age and to provide effective models that older communities will eventually incorporate. To understand how change will occur, we must study not only the design of homes and buildings in the community, but economic and social models that bind communities and their organizations together.

Because the concept of a cultural landscape is relatively new and has not been sufficiently tested in the real world, questions remain as to the viability of this trend. Significant evaluation remains to be completed as to whether this design concept makes economic sense. For example, will developers be discouraged from planning the denser street networks called for in a neighborhood due to high infrastructure costs? The same question applies for the provision of alleys. Another aspect of the viability of design is simply whether the public truly wants to live in the type of cultural landscape being proposed. Are mixed land uses, integrated housing types, and increased street life characteristics that the public values and will seek out in a competitive real estate market? These questions will be answered primarily through the passage of time, but specific future research documenting culture development will serve as a useful tool for predicting whether this new design concept is a passing or permanent phenomenon.

In studying the evolution of neighborhood design and in trying to understand its current evolution, it is important to emphasize that contemporary urban neighborhoods exist in a diversified economic, social, and technical circumstance -- in short, diversified cultures that is drastically different from any seen previously. One of the major changes today's desingers are facing is that urban neighborhoods, the basic unit of urban development, are no longer inextricably connected to the urban core. Decentralization has reached a level today where suburbanites are entirely detached from downtown areas. They are no longer dependent on downtown areas for employment or shopping. In fact, virtually all of the amenities of centralized urban cores can now be seen in the suburban neighborhoods. All of the components of true cities exist in the suburban neighborhoods. Designers' approach to this phenomenon is to take these urban elements and arrange them with the force and meaning found in cultural and economic centers: that is, to arrange these newly relocated pieces of the urban core into towns or small cities that offer their residents a real sense of community and a sense of civic awareness. Whether the new urban neighborhoods can accomplish their intents within the framework of our economy and society remains to be seen. It can be said that this most recent trend in urban neighborhood development illustrates a yet higher level of understanding of current western cities, and a continuation of the belief held by each generation of designers that our built environment could be better in the future.

CHAPTER 4: CASE STUDIES FROM DEVELOPED COUNTRIES

1. A Classical Project: Battery Park City

Battery Park City is generally regarded as one of the most successful examples of urban waterfront redevelopment. "It has been hailed as a triumph of urban design and a financial bonanza which funded affordable housing in New York's most needy neighborhoods." "It is home to over 7000 residents, and 30,000 employees and thousands more people visit its splendid public spaces every day."[11]

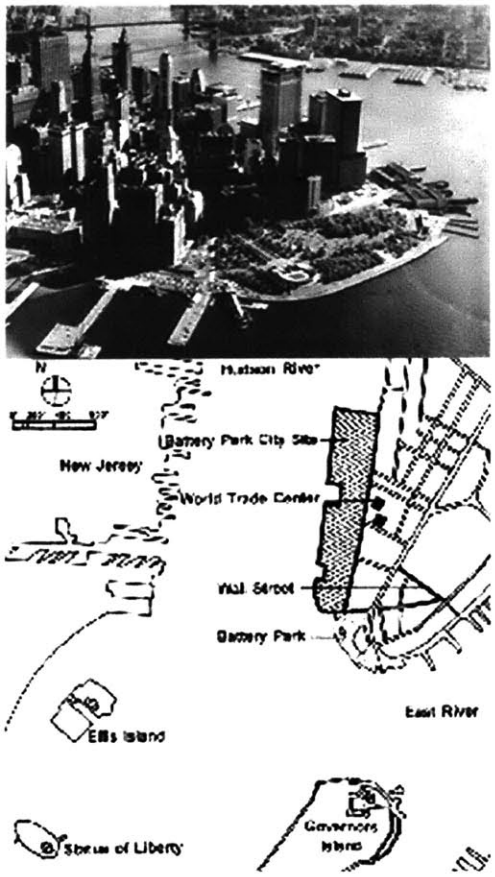

Figure 4-01: The site in the 1950s
(Source: MIT RVC Library)

Battery Park City has one of the world's most prominent sites: the Hudson River waterfront at the tip of Manhattan, New York. The ninety-two acre site created from landfill is adjacent to the World Trade Center and Financial District. The site was previously occupied by cargo piers and ferry docks which had been abandoned for some time (Figure 4-01).

All of the early proposals (dating from the 1960s) suggested landfill in the lower Hudson River area, and some office and residential buildings, although various agencies differed on the scope and focus of development. It took the State and city twenty years to agree that Battery Park City would be redeveloped as today's Battery Park City. The site remained a large vacant landfill for ten years after the demolition of the dilapidated piers in 1970. Three major problems emerged in the mid-1970s: (a) the rigid and complex Master Development Plan could not be implemented since the pod was too large for any

[11] Gordon, David L.A.. *Battery Park City, Politics and Planning on the New York Waterfront*. Gordon and Breach Publishers, 1997.

developer; (b) there was no market for the office space, particularly with the World Trade Center just nearing completion; and (c) both the City and the State were in a fiscal crisis due to changes in the economy. In 1979, the poor market conditions for offices were beginning to turn around. The highly recommended urban design firm Cooper and Eckstut was hired to examine the former (1969) design (Figure 4-02) and create a new 1979 plan (Figure 4-03).

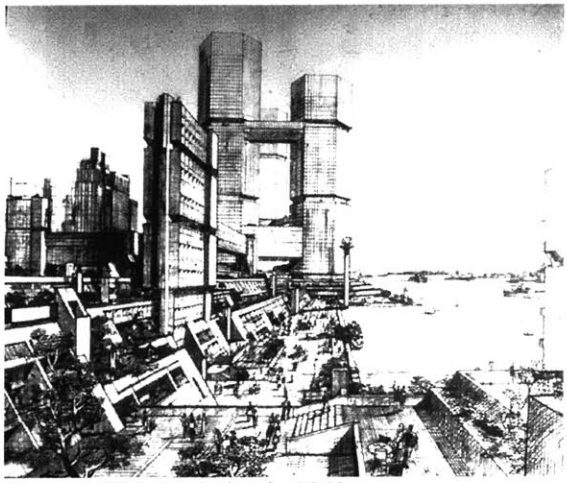

Figure 4-02: The design in 1969
(Source: MIT RVC Library)

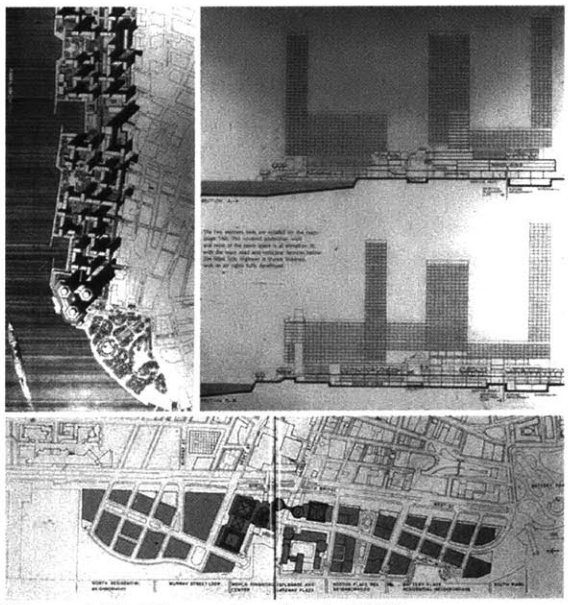

Figure 4-03: The master plan in 1979
(Source: MIT RVC Library)

David Gordon pointed out, "The primary physical design concept of the 1979 Master Plan was a simple extension of the traditional street and block structure of lower Manhattan." This may not be an innovative approach nowadays, but it was a radical design initiative in 1979. "For the previous four decades, the redevelopment of cities had been influenced by the techniques of large-scale modern architecture: super-blocks, separation of land uses, elevated streets and building designs which aggressively proclaimed their difference from the historic fabric of the city." [12]

The new plan was based upon eight well-known design principles:[13]

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[12] Gordon, David L.A., *Battery Park City, Politics and Planning on the New York Waterfront*. Gordon and Breach Publishers, 1997. pp.66.

[13] Gordon, David L.A.. *Battery Park City, Politics and Planning on the New York Waterfront*. Gordon and Breach Publishers, 1997. pp.66.

i) Battery Park City should not be a self-contained new-town-in-town, but a part of lower Manhattan.

ii) The layout and orientation of Battery Park City should be an extension of lower Manhattan's system of streets and blocks.

iii) Battery Park City should offer an active and varied set of waterfront amenities.

iv) The design of Battery Park City should take a less idiosyncratic, more recognizable, and more understandable form.

v) Circulation at Battery Park City should reemphasize the ground level.

vi) Battery Park City should reproduce and improve upon the strengths of New York's neighborhoods.

vii) Battery Park City's commercial center should become the central focus of the project.

viii) Land use and development control should be flexible enough to allow adjustment to future market requirements.

These design principles were illustrated by a simple diagram, which became the symbol of Battery Park's new plan. Cooper and Eskstut use this "figure-ground" method to analyze the site and present their emphasis on public spaces (Figure 4-04). This method has been used in Nolli's 1741 plan of Rome and had been featured in the influential book *Collage City* (Gordon, 1997).

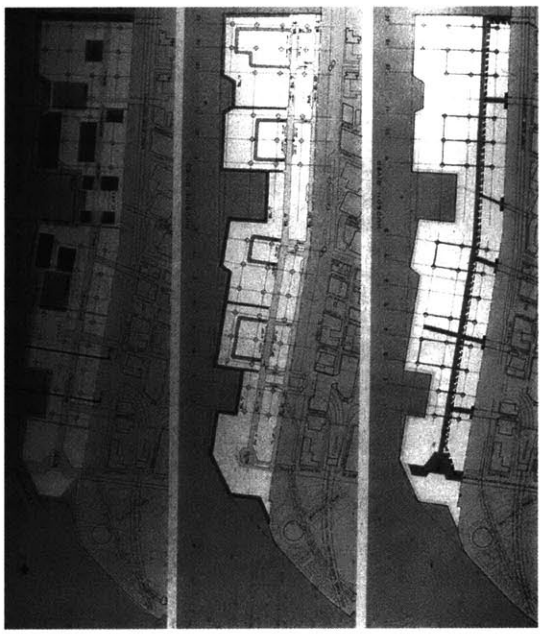

Figure 4-04: The design diagram
(Source: MIT RVC Library)

The 1979 Master Plan focused upon the quality of the public spaces to be created at Battery Park City, rather than attempting to illustrate the design of the buildings. Richard Kahan, president of BPCA (Battery Park City Authority), realized the important role of public space in shaping the image of the project to the rest of the city and to potential private investors. BPCA built

most of the public spaces itself. It completed the spaces in advance of private development in order to increase the value of the adjacent sites. The first project was the 1.2-mile riverfront Esplanade in front of Gateway Plaza, designed by landscape architect Hanna Olin. The first phase of the Esplanade opened in June 1983 and was an immediate critical and popular success. New Yorkers strolled the walkway and enjoyed the view, despite the difficulty in reaching a site isolated by construction and the West Side Highway.

Battery Park City soon launched into an extensive program of public space and institutional design to invite all people onto the site. The first of the new public facilities was the Winter Garden in the World Financial Center. The 125-foot-high vaulted glass room is home to sixteen palm trees and frequent public events throughout the year. The careful attention to detail and design quality in public spaces was effective. By 1986, with only a fraction of the buildings completed, Battery Park City was hailed as "The Next Great Place" (Figure 4-05). As the rest of the parks such as the South Cove were finished, observers heaped praise on the project (Gordon, 1997).

Figure 4-05: View of Battery Park City
(Source: MIT RVC Library)

Battery Park City is now comprised of eighteen buildings with 4,800 middle-to upper- income apartment units, as well as the World Financial Center with its four office towers and Winter Garden. One third of Battery Park City consists of parks and open spaces (Figure 4-06). By providing public space, the image of the project improved and private development was able to increase the value of the adjacent sites. Battery Park City extended New York's street grid to a waterfront landfill site and called for apartment

buildings whose massing and appearance are evocative of Manhattan's historic apartment districts.

Figure 4-06: Water front design
(Source: MIT RVC Library)

2. From Failure to Success: the Development Process of Harbor Point [14]

Located at the edge of Dorchester Bay in what is now called Columbia Point Peninsula, Boston, U.S.A. Harbor Point has undergone several changes over the years and was actually transformed from military barracks, prisoner of war camps, and a piece of isolated and cheap industrial land, to a 3000 people community. What is actually known as Harbor Point, a very successful mixed-income housing project in South Boston, was about 15 years ago one of the most dangerous, deteriorated and stigmatized minority housing projects in the whole of New England: Columbia Point (Figure 4-07).

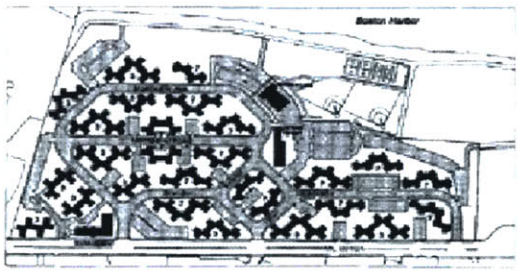

Figure 4-07: The Plan of Columbia Point, 1950s
(Source: MIT RVC Library)

Constructed in 1951 under the 1947 Federal Act for Low-Rent Housing and hailed at the time as a significant step toward obliterating poverty, Columbia Point in Boston, with 1,500 families occupying a site of 40 acres, sadly faced the results of physical and social isolation, with no perspective schools, small retail areas, churches, and public transportation. The complex consisted of 75 seven-story apartment buildings and 12 three-story structures, all placed

[14] Based on Roessner, Jane. *A decent place to live: from Columbia Point to Harbor Point: a community history*, Northeastern University Press, 2000

at almost equal intervals in a bland and undistinguished landscape. The commercial and community facilities that were originally intended to accompany the project were never built, and the sheer physical isolation on a spit of land that was an old refuse dump continued to be exacerbated by a lack of public transportation. By 1978, Columbia Point had been taken over by gangs and drug dealers. It was a no man's land where not even ambulances or fire trucks would go in without police escort. At times entire buildings were boarded up. The vacancy rate was so high that out of the initial 1504 families there were only about 350 left and they were still there only because they had nowhere else to go (Figure 4-08).

Figure 4-08: View of Columbia Point in the 1970s (Source: MIT RVC Library)

In 1978 Joe Corcoran, Joe Mullins and Gary Jennison (CMJ) went to the Columbia Point Tenants Task Force Headquarters and presented them with a chance to change the situation: a 50/50 partnership with CMJ for the redevelopment of the complex and its introduction as a mixed-income community. CMJ proposed to completely change the image of the area and turn it into "community" not just another "housing project," and offered the security of assigning each of the remaining tenants a place in the new development (no dislocation or relocation) with full participation and involvement of the tenants in the design process. Goody, Clancy and Associates, the architects approached by CMJ, listened to and worked with the tenants for months and finally produced the preliminary master plan that the tenants wanted. The project, now called Harbor Point, has undergone substantial redevelopment as a target of a mixed-income housing strategy.

The plan of the new Harbor Point was based on the traditional urban neighborhood model, such as the South End and Back Bay layouts, and on the New Urbanism ideas of city growth and development. Streets play a very important role in the whole plan. The incorporation of green areas in the interior of the blocks does not intend to divert attention from them, but on the contrary, highlighting them as meeting places and axes for direction and location. The landscaped Mall that is located in the center of

the neighborhood as the main open and recreational area, as well as the primary axis to the waterfront, was conceived after Commonwealth Avenue in the Back Bay and is planned as the container of higher-density buildings, retail areas and communal facilities. It works as the community's Main Street and common meeting ground, and as the link between the public access street and the water's edge. It is defined by block-length buildings with unified facades, which give it a certain richness and sense of contained space (Figure 4-09).

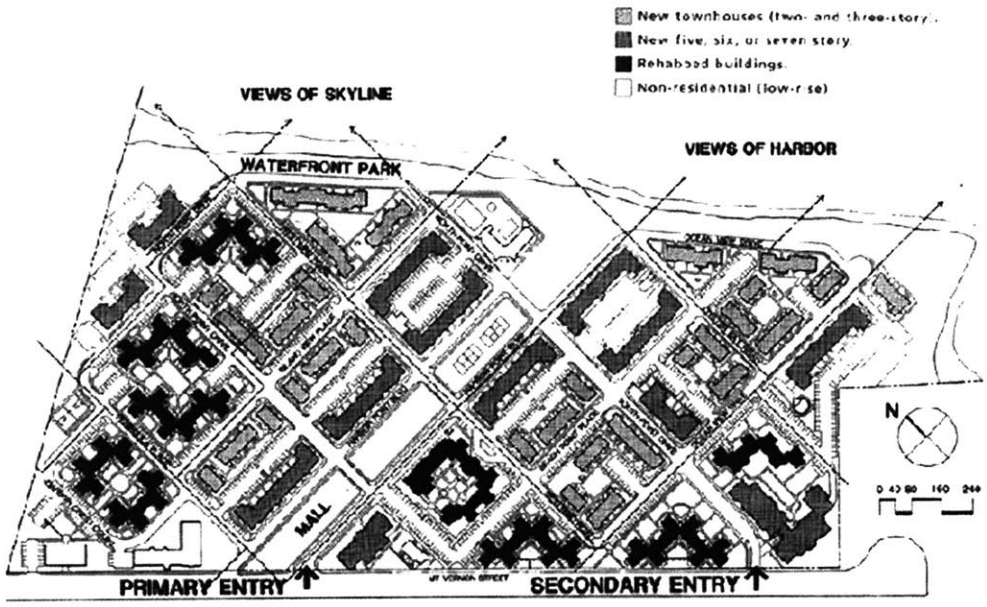

Figure 4-09: Plan of Harbor Point, 1980s
(Source: Harbor Point management office)

Because in the plans for Columbia Point, the waterfront was practically neglected in the layout of the buildings and streets; only a small percentage of the tenants had a good view. The new plan for Harbor Point attempted to maximize waterfront use and to give everyone a glimpse of the water; the streets and buildings were inserted in a grid layout at a 45-degree angle with respect to the shore facing Boston. To maximize the resources available, almost 1/3 of the existing buildings were preserved and renovated (the grid was adapted to them) and the underground network of facilities (very expensive and complex due to the difficult conditions of the soil) was not disturbed and was reused. All the mid-rise buildings have first floor apartments reserved for families with children, for they have direct access to the backyards and small private back patios. Most of the townhouses are designed in such way that they can easily be adapted to different families

and lifestyles, making the heterogeneity of the complex seem more natural, since no apartments are assigned specifically to certain families. The project has 1,283 units distributed as follows: 198 in townhouses, 258 in 3-story garden apartments and 827 in 5-7-story elevator buildings. They range in size from one bedroom to six bedroom apartments and there is a density of about 28.6 units per acre – almost a fourth of that presented by the first two projects (Figure 4-10).

In opposition to what had been the pattern of previous housing projects, parking spaces in Harbor Point were not located in large lots but along the curves in front of each of the townhouses and in small parking lots behind the mid-rise buildings, still necessitating to use of sidewalks and streets to get to each of the units from them (supporting the idea of the importance of the street). There are no underground parking lots due to the bad soil conditions and the need to promote social interaction through the use of the common spaces. Another good implementation is that there are no spaces assigned to anybody in particular; still the system works quite well (Figure 4-11). The ratio of parking spaces to units is about 1:2.

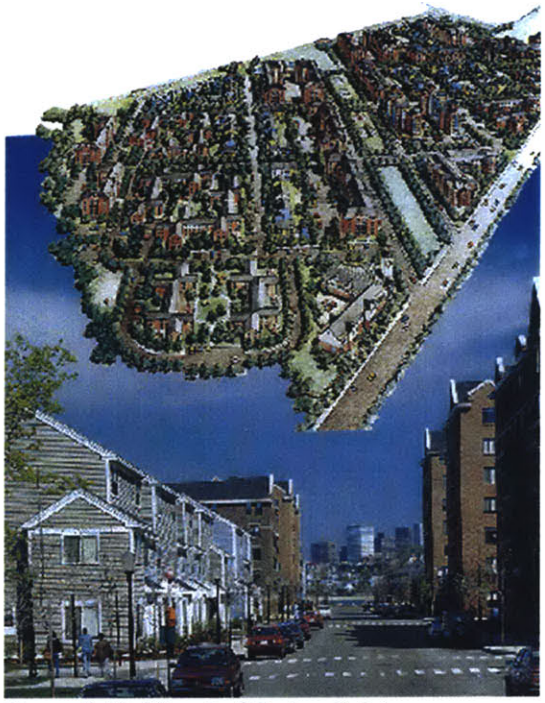

Figure 4-10: View I of Harbor Point
(Source: Harbor Point management office)

Figure 4-11: View II of Harbor Point
(Source: MIT RVC Library)

Figure 4-12: View of central open space
(Source: MIT RVC Library)

After a period of depression from 1988-1992, the project's occupancy rate was as high as ever and it was considered a desirable place to live by many families, students and singles who took advantage not only of the amenities offered but of the location, the private security and the fact that there were rules which were being enforced. Residents also liked the diversity of the people and the richness it gave to the community (Figure 4-12).

3. Ecological Urban Neighborhood Developments in Europe

The building density and energy intensity of cities created changes in urban microclimates. With increased air pollution, noise and heat island effect, our urban neighborhoods are facing threatens come from climates and air quality. In recent ten years, more and more researchers have focused on how to achieve environmental sustainability in our cities and neighborhoods. With 80% of Europe's population now living in cities, European countries felt more pressure and began earlier than other countries in the world. Even though there are few mature sophisticated analytic tools, which cannot handle with so much complexity and uncertainty, and few successful examples, people have already found several key points and are exploring further on sustainable urban neighborhoods.

Case I: Concept Houses in the Future[15]

The Slim House-Model Terrace, designed by Pierre d'Avoine Architects, was constructed as a show house at the 1999 Idea Home Show -- a life-size, timber-built model of a simple linear (5m X 25m), self contained steel frame and timber stud panel structure (Figure 4-13). As a spokesman for the jury commented,

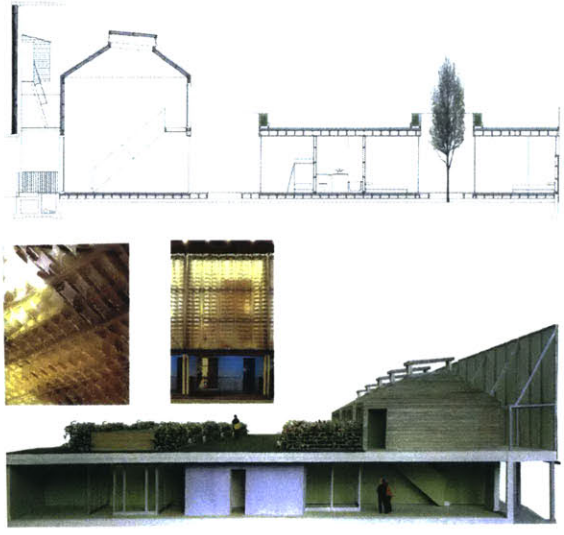

Figure 4-13: Sections and details of Slim House (Source: *Modern house 2*)

[15] The Concept House competition in the UK is the interesting case of an architectural competition organized by an essentially populist nation newspaper in conjunction with the professional architectural body, the Royal Institute of British Architects, 1999.

"over the course of the judging, a clear winner emerged with a simple yet ingenious solution to the brief, spreading the terrace house across the entire dimension of the site. We all believe this scheme works as a show home and as an alternative prototype for urban living."

The Slim House was essentially a modest proposal, designed for prefabrication, ease of transport, adaptability, energy-efficiency, and potential re-cycling, for less than US$ 100,000. It offered a reinterpretation of the traditional British terrace, in which the gardens were placed on the roofs, which provide the potential for communal use. This constitutes the basic unit of Model Terrace (Figure 4-14). Within the terrace, the layout of each house can be varied according to household requirements. This is based on five fundamental principles: loose-fit and flexible accommodation, raised threshold, roof garden, active façade with urban front, and vertical extension. The central principle is that the garden could be opened up to form a large, green communal area for relaxation and safe children's play above the level of the street. By contrast, the internal courtyards would provide more intimate open areas dedicated to household use, which also perform the function of providing acoustic buffer zones and light wells between rooms. In the Slim House, it is easy to see a relationship with Frank Lloyd Wright' Broadacre City (Figure 4-15), a conceptual project for a

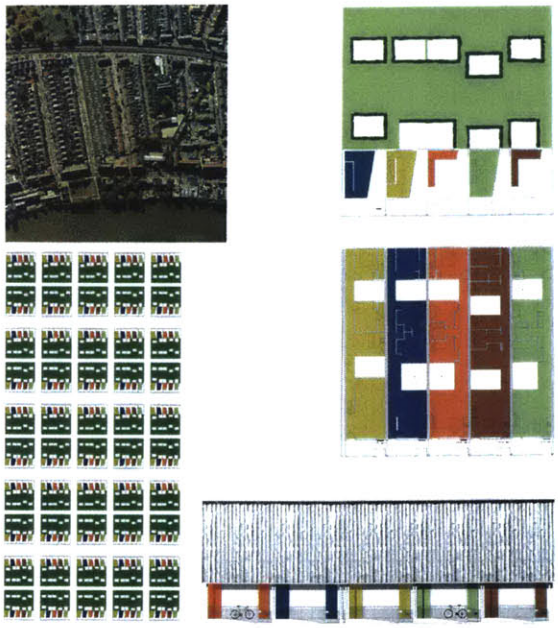

Figure 4-14: Plan and elevation of Slim House
(Source: *Modern house 2*)

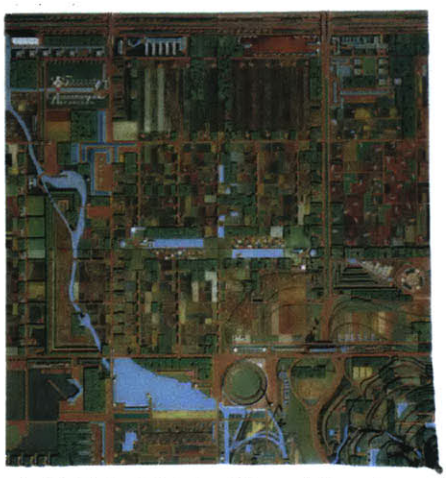

Figure 4-15: F. L. Wright: Plan of Broadacre City
(Source: *Modern house 2*)

contemporary city, in which the fundamental unit was the single-family house. It ranged in size and type from the "minimal", one-car, DIY prefab to the 5-car dwelling of "machine-age luxury."

The Slim House questioned a popular trend based on sci-fi fantasy and imagery, conforming to a long Western history of ideas that has placed technological progress at the heart of a linear conception of human social history, marching on towards an ideal of final technological supremacy over nature. It could be seen as a prototype to generate urban blocks, as well as to describe a new environmentally sustainable model for the mass-produced or factory-built contemporary urban house. In other words, it clearly illustrated the most pressing concerns about demographic trends, ecological impact, and the implications of technology, within a framework that implicitly discouraged use of conventional "futuristic" images and ideas (Figure 4-16).

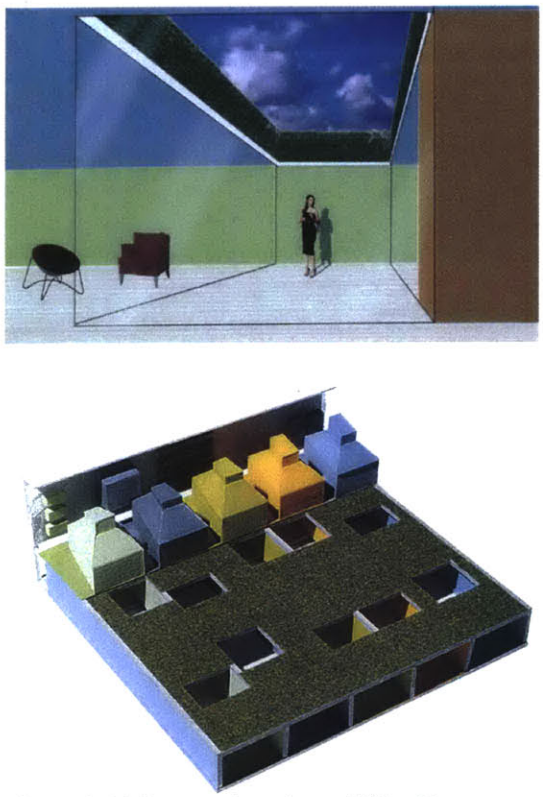

Figure 4-16: Perspective view of Slim House (Source: *Modern house 2*)

Case II: UIA Competition, Barrio Chino, Barcelona

The competition brief required the replacing of two housing blocks with a bower density mixed-use programmer comprised of 65% dwelling. A new public space was to be integrated and roads were to be widened as a matter of priority. The overall site area amounts to 10,500 square meters. The area is recognizable as a district in the process of impoverishment, where redundant buildings slide toward squalor.

"The Barrio Chino is not beautiful – it is admirable. It is not picturesque - it is firmly anchored in a living tradition. All the qualities of a city are there at the heart of the contemporary metropolis. Nothing need be subtracted or added. But the Barrio Chino is being corroded by decay. Even worse, it is being driven back by the pressure of 'hypo-

allergenic' projects. Modernism and sanities are the keywords. The object of the competition is clear: a necessary destruction in order to build a new one, the widening of roads in order to free public space, to reinforce activities in order to promote the profitability of their functions. "[16] (Figure 4-17).

A response is required that both sets a precedent and functions with an acknowledged movement of urban redemption. Le K Architecture's scheme provides a dual-aspect city block (Figure 4-18). The first aspect is a public, or rather,

Figure 4-17: Master plan of the new city blocks
(Source: *Architecture design, 07-08/1999*)

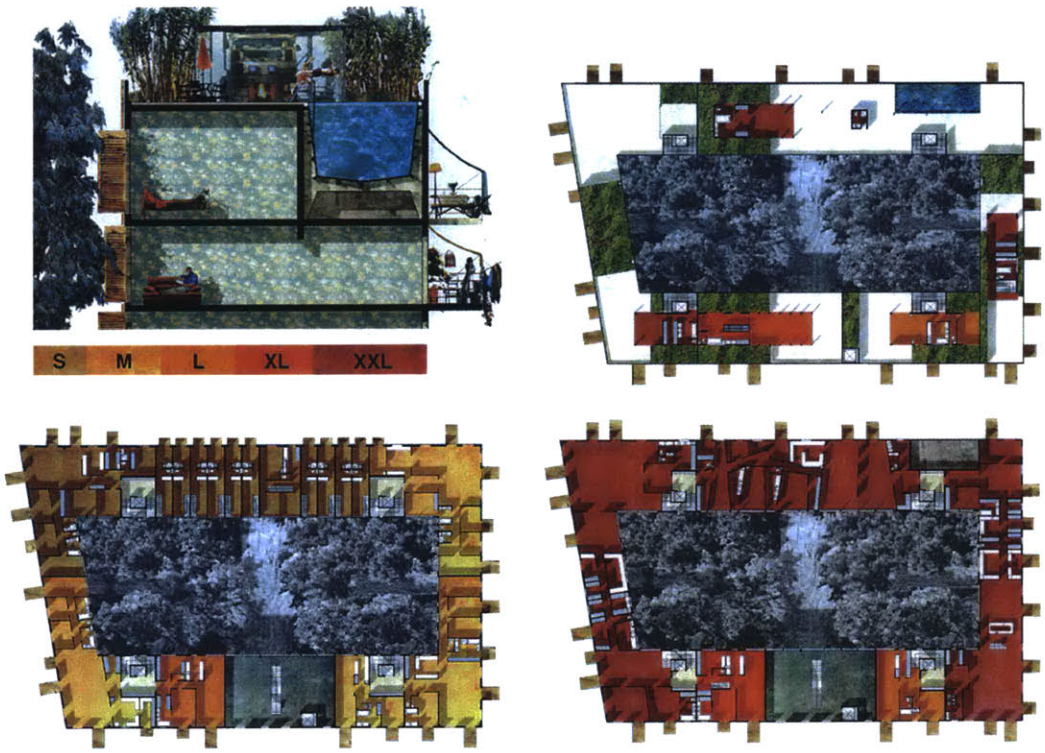

Figure 4-18: Section I and plan of block housing in Barrio Chino
(Source: *Architecture design, 07-08/1999*)

[16] LE K Architectures, In Vivo, *Architectural Design*, 07-08/1999, pp.85

"hyper-public" face. It is the framework for high-density living. Mixing re-appropriated old-fashioned elements and low-key technology, the building façade stands as a replica of the original which is not formal but which reproduces existing activities. The roads become wider, but the balconies extend out to the old road line. All the apartments are conceived in such a way as to encourage the inhabitants to use their balconies as they previously did. The ground floor is completely dedicated to commercial activities and to service outlets.

The other aspect provides the benefit of a modern environment, which the city of the past lacked. "Bathed in light, silence, nature, coolness in summer, heat in winter, etc; the ground is fertile here as in an orchard. This is what we called the 'bio-face'. A true urban nature reserve in which giant eucalyptus and Provencal bamboo co-exist, the bio-face is also a public space but it is intended as a place of contemplation and meditation. This area is not completely accessible; one can only across it or stop there on a single central path bordered by orange trees (Figure 4-19)... Small alcoves allow access to the parking areas. The operator controls the lifting platforms form a mobile cabin. This system is designed as much to eliminate endless and insalubrious ramps as to uphold the principal of inhabited parking lots. A thermo-regulatory bio-climatic system for the bio-face consists of hot air from the upper levels being drawn into a serious of straw-like tubes. Ducted to an underground cave and cooled by running water, it ends up as a jet of stream around of the bamboo."[17] (Figure 4-20)

Figure 4-19: Section II of block housing
(Source: *Architecture design, 07-08/1999*)

In conclusion, currently, the whole Western society is attempting to develop the integration of complex ecological and social orders. We have the technology to impact the environment, but technology is not enough. We also need a value system that sees appropriate technologies as a matter of principle. There is only one thing forever: to

[17] LE K Architectures, In Vivo, *Architectural Design*, 07-08/1999, pp.85-87

respect and revere the precious miracle of the network of life, and express this in new spatial forms.

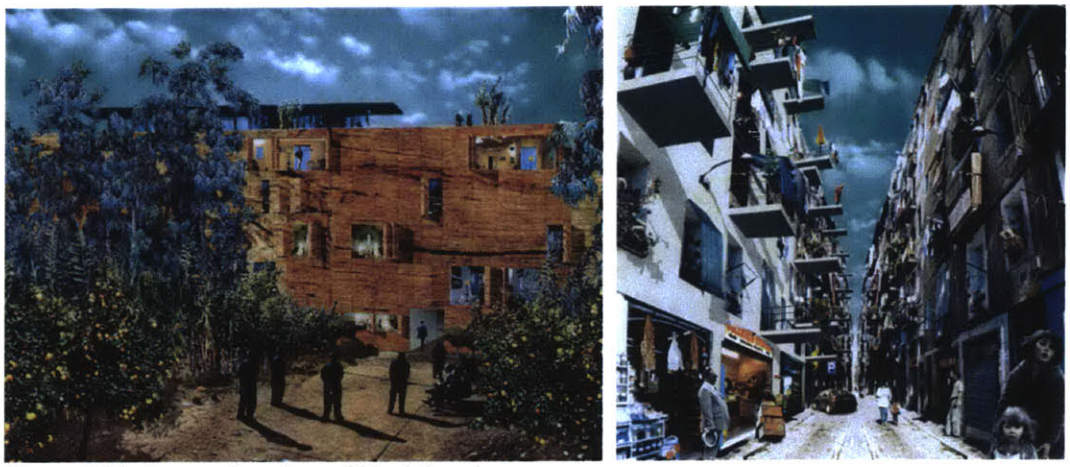

Figure 4-20: Perspective view of block housing
(Source: *Architecture design, 07-08/1999*)

4. Design with Social Changes: Yamamoto's Housing Projects in Japan

"...We ought to be able to make the present system more flexible by displacing architecture slightly from established categories or by making it possible for isolated facilities to relate to one another."[18]

After the end of World War II, the urban neighborhood forms changed dramatically in Japan within the period of 25 years (Figure 4-21). In 1945, most of the population still lived in the countryside, but by 1970 almost 70% of the Japanese population had settled within a narrow, urbanized strip along the plains of the pacific coast that could, in geographical terms, be easily developed. This happened during a period of extensive re-industrialization and modernization of the country. Necessities imposed from the outside brought about not only by the rapid

Figure 4-21: Tokyo in the 1990s
(Source: *Architecture culture, 08/2000*)

[18] Riken Yamamoto, Are Works of Architecture to Remain Facilities of Isolation, *Architecture Culture*, 08/2000, Seoul, pp.69.

economic expansion but also by political intent -- led to a radical and reckless rejection of the traditional form of living and its corresponding spatial expression.

The spatial and social deficits that accompanied this development became obvious only, with the collapse of the Japanese economic boom in 1992. Architects were suddenly confronted with a city that was reacting not so much to the needs of society as to marginal fluctuations of the economic climate, and that now -- deprived of a dynamic economy -- revealed a stunning lack of substance. That means that the city still is in a state of constant unfurling and realization, which doesn't really allow for any comprehensive planning.

In the past several years, with particular regard to the times of the "bubble economy" of the 1980s and early 1990s, Japanese architects produced a great variety of architectural experimentations in Japan. Among these architects, Riken Yamamoto stands out as not only one of the most creative and innovative designers, but also the one who has been, from the beginning of his career, most deeply concerned with the changing social and urban reality of Japan, and addressed this reality most consistently in his works. From his urban housing projects, one can, first of all, identify his persistent questioning of the dominance of a collective group over the individual, a condition that the majority of practices and governmental policies still maintain in urban development. Yamamoto favors a responsive system in which the individual has the liberty to freely associate with the society. This means an individual has the right and ability to control his or her own relationship with society. He believes the architect should foster a multiplicity of interactions, rather than only a one-way connection between the person and community or society. Yamamoto's sharp opposition to the prevailing authoritarian or top-down and rigid urban planning policies has led him to increasingly successful urban housing projects with the reform of the relationship between the overall neighborhood plan and its parts -- housing units.

The Hamlet (1988) in the center of Tokyo (Figure 4-22), where Yamamoto had to design a residential complex for four, related families, could be his first representative project. He provided each with its own dislocated private units -- themselves composed of well-identifiable discrete elements -- and then brought them together by way of flexible common spaces: shared circulations, shared terraces, and the softly curving

membranes of translucent "tent" structures. "It is the first time in Japan that Yamamoto's theory questioned the basic concept of a multiple dwelling that assumes a vertical or horizontal addition of identical units. Logically, it necessitates a different spatial arrangement. At the same time, Yamamoto is very aware of the fact that the radical break-up of the familial structure is an illusion that may not be desirable. Instead, he is looking in Hamlet for a possibility to expand the field of interaction for the individual through an opening-up of the spatial stipulations and, thus is looking to introduce a higher complexity into the planning. A solution was applied that offers a vertical separation of the units analogous to a familiar order as well as a horizontal dissolution of the compact apartment ground plan, which allows for a diversification within the family and introduces a generational order into the ensemble as a whole..."[19]

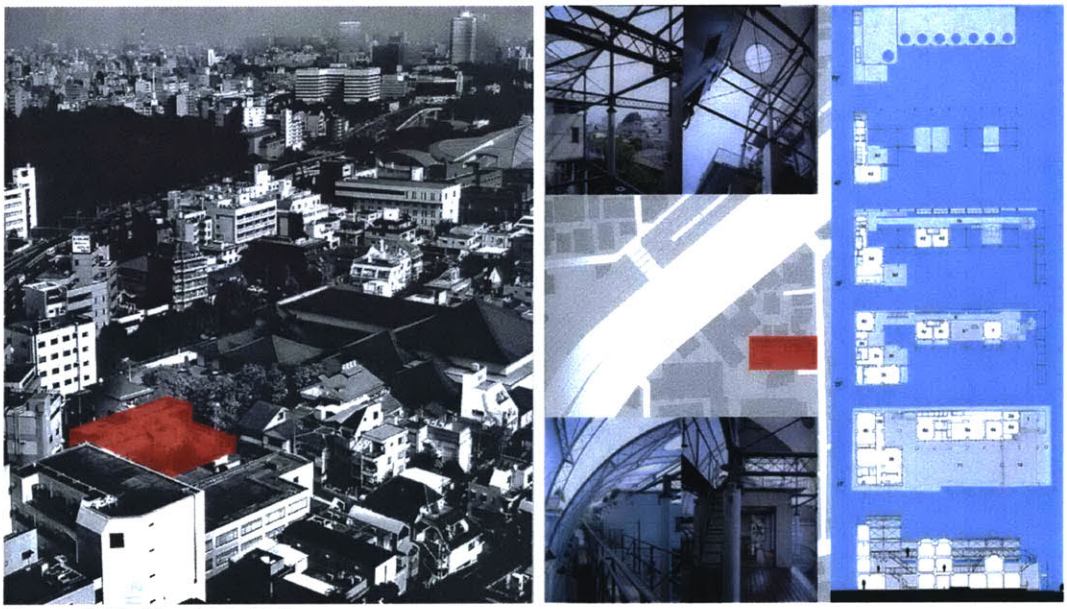

Figure 4-22: Hamlet in Tokyo
(Source: *Riken Yamamoto*)

Yamamoto distinguishes between the public and common realms as variable extensions of the private domain. Thus he organizes his architectural unit as a flexible system, where the individual, provided with his or her private existential space, can be in touch at will with both the public realm, the city or society at large, and with the common realm, such as the jointly used spaces of family members in a residence, or the space of the courtyard used only by the tenant families, in the case of an apartment complex. The

[19] Wilhelm Klauser, Family, *Riken Yamamoto*, 1999, Basel, Boston and Berlin, pp.36.

best resolution of this can be seen in Yamamoto's Hotakubo Public Housing (1991) in Kumamoto (Figure 4-23) and the Ryokuen-toshi Inter-junction City and town-center development (1994) in the outskirts of Yokohama (Figure 4-24). In these projects, Yamamoto devised a program and architectural resolution according to which each

Figure 4-23: Hotakubo Public Housing
(Source: *Riken Yamamoto*)

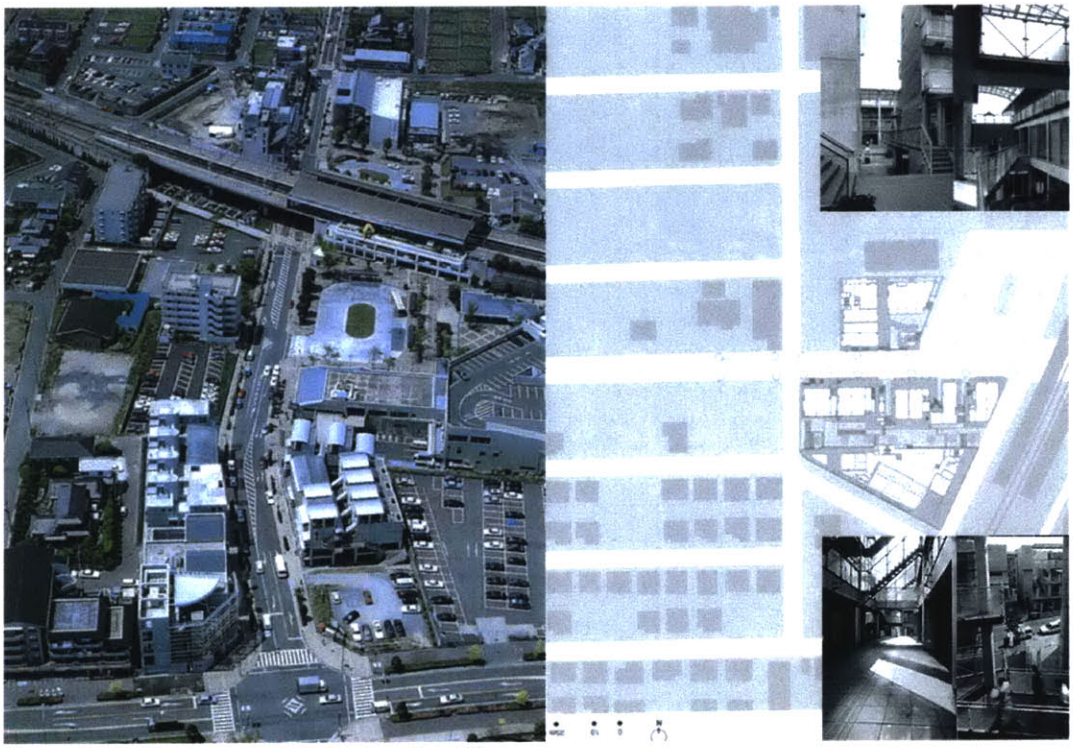

Figure 4-24: Ryokuen-toshi Inter-junction City
(Source: *Riken Yamamoto*)

individual residence was directly accessible from the outside streets, as well as each was individually connected to the enclosed spacious common courtyard. Here, to quote Tom Heneghan, "tenants retain their individuality, rather than being coerced into collectivism by any unrealistic, if benign, social idealism. And, again, although explicitly a contemporary work, the fragmentation of each dwelling into two distinct parts, linked only by a partially enclosed bridge, is reminiscent of traditional house-types familiar throughout the southern parts of Japan, while clearly being a radical proposition in the present day."[20]

Yamamoto's position regarding social issues represented the basic attitude of contemporary Japanese planners and architects. While modernist architects would promote the close, even one-to-one relationship between function and form, they approached both as largely independent entities with only a casual connection between them. Furthermore, rather than a group of utopian idealists, as a new kind of modernists, the new generation of Japanese architects were down-to-earth realists; in fact they were "social realists," as Yamamoto was sometimes called, who "rejected all authoritarian planning."[21]

The S project of A & B blocks (2000) was a large urban housing project in Tokyo, in which, cooperating with Toyo ITO, Yamamoto developed three 14-story slabs and two 9-story boxes for 2,000 residential units (Figure 4-25). Recognizing the huge scale of the project and traffic issues in this central urban area, Yamamoto and Toyo ITO leveled each building up to elevated circulation decks. In each building, common corridors were designed as streets to organize half-transparent living units. In these corridors, attractive qualities of spatial use and experience are evoked, as well as highlighted by the spaces both inside and out, such as the open terraces. Anybody who has seen the typical postwar housing estates (danchi)[22], and many other governmental residential projects since then -- based on the xLDK type planning with its rigid and spiritless design -- can really appreciate Yamamoto's achievements here.

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[20]Tom Heneghan, Aesthetic Surgery: Special issue on Riken Yamamoto, *Space Design*, 05/1995, pp.128.

[21]Tom Heneghan, Aesthetic Surgery: Special issue on Riken Yamamoto, *Space Design*, 05/1995, pp.130.

[22]The danchi were based on a typical plan -- which in addition to small tatami rooms included a living room, dining-kitchen and a basic bathroom -- denoted by 2LDK, 3LDK, etc.

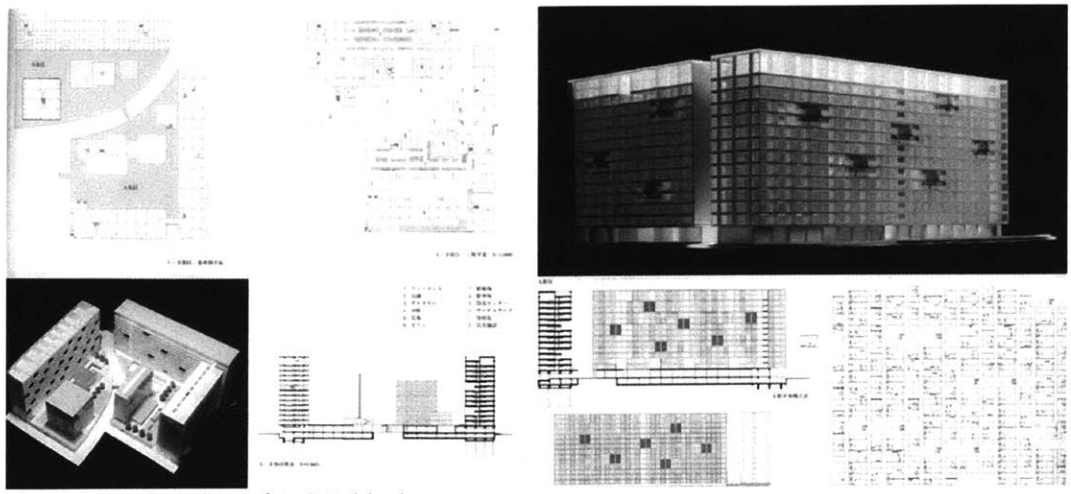

Figure 4-25: S project of A & B block
(Source: *Global Architecture Document, Japan, 11-12/2000*)

In contemporary Japanese urban neighborhood developments, an endless and monotonous suburbia has emerged that owes its existence to rather similar factors. The result has been a paradox -- an extremely heterogeneous urban landscape that has evolved in a society driven by "consensus" only with respect to its productivity, whereas the "individualistic" industrial societies in Europe and America have found a much more unified urban form of expression. The deep societal insecurity caused by this development presents itself as the essential problem of Japanese architecture. Because of enjoying highly sophisticated network of information and culture, and an affluence of commodities, people began to demand a wider range of choice in terms of living spaces to satisfy their needs for diverse and individual lifestyles, tastes and senses of value. From experience, Yamamoto and many other Japanese architects confirm that new spatial forms are necessary and possible in Japan today. Although people still have an intense desire to own detached houses and scarcely need or care for the joy of public space or community activities, society drives them toward new spatial forms of urban neighborhoods.

CHAPTER 5: PRACTICES IN CONTEMPORARY CHINA

1. Conservation and Infill

A contemporary neighborhood development project requires more than a narrow focus on producing houses to fill individual lots. Instead, a cooperative partnership with a broader focus of completing the existing community fabric is required. A variety of strategies have been successfully employed to make infill development happen. In projects such as the Ju'er Hutong courtyard housing project (Beijing, 1995), many fresh ideas have emerged from the process of re-examining existing codes and searching for more flexible ways to shape development. A creative combination of strategies will best accomplish significant gradual development. The package of strategies should both encourage developers and raise the desirability of organic-gradual development in the eyes of existing and potential residents. In many cases, these strategies will need to address the negative perceptions that many residents have about urban living. Concerns about safety, quality of education and quality of public and commercial services may need to be addressed, as well as concerns about design, finance and infrastructure upgrade. Certainly, the resources to promote organic-gradual development are limited, and the obstacles are sometimes daunting. In the long run, however, the costs of continuing to favor sprawl development patterns (to the public and private sector alike), will far exceed the resources needed now to facilitate organic-gradual development.

Case study: Kaiyuansi Historic District Conservation, Quanzhou, 1997-present.

Quanzhou is located in the southeast coast of China. There are some hills in northern and western parts of city; and the Pacific Ocean is on the southeast. The city was built in 906 AD. Between the 1200s and the 1600s, Quanzhou became the largest port of on the eastern hemisphere. Prosperous business gave the city commercial and cultural vitality. There existed a unique multi-religious culture, which included Buddhism, Taoism, Kongfuzinism, Islam, Monism and Christianity. During this period, the city continued to freely spread south and east. As a result, an irregular fabric was constructed and maintained until 1949. After 1949, a new part of city was built up at the east part of Quanzhou. Therefore, the old city fabric is maintained very well.

Although in 906 AD the city was built initially by a hierarchical system of grid net and with clear cross streets, it has since evolved into an ambiguous system. The river was a main factor that changed a regular system into an irregular one. Another main factor was the development of commercial and religions activities, which built up many mixed-use neighborhoods, which provided the city more complexity, more fashion and

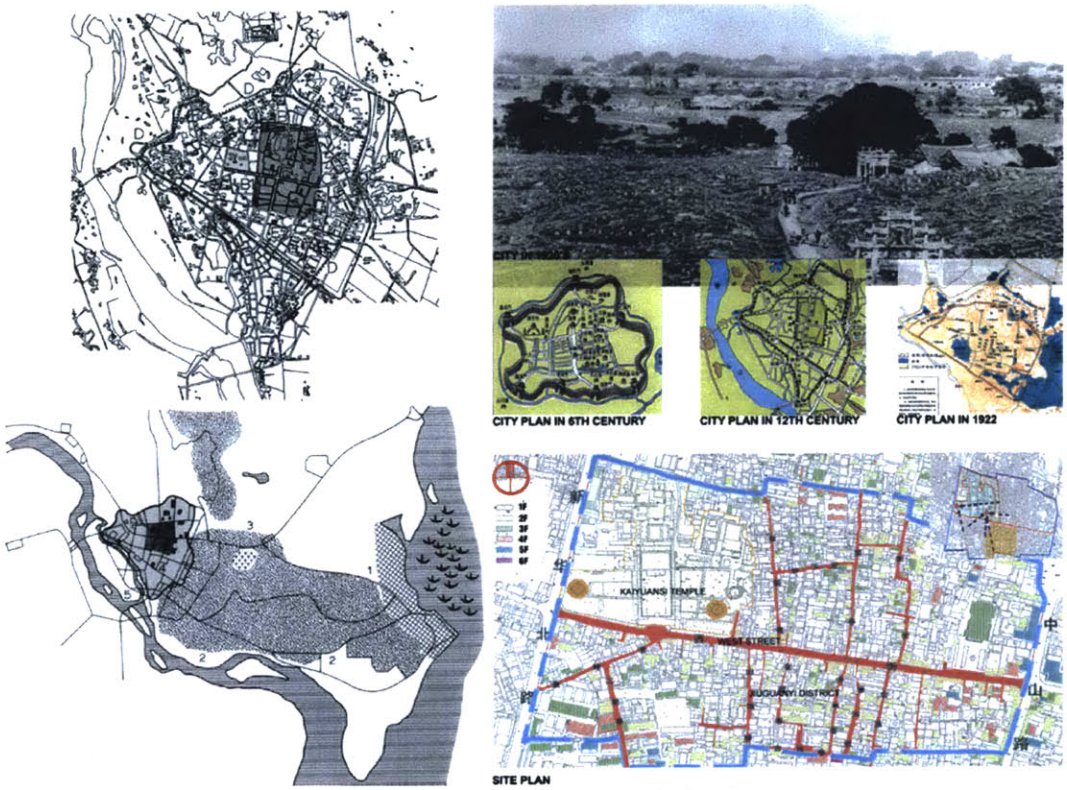

Figure 5-01: The map of Quanzhou city and Kaiyuansi neighborhood
(Source: Department of Urban Planning, Tsinghua university)

more activity than many other cities in China. The Kaiyuansi neighborhood was the biggest and most important (Figure 5-01). The project also was the first financed by the National Historic City Conservation Fund (1996). As the leader of design team from 1997-2000, I took part in all the design process.

The design began with investigation and database setup. In the investigation process, a method called InterSAVE was used and a database was set up. The database, connected with the GIS[23] of the city, became the base of master plan and building design, which included information regarding the political, social, economic and physical

[23] Quanzhou was one of the five cities in China that built up their own GIS at the beginning of 1990s.

environment, and the evaluations of existing districts, streets and buildings (Figure 5-02, 03, 04, 05).

Items	Amount	Ranking	Items	Amount	Ranking
Region land area (km^2)	10866	--	The population of the city	627,100	130
City land area (km^2)	530	--	The population living in the city	282,400	160
Core city land area (km^2)	18	209	GDP (billion US$)	150	62
Regional population density (/km^2)	598	--	Core city population density (/km^2)	1183	--

Figure 5-02: The basic information of Quanzhou (1998)
(Source: *The annual city statistics of the People's Republic of China, 1999)*

Land	Land area (hector)	Percent (%)	Average land area (m^2/people)
Resident	2.00	58.8	18.76
Courtyard and green land	1.07	31.5	10.04
Street and lane	0.33	9.7	3.10
Total	3.40	100	31.90

Figure 5-03: Land use

Name	Uses	Length (m)	Width (m)	Materials
Xijie Street	City road	735	8-12	Cement
Haogouqian Street	City road	767	6-10	Cement
Jiuguanyi Lane	District road	277	2-8	Cement
Jingtingxiang Lane	District road	380	2-5	Stones
Jingtingzhixiang Lane	District road	121	4-5	Stones
Jincaixiang Lane	District road	175	1-3	Stones

Figure 5-04: Street and lane

Number	Units	Families	Public owner	Private owner	Populations
Xijie 117-207	45	92	0	92	330
Jiuguanyi 10-151	49	60	2	58	276
Jingtingxiang 49-80	41	65	7	58	220
Jincaixiang 1-10	14	28	4	24	109
Gongchan 1-2	2	35	35	0	131
Total	151	280	48	232	1066

Figure 5-05: Family and population

Traditional characteristics and residents' requirements were the deciding factors in the final design (Figure 5-06). Designers first provided a primary comprehensive plan and a schedule for construction. Governors, developers, most importantly, residents took part in the discussion of the plan and schedule. From the discussion, we learned that, on one hand, residents urgently wanted to improve their life quality, to some extent; they desired new life standards: health, comfort, and modernity. On the other hand, no one wanted to lose the familiar characteristics of their neighborhood, including fabric, space, scale, and performance -- in a short, the traditional cultural atmosphere. Living in that

atmosphere, every one could clearly tell visitors every story in every corner of their neighborhood.

Figure 5-06: Traditional spatial elements

Four main characteristics of spatial forms exist in the buildings of the neighborhood: (a) continued wall, which was a completed closed boundary that isolated the house from streets (public space); (b) courtyard, which was a private open space; (c) main house, which was another private open space and always faced to courtyard; and (d) other houses, which were pure private spaces connected by corridors and courtyards. Especially in terms of construction and materials, the neighborhood represented a "red brick culture," because it was located in the center of one of the areas in china that most typically uses brick and stone -- some expensive materials in other areas -- to build residential houses. Due to the unique quality of the soil, bright red brick and tile, along with grey stone and wood, built up a famous "red brick cultural area." To maintain and develop these spatial characteristics, four methods were used in the design process (Figure 5-07):

i) Strengthen spatial identities and maintain the hierarchical order of streets, block scale, building height and color, etc.

ii) Reuse brown fields and other already disturbed areas, create adaptive open public space, reconstruct infrastructure system, and provide modern interior design for housing.

iii) Evaluate existing buildings, streets and other site amenities, protect important historic buildings and repair commercial shops along the street to infill new energy for redevelopment.

iv) According to requirements of conservation, reuse existing buildings and structures whenever possible, use different methods, such as restoration, adaptive modification and rehabilitation, renovation, rebuilding, and reconstruction to attain the goals of infilling development.

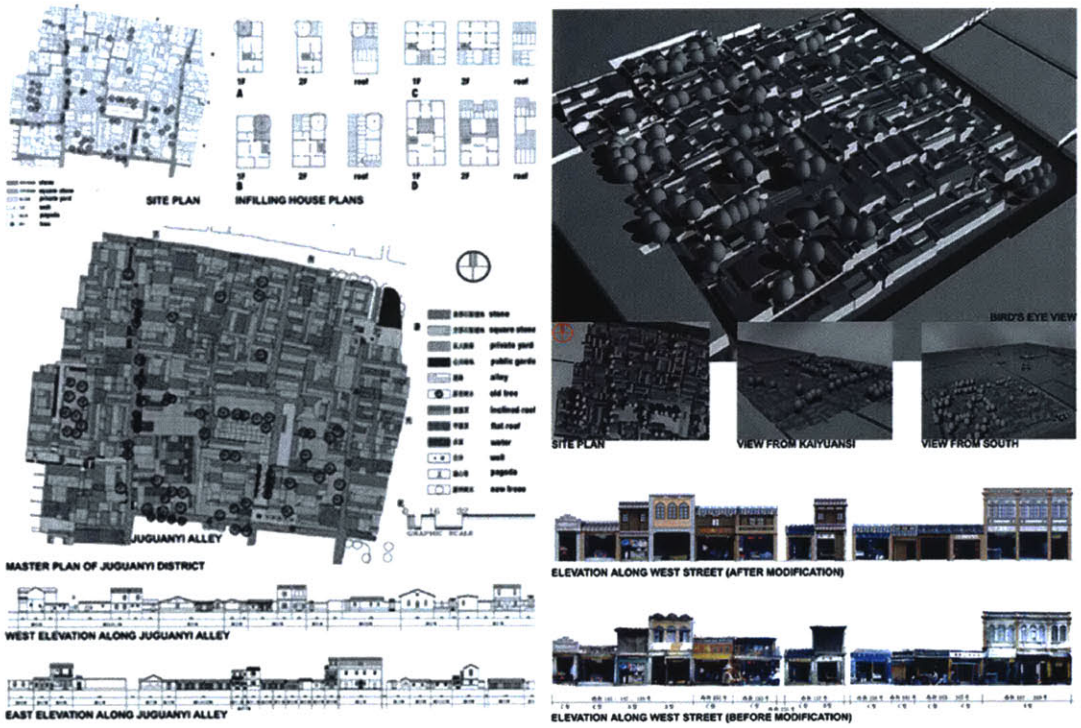

Figure 5-07: Design scheme

For infill development, it was important that, from the beginning, residents, specialists, developers and governors worked closely and communicate frequently in conferences, by phone, and on the Internet. In the design process, a united team cooperated to analyze the information, gave some possible solutions and developed design schemes. An authority office organized by local government made the final decision, and also took control of the budget and adjusted the application schedule. Although it was impossible to satisfy everyone, a democratic attitude and a highly efficient specialist-system kept dissatisfaction to a minimum and balanced benefit attributions (Figure 5-08).

	Floor area (m^2)	%	Floor area (m^2)	%
Restoration	7615	38.0	10500	34.8
Rebuild and reconstruction	1645	8.2	3150	10.4
Strict protection	3899	19.4	5172	17.2
Adaptive modification and rehabilitation	2259	11.3	4124	13.6
Infilling development	1170	5.8	1755	5.8
New construction	3459	17.3	5514	18.2
Total	20047	100	30215	100
FAR before planning: 1.38	FAR after planning: 1.50			

Figure 5-08: Information after planning

2. High-rise Tower

The high-rise tower is a unique characteristic of modernity. It seems that no one really likes it except developers, since the high-rise tower only gives us an impression of high density. In reality, it is less successful than other spatial types. However, the high-rise tower is an important type that cannot be overlooked in shaping neighborhood spatial forms. In China, every day one or two new high-rise towers are built (Figure 5-09). Sometimes entire neighborhoods are comprised of high-rise towers. We already know how ugly these tower have been in the past, but currently, working with architects, some developers are attempting to create more attractive neighborhood spatial forms based on the high-rise tower. One example is an on-construction project in Beijing, Jian Guo Men Wai Small Office Home Office (Jian Wai SOHO), which is a entire high-rise tower neighborhood, developed by a prestigious real estate firm -- Red Stone Real Estate Group, and designed by Riken Yamamoto, a Japanese pioneer architect. The next paragraph represents the developer's own initial idea of this project:

Figure 5-09: SOHO Modern City in Beijing
(Source: http://www.panshiyi.com)

"When I was young, there weren't any cars on the streets of Beijing. We either walked or rode bikes to travel around the city. Back then; it was not at all unusual to see horse drawn carts carrying loads of cabbage strolling by. There weren't really any cars, there wasn't much dust or pollution, and the streets were safe and lively. Life extended from home to the streets. My memories of that time are filled with images of children

playing on the street after school, older folks sunning themselves on the promenade, shy young lovers - careful not to let their hands touch - taking slow, romantic strolls down the streets.

Then about ten years ago when I was living in New York, I still had a passion for street life. My favorite meandering ground was Soho, with its narrow streets, jostling crowds and labyrinths of small shops and stores. In fact, that is where the true charm of Soho lies: in its very smallness. It can be found in the tiny storefronts of famous designers, little museums and small cozy restaurants. One gets the sense that there is something beneath the surface, hidden in the small corners, waiting to be discovered."

Riken Yamamoto explains his master plan for Jian Wai SOHO as a plan of streets: "14 narrow winding lanes, four to six meters wide. A stroll on one winding lane reveals a very different visual experience from straight, traditional roads. Walk to the end of the lane and turn to look behind you, you will discover that the houses, the trees and the people you have passed along the way have faded, become faint and indistinct. This creates a sense of gradation, of mystique...and an emphasis on the steps taken along the way." Along these winding lanes (Figure 5-10), Yamamoto has designed a series of

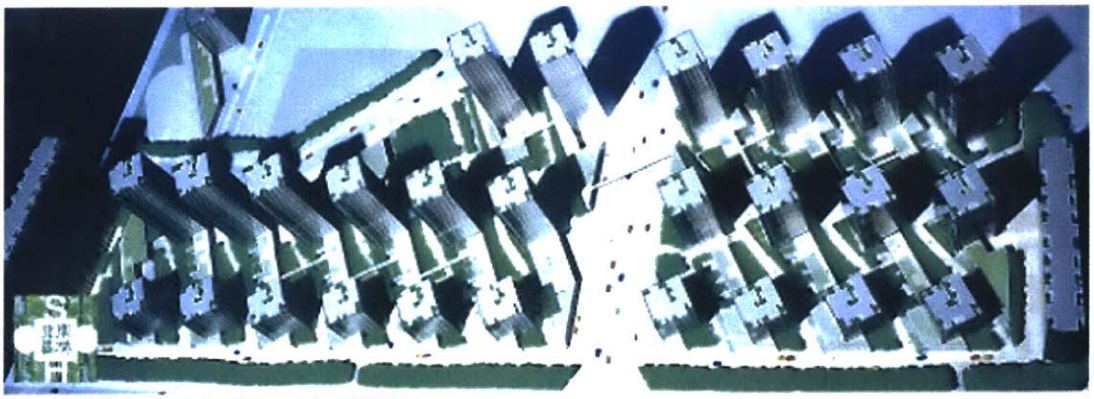

Figure 5-10: Model of Jian Wai SOHO
(Source: http://www.panshiyi.com)

scattered and irregular little clearings, squares and gardens, all facing in different directions. Therefore, Jian Wai SOHO provides its residents with their very own streets. These private streets, rising above the noise and bustle of the city below, solve a very difficult problem -- how to create a connection of indoor life and outdoor life among high-rise towers. They are clean, safe and tranquil, connecting to the lobbies on top of each 3-storey building, accessible only to the residents, not accessible from the streets

below. Filled with narrow footpaths and small, ornately wrought footbridges, which can be seen as the second layout of private streets, the rooftop garden solved another difficult problem -- how to create some open spaces that people can easily reach from their high-rise towers (Figure 5-11).

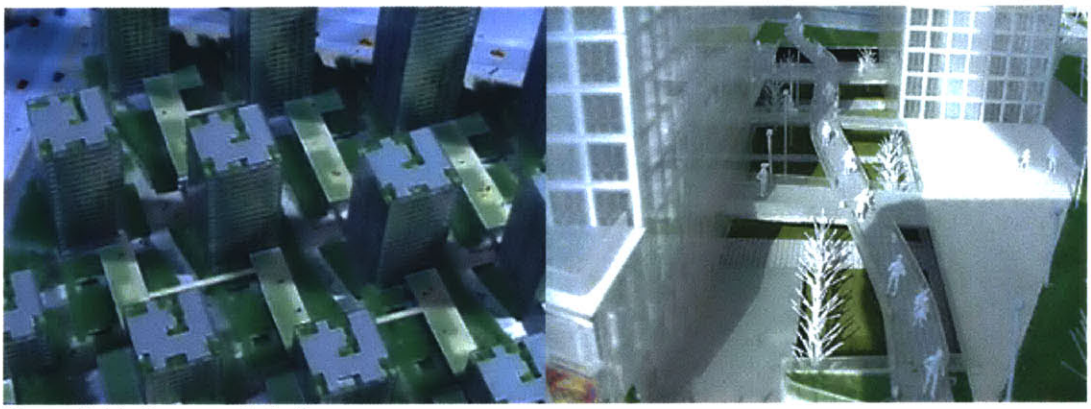

Figure 5-11: Lanes and platforms
(Source: http://www.panshiyi.com)

The monotony and noise of busy urban life can cause people to feel lonely. People's daily life is about rushing from apartments to elevators, from elevators to cars or buses, back and forth day after day. Urban neighborhoods should become tools to release the heavy burden of citizen's spirit. Yamamoto wanted to bring sunshine and breeze into people's daily life, so he created a series of open-air sink-in gardens in the first basement parking floor (Figure 5-12). These gardens, taking their visual cues from the tree-lined

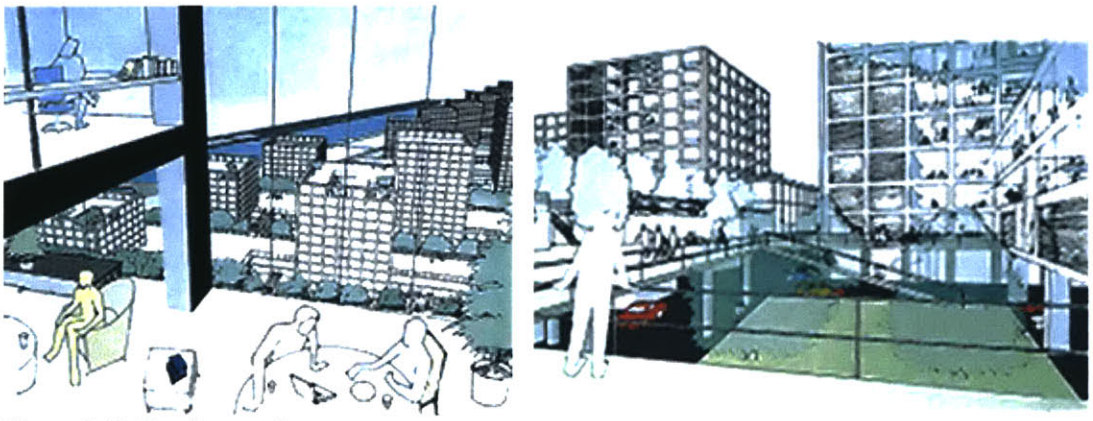

Figure 5-12: Rooftop garden
(Source: http://www.panshiyi.com)

streets outside, manage to transform what would otherwise be a dark, gloomy parking garage into a spacious oasis of light. The fourteen lanes on the third floor are a flourishing, vital part of the city center, along which can be found shops, restaurants,

offices and homes. Furthermore, there are no restrictive walls in Jian Wai SOHO. Steel and glass bring residential units into the open. "We all like to watch the others and to be watched."[24]

For centuries the city planning of Beijing has had one principle: the center is reserved for the highest commanders of the country, and the city grid hence is positioned with an axis which runs south and north, and the buildings all face the south. At Jian Wai SOHO, Yamamoto has turned all the buildings an angle of 30 degree eastward (Figure 5-13). This clever move enables all the residents to enjoy direct sunlight and to avoid

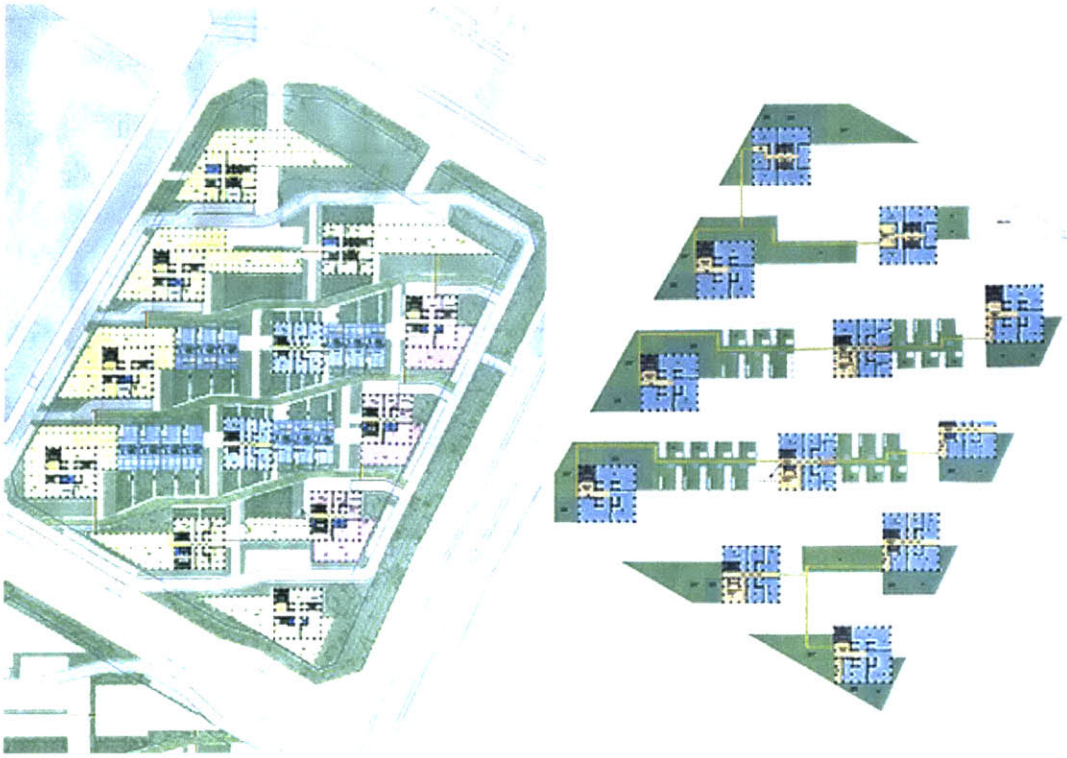

Figure 5-13: Floor plans
(Source: http://www.panshiyi.com)

eternal darkness in the shadow caused by facing north. All of the unpleasant angles are gone, allowing one's vision to travel unfettered to the distant horizon. Through windows, residents see not only the vast sky, but also the beauty of Jian Wai SOHO's stylish skylines. There is no longer the embarrassment of looking directly into your neighbors' apartments. With the 30-degree movement, instead of the four sides, it is the four corners of each building that face straight north, south, east and west. The three apartments on

[24] http://www.panshiyi.com

one floor enjoy the sunshine, the views and the privacy of each corner from east to west. Even the common living space and elevators positioned at the north corner are lit up by the sunrise and the sunset.

The slender lines of the buildings not only give Jian Wai SOHO an elegant appearance, but they also serve two essential functions. First, they increase the building distance, to allow gaps between buildings up to 40 meters. Second, they reduce the number of apartments occupying each floor so that all families can enjoy more sunshine, more views with longer frontage of the building. By taking up a 90-degree corner, each family has two sides of glass walls. Each building is sized 27 x 27 meters, covered by glass exterior walls. This reduces the heaviness of the building. In the daytime, they are transparent under the sun, while in the evening the many lit-up buildings become a cluster of light boxes (Figure 5-14).

Figure 5-14: View of model
(Source: http://www.panshiyi.com)

On one hand, Jian Wai SOHO provides overwhelming layering of the skylines with 14 winding streets, 3-storey rooftop space and underground streets illuminated by sink-in gardens. It attempts to create a new hierarchical system of streets by developing and broadening the spatial concept of the street, one of three basic spatial elements in traditional Chinese urban neighborhoods. On the other hand, since the courtyard has already lost its social soil and also because it is very difficult to let sunshine into a courtyard surrounded by high-rise buildings, Jian Wai SOHO forgets this form and focuses more on housing unit spatial design itself. Generated from the popular modern life standards in China, the housing design fully reflects the market demands. At a rate, the developer and architects are conducting some further research in that direction.

3. Collective Housing and Residential Cluster

Originating from the1920s, collective housing (or apartment buildings) have become the central theme for architects, who even seem to have felt it their mission to propose a model prototype of spatial forms. In fact, collective housing is a very flexible and helpful concept used in constructing an urban neighborhood. Since it contains all the

necessary characteristics of an urban neighborhood, it not only can be seen as a basic unit of the neighborhood, it also can be seen as a micro-neighborhood.

The concept of the residential cluster stems from understanding the relationship between neighbors. Some research into living environments shows that most resident activities occur within housing clusters and that frequent communication between neighbors contributes to a strong relationship, which is in turn beneficial to the general psychological welfare of residents and to the management of residential areas. In China, the earliest modern collective housing was from Shikumen housing, Shanghai, in the 1930s (Figure 5-15). Because clustered houses can avoid disturbing large areas, limit road construction and service corridors, and provide high density, residential clusters quickly became the major format of Chinese urban neighborhoods.

Figure 5-15: Sikumen housing in Shanghai, 1930s
(Source: *New China buildings*)

Case study I: Block Housing - Dongsishitiao District, Beijing, 1993

Here I would like to show a collective housing unit that I and the other two partners [25] designed for the AIA housing competition in 1993 (Figure 5-16). It was located in the Dongsishitiao district, one of the 24 historic preservation districts in the inner city of Beijing. There is a series of strict rules to control construction. For example, the height of the buildings can not be more than 24 meters, with a ratio

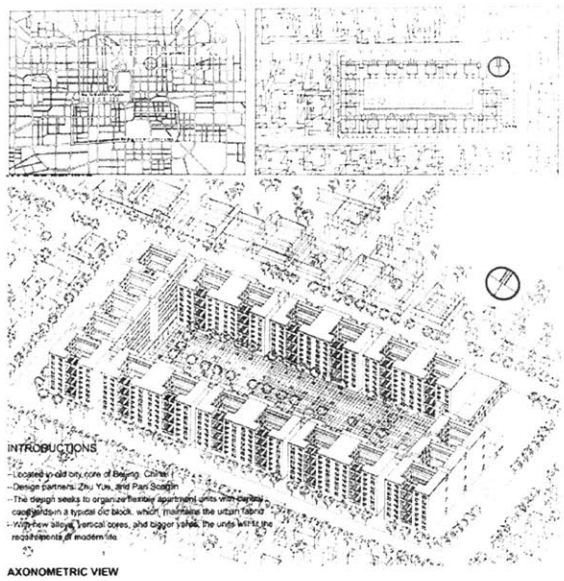

Figure 5-16: Dongsishitiao block housing

[25] Design Partners: Zhu, Yue and Pan, Songlin

of sunlight penetrating no less than 1.6 and a south-north facing direction, etc.

We chose a typical block to develop block housing. The first idea is to seek to keep a finger on the pulse of new developments in domestic lifestyles and working environments as well as the pursuit of innovation in residential architecture. We tried to create some inner streets with flexible housing type to fit most requirements. We devised a scheme, in which the modular units can form different apartment types situated across a common passageway and a series of small courtyards. Such a modular system allowed for the free expansion or combination of any new space, which could be residential or utility. Moreover, following the ensuing signs of shifting priorities in use, we reversed the hierarchical relationship between living and "service" spaces. Well-appointed living rooms, bathrooms and kitchens were organized along the outside facade with windows, while other areas in flexible arrangements followed them further inside. Wherever possible, the partitions between these spatial units were of traditional building materials -- blocks, and traditional spatial form -- courtyards. The buildings were also designed with numerous in-between common terraces of double height. We attempted to see the houses as tools through which society can adapt to the new conditions (Figure 5-17).

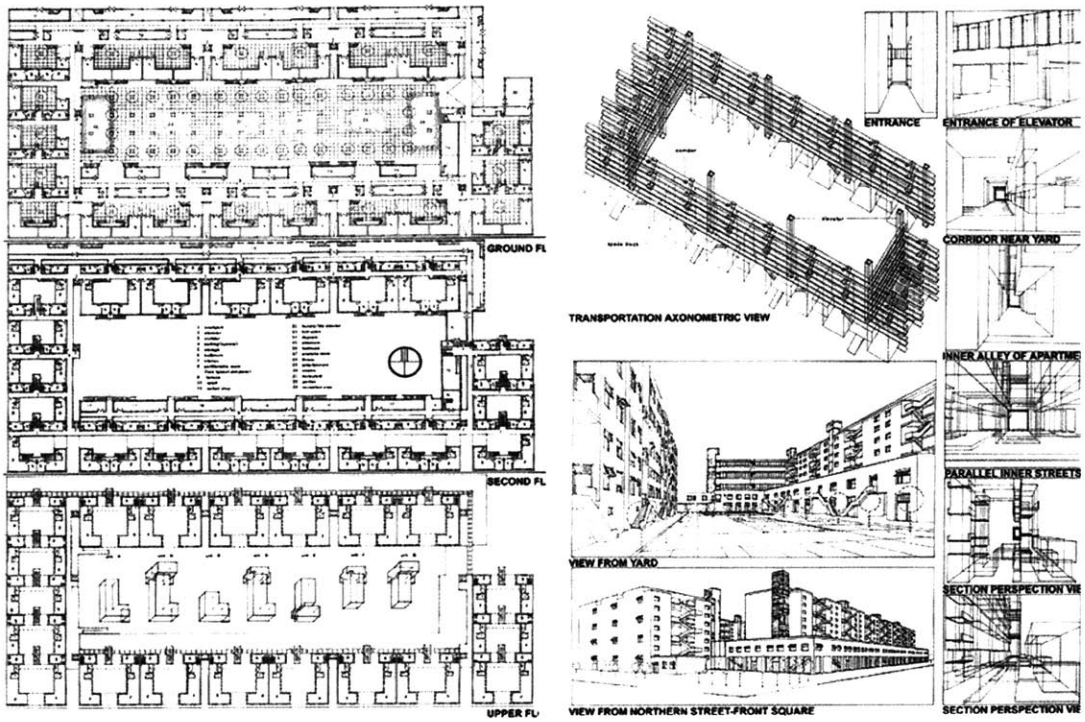

Figure 5-17: Plan and perspective view of Dongsishitiao block housing

Case study II: Hybrid Cluster - Nanshi District, Tanjin, 1998-Present

Total buildable area: 210,000 square meters (140,000 for residential area)

Total number of apartment units: 1,200

The Nanshi District is located in the core city of Tianjin, the seventh biggest city in China (Figure 5-18). This was a typical urban neighborhood redevelopment project in the late 1990s. Government, developers and residents all sought an active commercial environment, a high FAR, and the so-called Continental European style. Under the national standard that was called "A Guide to a Model Comfortable Housing Area," different building types, such as high-rise towers, mid-rise slabs and low-rise collective housings, were grouped according to potential market demands (Figure 5-19). There were two functional areas in this design. The east part consisted of commercial complexes combined with luxury apartments, which were located closed to

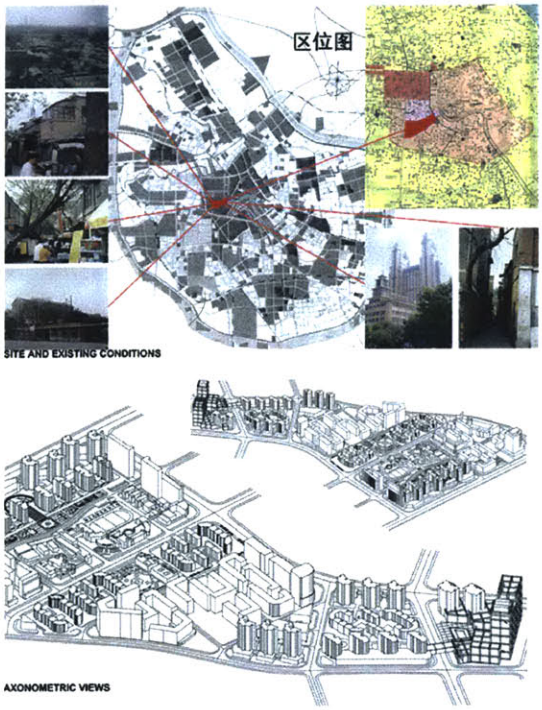

Figure 5-18: Site map of Nanshi District

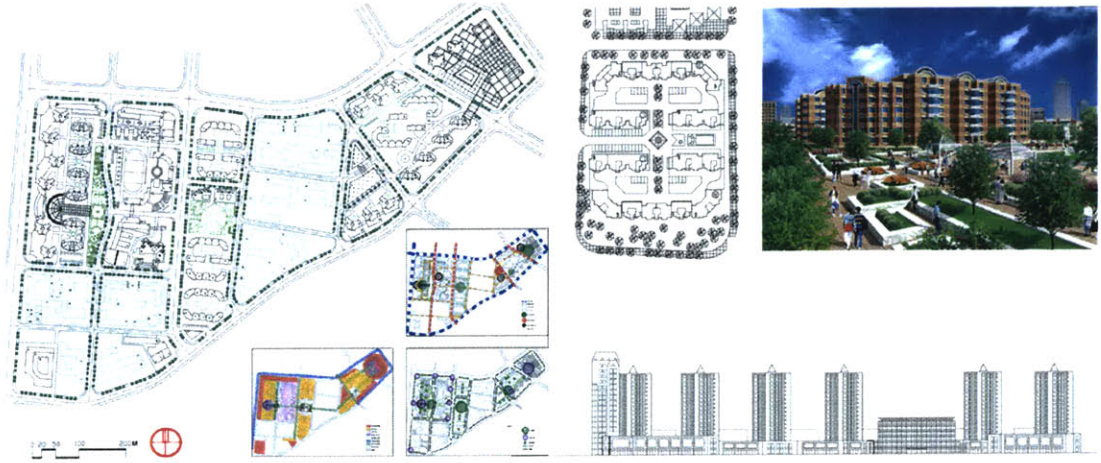

Figure 5-19: Design scheme of Nanshi District development

the commercial core of the city. The west part was the mid-class apartment and affordable housing clusters, which surrounded parks, schools and community center. The problem was that those high-rise towers were harmful for the continuity of the city fabric and the traditional spatial characteristics of city. The design did not provide some efficient communicative methods among high-rise towers, and also no consideration of the different classes. In other words, the design only considered the basic functional and spatial requirements of a modern urban neighborhood, but did not explore further on the social and cultural requirements.

Case study III: New Ideas - Sustainable Housing in China[26], 1998-Present

"By 2004, homes in China may consume as much as 10% of the world's total energy output. With the rapid growth of the Chinese economy, increased efficiency of energy use in China is an important element in a strategy to achieve sustainable world development. As energy usage becomes more expensive, and the damage of inefficiency more apparent, these strategies for energy efficiency will become more appealing to Chinese builders and consumers."

From 1998 to 2001, through four projects in Beijng, Shenzhen, and Shanghai, the research of sustainable housing in China provided us with a series of sustainable design strategies for the future Chinese urban neighborhood development as below:

i) Designers worked with governors and developers to control the cost of the development close to current buildings under construction, use and improve local materials and construction techniques, and design buildings according to local climates and culture.

ii) Designers' approach to design of urban neighborhoods involved the integration of technology and design issues: designers and engineers worked together on all stages of design to ensure buildings were analyzed as an integrated system composed of smaller subsystems, such as site, enclosure, mechanics, materials, energy consumption, and interiors.

[26] Http://chinahousing.mit.edu. 1998-2001, Collaboration: MIT, ETHZ, ETHL, University of Tokyo, Tsinghua University , and Tongji University.

iii) Designers used advanced technical tools for predictions and evaluation, such as using DOE 2, Phoenics and Lightscape to predict energy values and compare design schemes, using Computational Fluid Dynamics (CFD) to design for natural ventilation, and so on.

Conceptual Design of Huilongguan Residential Area, Beijing, 1998-2000

Total buildable area: 148,000 square meters

Total number of apartment units: 1,500

Collaborating with developer-Tian Hong Development Group, MIT and Tsinghua University provided a portion of a large suburb neighborhood development (Figure 5-20). For the generally cool climate, the primary design strategy was to reduce energy consumption in buildings by decreasing heat loss due to infiltration in the winter, increasing the amount of solar gain in the winter, and secondarily to optimize natural

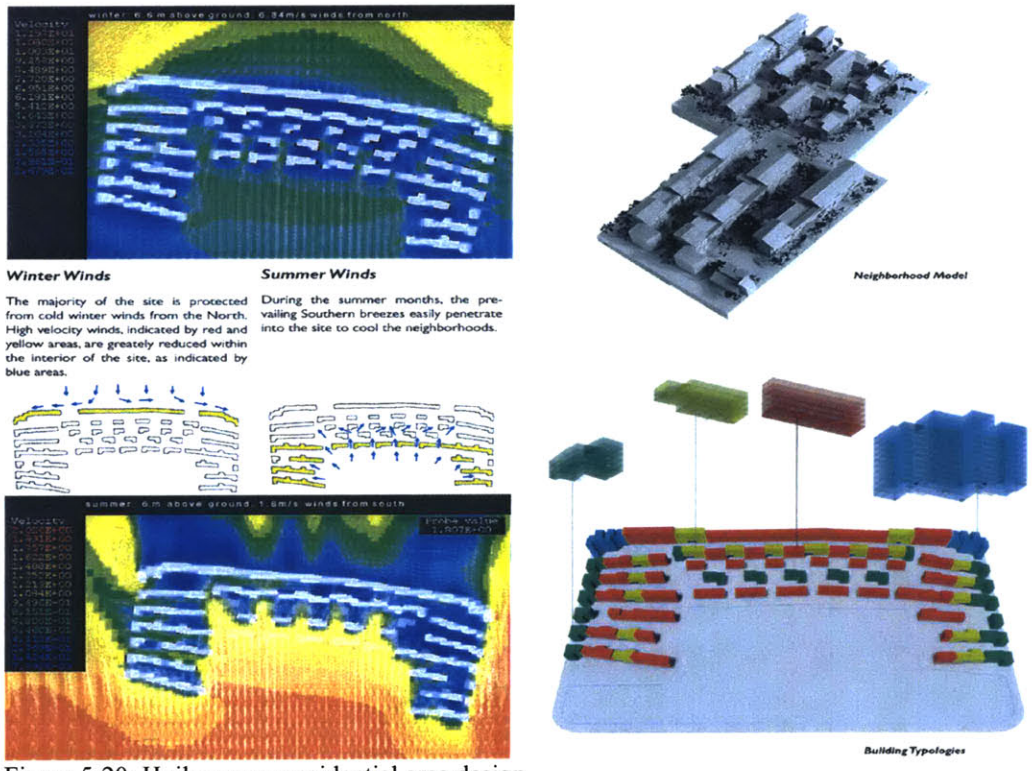

Figure 5-20: Huilongguan residential area design
(Source: *Sustainable housing in China*)

ventilation for the hotter summer months. The development group specifically requested a project with an emphasis on ecological, environmental and economic sustainability. The design team was particularly interested in the request that the "human element" and

its relationship to principles of sustainability were demonstrated. This project also explored different aspects of Chinese culture might intersect with these principles in the form of communal gathering and activity spaces, and the overlap of the built and natural environment.

Conceptual Design of Vanke Wonderland Phase IV, Shenzhen, 2000

Total buildable area: 30,204 square meters

Total number of apartment units: 258

This design maintained the same FAR (2.5-3) of typical developments but distributed it in a more cost-effective, environmentally and socially conscious way by using lower buildings at higher density. A series of small, intimate courtyards provided visual and physical access to outdoors for residents. The plan provided diversity of building sizes and types while juxtaposing units of different size and character within individual buildings. Natural airflow and solar considerations determined in part the placement of buildings on the site. In the year-round hot and humid climate of Shenzhen, the building orientation provided a high level of north-south exposure to maximize winter solar gain and summer shading (Figure 5-21).

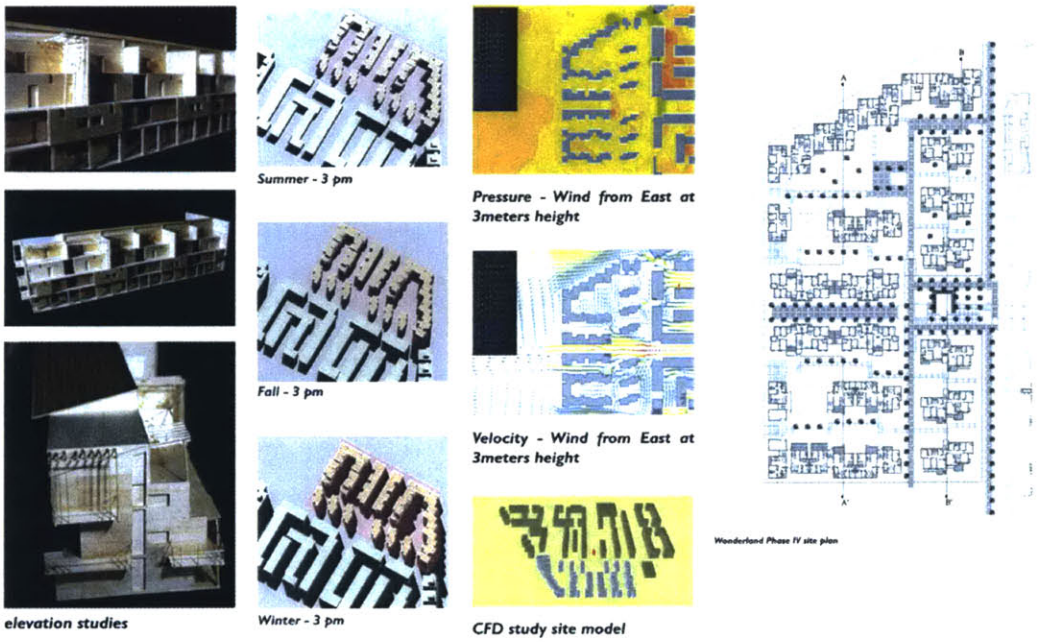

Figure 5-21: Vanke Wonderland phase IV design
(Source: *Sustainable housing in China*)

CHAPTER 6: TOWARD NEW SPATIAL FORMS

Although significant barriers to traditional Chinese urban neighborhood development are emerging, the changing nature of today's society provides an expanded market for new types of Chinese urban neighborhood development. In addition, recent legislation provides new support for neighborhood development, including compact development, alternative transportation modes, and more flexible land use regulation. Theories and practices also have begun to contribute to the solution of the myriad problems associated with sprawling land use patterns. They support increased transportation choices, use land and build infrastructure more efficiently, provide more varied and affordable housing types, save local government budgets, reduce pollution, increase economic vitality, and improve quality of community life.

1. Five Characteristics of Modernity

From theory and case studies, five characteristics of Modernity can be abstracted that should determine the spatial formation of future Chinese urban neighborhoods. They are: Accessibility, Intensity, Adaptability, Flexibility, and Humanity.

Accessibility

A new transit system should be created, which is sensitive to the traffic requirements of the time. This system will focus on the relationships among the different levels of access methods and alternative transportation modes, according to different location and site characteristics. For Chinese neighborhoods, multiple choices of accessibility are particularly important, because most of the residents do not have their private automobiles and thus depend on others for transit. For instance, the young are able to walk or bicycle to school and to other actives, freeing their parents from the responsibility of transporting them; and adults are able to bicycle or take buses to their work sites and to other actives, reducing the jam of freeways and highways. A new transit system should include the following characteristics:

i) The street layout shall be a modified grid street pattern adapted to the topography, city traditional fabric, and unique natural features.

ii) A minimum of two inter-connections with the public system rated as an arterial or collector shall be provided for a neighborhood.

iii) Linkages to adjacent developments and neighborhoods with pedestrian and bicycle paths are required where possible. An interlinked network of pedestrian walkways, which include bicycle paths, is a basic design feature. Along the pedestrian walkways, services, facilities, and jobs can be provided.

iv) Streets can have a maximum length of 600 feet (200 meters), from intersection to intersection, and to the greatest extent possible, continue through an intersection, or terminate in a "T" intersection directly opposite the center of a building, an internal open space area or a view into a peripheral open space.

v) The street layout in a neighborhood shall incorporate a hierarchy of street types, which includes lane and alley, one-way street, two-way street, two-way street with bicycle lane, main street (commercial/mixed-use street) with bicycle lane, boulevard with two-way bicycle path, and two-lane arterial with optional breakdown lane and bicycle lane (Figure 6-01).[27]

	Right-of-way (feet/meters)	Build to line (feet/meters)	Speed (mph/kmph)
Lane and alley	10-20/3-6	3/1	10/15
One-way street	30-40/10-12	6-12/2-4	15-20/25-32
Two-way street	50-54/15-16	12-15/4-5	20-25/32-40
Two-way street with bicycle Lane	60/18	15/5 (with bike lane)	25/40
Main street with bicycle lane	80/24	6/2	25/40
Boulevard with bicycle lane	92/28	20-25/6-8	25-35/40-55
Two-lane arterial with optional breakdown lane and bicycle lane	66-90/20-28	34-50/10-15	45-50/70-80

Figure 6-01: Streetscape of basic street types

vi) The modified grid block length ranges from 200-400 feet (60-120 meters). As the basic structural element of the network, it allows a multitude of positive visual and spatial occurrences. The block is generally a rectangle, a modified rectangle, or another distinct geometric shape.

[27]As not all the street types are appropriate for every neighborhood, designers should choose some of them as appropriate for the specific community.

vii) The community central common green space should be within 1500 feet (450 meters, 5 minute walking distance) of 90% of all dwelling units in the development. This means that a boundary of a community can be decided by a 1500 feet (450 meters) radius from the outermost boundary of the community center (Figure 6-02).

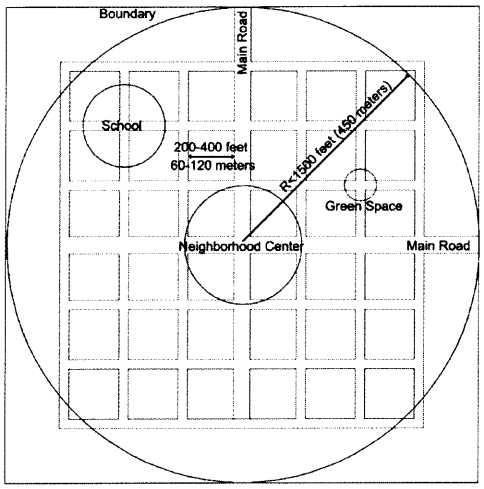

Figure 6-02: Scales of an ideal neighborhood

Intensity

Intensity means permitting adequate densities to ensure that new development is feasible and profitable, including providing for subtle density increases where sensitive compatibility issues exist, maintaining average densities by allowing density transfer from protected areas, and using density bonuses to stimulate infill development in target areas. As a comfortable high-activity neighborhood is more easily attains sustainability, according three typical development types, we can give recommended characteristics for neighborhoods as below (Figure 6-03).

	Infill Development Neighborhood	Residential Cluster Neighborhood	High-rise Tower Neighborhood
Area (acres/hectares)	7.5-17.5/3.0-7.0 (x 5-10)	6.5-12.5/2.5-5.0 (x 5-10)	5.0-8.5/2.0-3.5 (x 5-10)
Dwelling Units	500-700 (x 5-10)	700-1000 (x 5-10)	700-1000 (x 5-10)
FAR	1.0-2.0	2.0-3.0	3.0-4.0
Housing Storeys	2-4	5-7	8-30
Population	1600-2300 (x 5-10)	2300-3200 (x 5-10)	2300-3200 (x 5-10)
Open Space Ratio	0.20-0.30	0.35-0.45	0.40-0.50
Public Open Space Ratio	0.05-0.10	0.05-0.10	0.05-0.10
Civic Space	12 S.M./D.U.	15 S.M./D.U.	15 S.M./D.U.
Green/Common Space (min)	8 S.M./D.U.	10 S.M./D.U.	10 S.M./D.U.
Local Retail	2.5-5.0 S.M./D.U.	2.5-5.0 S.M./D.U.	2.5-5.0 S.M./D.U.
Modal Split (auto: others)	10:90-30:70	30:70-50:50	20:80-40:60
Waters	Private Wells/ Regional Supply	Regional Supply	Regional Supply
Sewage	Community Treatment/ Regional Supply	Regional Supply	Regional Supply

Figure 6-03: Recommended density characteristics for neighborhoods

In China, the law stipulates that "the neighborhood committee is a grass-roots non-governmental organization for residents to manage, educate and serve themselves," and "in accordance with the living conditions of the residents, the neighborhood committee is generally set up with 100-700 households based on the principle of management convenience." That is the reason why the form of a neighborhood is naturally combined with the management method. Generally, a housing cluster comprises 500-700 households and a neighborhood is made up of several housing clusters. In addition, the space is equally divided for each housing group by the roads within the area. Thus, several housing clusters surround a public open space, which, particularly in pilot schemes, generally occupies ten to twenty hectares of land and is suitable for division among four housing groups, prompting some people to say, jokingly, that this arrangement is like "four dishes and one soup."

With new modes of area management appearing continuously, especially with specialized real estate management companies adopting advanced management techniques, the intermediate level of management service can be reduced and a high level and efficiency of real estate management can be realized. Under such circumstances, the former mode of housing clusters is not needed. Besides, it has proven impossible for a single planning mode to exist in circumstances of continuous development and, consequently, the planning of high-standard residential areas has broken through the functional and conceptual limits of the housing cluster, allowing the formation of outdoor space to play a more prominent role; more specifically, by not being restricted by the scale of a housing cluster, both the layout of buildings and the distribution of public spaces are freer, and can be deployed to make distinctive arrangements in conformity with the surrounding context.

Adaptability

Adaptability means to choose right plan mode for special infill situations, land use and resident self-development, including providing for planning variances, and using flexible performance standards that emphasize outcomes. No other action of the designer can achieve an improvement in the availability of housing for mixed classes comparable to the sensible organization of a good neighborhood plan. A good neighborhood plan should include have the follow characteristics:

i) Modern urban neighborhoods need a mix of activities: dwelling, shopping, working, schooling, recreation, and worship.

ii) The neighborhood plan structures its streets and blocks to create a hierarchy of public spaces and locations for public buildings, as well as squares and streets have their size and geometry defined by the intention to create special uses.

iii) Public spaces and buildings represent community identity and foster civic pride. The neighborhood gives priority to public space and to the appropriate location of civic buildings. Public buildings occupy important sites, overlooking a square or terminating a street vista.

iv) A development suitability analysis must precede the sitting of any development. Not only will geology, certain soil and topographic conditions, and water supplies limit development, but also visual landforms should be considered.

v) From the beginning of planning to the end of building construction, ecological analyses, including soil, water, energy/solar, and noise analysis, should be constantly considered by using advanced technological tools. Finally, the neighborhood should implement ecologically sensitive management and work plan for O&M.

vi) The ability to walk, cycle, or use a low-speed transit system to reach recreation, retail, office, and job destinations can significantly reduce the consumption of energy and emissions of pollution. A good combined transit system will provide more flexible transit methods for neighborhood.

Flexibility

In China, making a transition from the single prototype of traditional Chinese urban neighborhood to diversified spatial forms is painful and time-consuming, but inevitable. Here, flexibility means providing the greatest possible potentials for spatial designs according to different living requirements. This is demonstrated in three ways:

First, urban neighborhoods should most directly and intimately relate to changes in life-styles, social conduct, and public awareness. In China, the basic social and architectural unit has previously been the household or courtyard housing, meaning also the family unit. However, the social system today is premised on the family being the

smallest unit. Accordingly, we should develop our design strategies so as to pay more attention to the articulation of diversified discrete parts or well articulated yet variably open spatial elements, while leaving the collective whole more loosely defined. It must be emphasized that, by paying more attention to the individual and privacy, a fast disappearing aspect of contemporary urban living, our intentions are not at all to undermine of communities or social life, but on the contrary, to redefine them as voluntary and mutual options, rendering them could be much more adaptable and better attuned to liberative lifestyles.

Second, the most beautiful design proposals will not succeed without being backed up by a strong economic, political and social program -- a comprehensive time standard. A new living standard for Chinese urban neighborhoods is necessary, which includes easing standards for preexisting (nonconforming) lots, increasing street and parking standards, and increasing ecological standards. The new living standard could be varied with different emphasis on sustainability, economy, and social equity in different cities. Today, because there is sufficient documentation examining that examine all aspects of sustainable design and development, it is possible to evaluate all aspects of the project from the standpoint of environmental stewardship as economic opportunity. By using computer modeling and life cycle cost analysis tools whenever possible, the comprehensive standard finally impacts the space formation of urban neighborhoods.

Third, housing design is one of the fundamental issues for living space variety in an urban neighborhood. In the past, traditional Chinese urban neighborhoods were always developed on the basis of the courtyard housing units. Now, new building types, such as high-rise towers and block housing, have changed and continue to change the view of the urban neighborhood. It is confusing during this transition period that the traditional dwelling types seem to be less and less useful and new dwelling types always have some problems. As we already know, traditional courtyard houses not only were a place for living, but also reflected the understanding of relationships between humans, society and nature. On the contrary, many modern houses can only be looked upon as a poor place for living, without any reflection of the addressing of society's changing demands and of the natural landscape. The intentions of modern housing design should embrace the introduction of natural and social elements within the realm of architecture, in which the

designer can look forward to new spatial forms through sensitively rational designs and construction, such as what we have done in the past 3,000 years. Furthermore, modern housing design requires individuality and identity more and more than before; to some extent, only forgetting the old time styles can create new spatial forms fitted into current necessity (Figure 6-04).

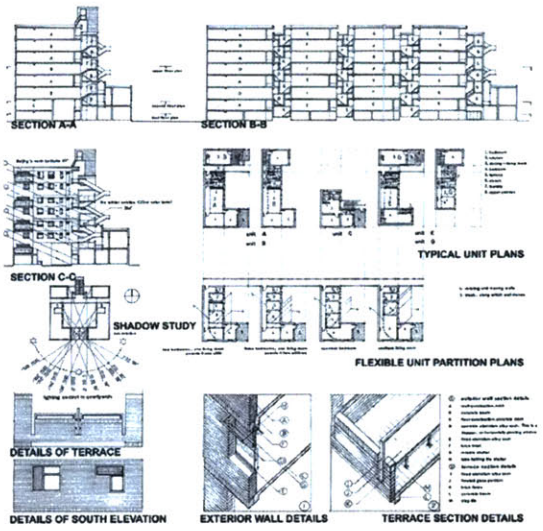

Figure 6-04: A research of urban housing of Beijing, 1993

What should a modern housing be?

The very definition of Chinese urban housing is to reduce wasted space. To achieve this, architects should create spaces that offer residents extraordinary flexibility. Give people the ability to shape and alter the functions of the rooms within the home, and create private and public spaces where people can meet and communicate. For most of the Chinese, for a very long time to come,, the standard of living still will not attain the current average level in the U.S. Also, there are big differences in society and culture between China and western counties. It is unrealistic for China to simply copy design standards from a developed country. Although it will take a very long time for Chinese urban neighborhoods to finish the change from quantity to quality, today's design should be more considerate of economy, safety, and sustainability (Figure 6-05).

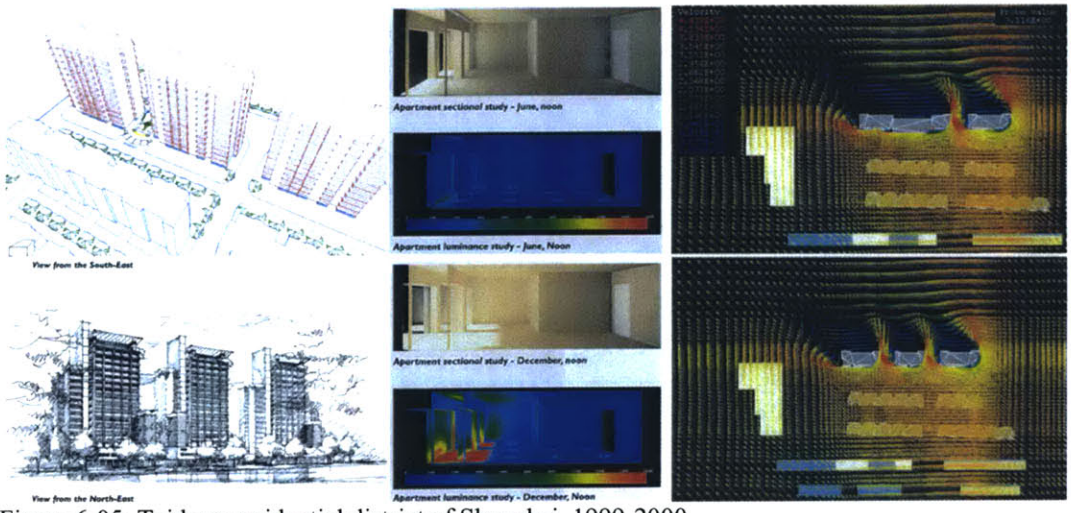

Figure 6-05: Taidong residential district of Shanghai, 1999-2000
(Source: *Sustainable housing in China*)

Humanity

"If oil and water help to define the differences in sustainable practices in the architectures of the world, there is a sense that the challenge of ecological design can combine the mechanistic strength of the West and the spiritual depth of the East."[28]

Humanity means to respect, to the greatest extent possible, the natural and cultural environment and social fabric of each neighborhood to minimize social costs and conflicts involved in urban revitalization. There are four aspects about which we should concerned in future design process:

First, fundamentally, there are three kinds of spatial characteristics: Intimate Space, Transitive Space and Open/Common Space. The interaction of these three spatial characteristics generates the whole spatial forms, from a single house to the whole city. The space interaction first involves in rethinking and reusing the traditional spatial elements. In a traditional urban neighborhood with courtyard housing units, streets, courtyards, half opened corridors, living rooms and private rooms built up a clear hierarchical spatial structure, which tightly connected with the hierarchical family structure. Today, because this kind of hierarchical family structure has been diminished forever, it is impossible and unnecessary to reconstruct the same hierarchical spatial structure in modern urban neighborhood. However, it is possible and useful to learn the relationships between these spatial elements and to reorganize them according to modern life requirements. Finally, some new design concepts should be generated to apply to the neighborhood development (Figure 6-06).

Figure 6-06: Jian Wai SOHO, Beijing, 2000-present
(Source: http://www.panshiyi.com)

[28] Brian Edwards & Chrisna du Plessis, Snakes in Utopia: A Brief History of Sustainability, *Architecture Design*, 07-08/2001, London, pp.29.

Second, abundant cultural heritages can bring greater flexibility of forms. And because of new technology in contemporary era, modernity also brings an abundant and creative design language that designers can freely use to turn their proposals into reality. However, too many choices and too much flexibility both from tradition and modernity can also confuse the designers. Therefore, the ability to find a balance point between tradition and modernity is very important for designers who want to build up the spatial forms on properly. This kind of ability emphasizes respecting culture, the environment and humanity. Furthermore, new urban neighborhoods also need many basic characteristics that have been used for hundreds years, such as human scale, proportion, and perceptions. The new spatial forms should reflect the continuity of traditional spatial forms by maintaining landscape elements, building type, height, texture, and color (Figure 6-07).

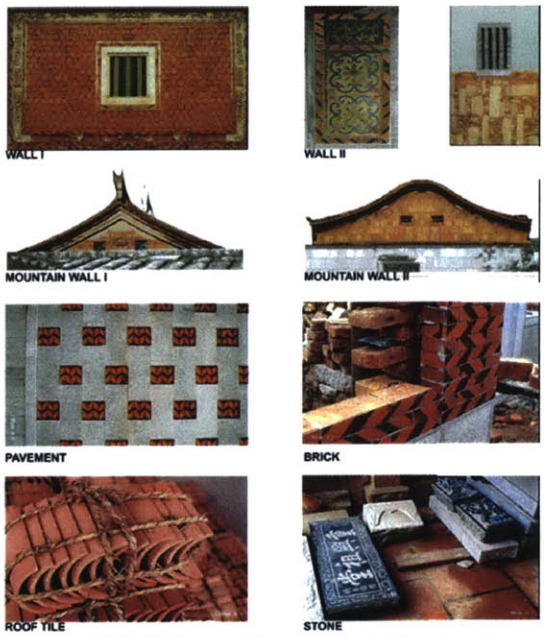

Figure 6-07: Kaiyuansi historic neighborhood redevelopment, Quanzhou, 1997-2000

Third, to reinforce the human scale, the design of a place should facilitate the creation of neighbors and a sense of community while insuring privacy. Freely face-to face interaction is a fundamental human need and perhaps more important today when the traditional large family has become smaller and isolated. As it is difficult to provide a private courtyard for each unit in a modern multi-family house, it is necessary to place more emphasis on streets and common spaces. A modern community needs places where people can meet. A green or common area surrounded by civic and/or mixed-use buildings creates the focal point and core


Figure 6-08: Fengsheng neighborhood, Beijing, 1998
(Source: Department of Urban Planning, Tsinghua university)

of the community and encourages interaction. Housings designed with club, community centers, cafes, retail shops on the first floor and along streets are good places where people can meet in formal or informal situations. Pedestrian pathways connected with small plaza and pocket parks are ideal places for facilitating interaction among many groups (Figure 6-08).

Fourth, designers should be aware of unlimited imagination. There are some very new fancy design concepts for future neighborhoods, especially some pure spatial imaginations (Figure 6-09). It is impossible to estimate and judge the design only by the spatial forms. Designers should be able to plot specific activity patterns and analyze daily activities, tracing on a design plan the way in which people will use the spaces and linkages and finding how people will use and live in this place. This is the key to understanding the human scale and finally making the decisions of the spatial forms.

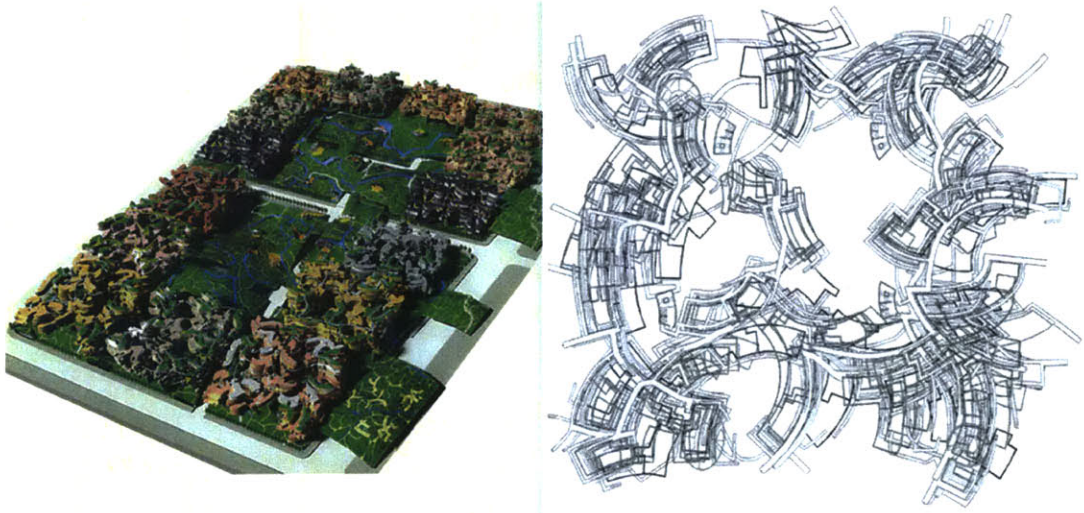

Figure 6-09: Model of Reversible Destiny City, Tokyo bay
(Source: *Architecture design, 11-12/1998*)

Traditional neighborhoods display excellent examples of design according to the human scale and sense of community. We should deprogram many of the characteristics in the current popular pattern's so-called "international style." We must focus on incorporating human scales, features, and functions into the spatial form of development and redevelopment plans to meet the actual requirements of the modern Chinese.

2. New Spatial Forms

Because of the conceptual breakthrough in the use of the housing cluster, denser residential areas have appeared during the process of renewing and renovating housing in

cities, result in high-density urban developments. These residential areas integrate living functions, public service facilities, transportation facilities and infrastructure facilities into one unit. With one building complex, for instance, there are often shops, recreation and sports facilities, commercial centers and hospitals. This kind of residential area adopts an intensive type of arrangement and three-dimensional traffic management, while economizing on land and generally providing an excellent living environment for residents. From this new spatial structure, three modes can be abstracted.

Neo-Fangli Mode

As we said before, based on courtyard housing, the traditional "Fangli" system provided a very perfect human spatial mode for urban neighborhoods. This traditional mode carefully organized intimate space, transitive space and open/common space together into a complicated hierarchical/flexible system, which included not only the strict regulations of streets and some housing characteristics, but also the free space for a courtyard, and some other housing characteristics (Figure 6-10, 11). This both strict and

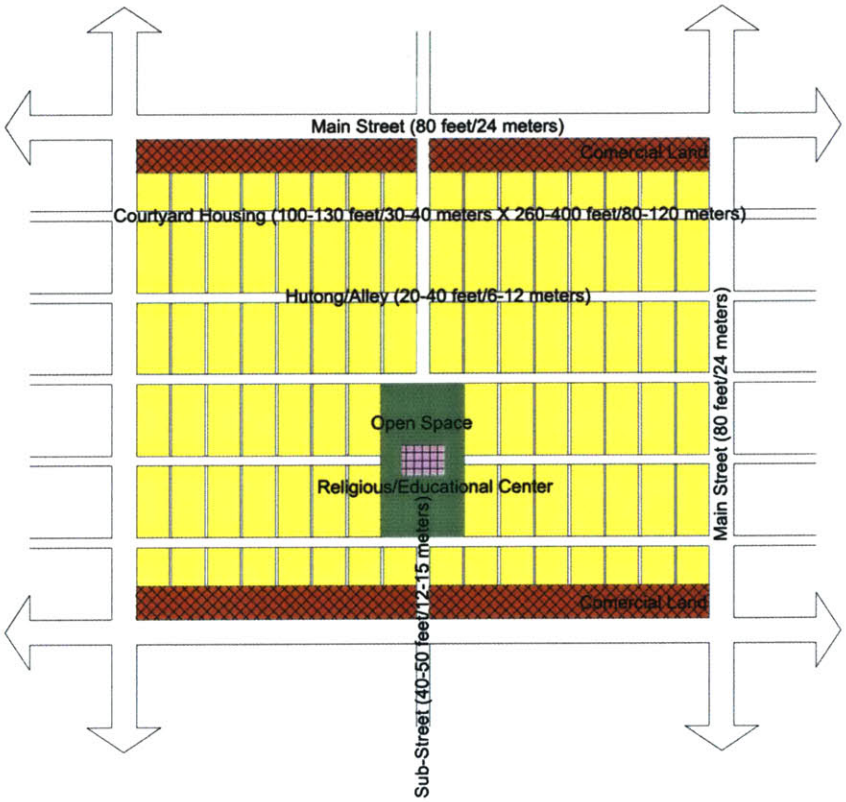

Figure 6-10: Conceptual plan of Traditional Fangli Mode

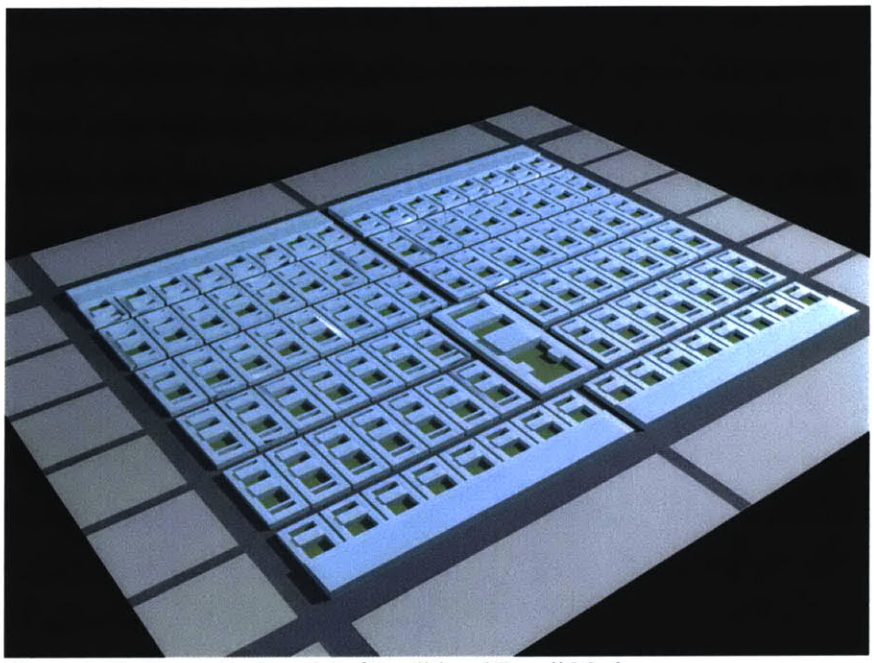

Figure 6-11: Conceptual model of Traditional Fangli Mode

flexible system fit perfect into the social and cultural conditions at that time. For thousands of years, there were no great changes in Chinese social and cultural structures, nor in the spatial forms of the traditional urban neighborhood. Even today, with some modification, it still can satisfy most of five modernity characteristics. The mode includes these principles as below (Figure 6-12, 13):

i) Define boundaries for the neighborhoods (this need not be a physical one).
ii) Increase the density of streets and modify the street scale for modern traffic and infrastructure.
iii) Keep the original scale and surface characteristics of courtyard housings, alleys, and blocks.
iv) Redesign the interior space of dwellings and rebuild low quality dwellings.
v) Strengthen commercial functions along the street as much as possible.
vi) Create more public/common space, especially green space.
vii) Design with community. Investigation and database setup are very important for purposes of preservation and gradual organic development.

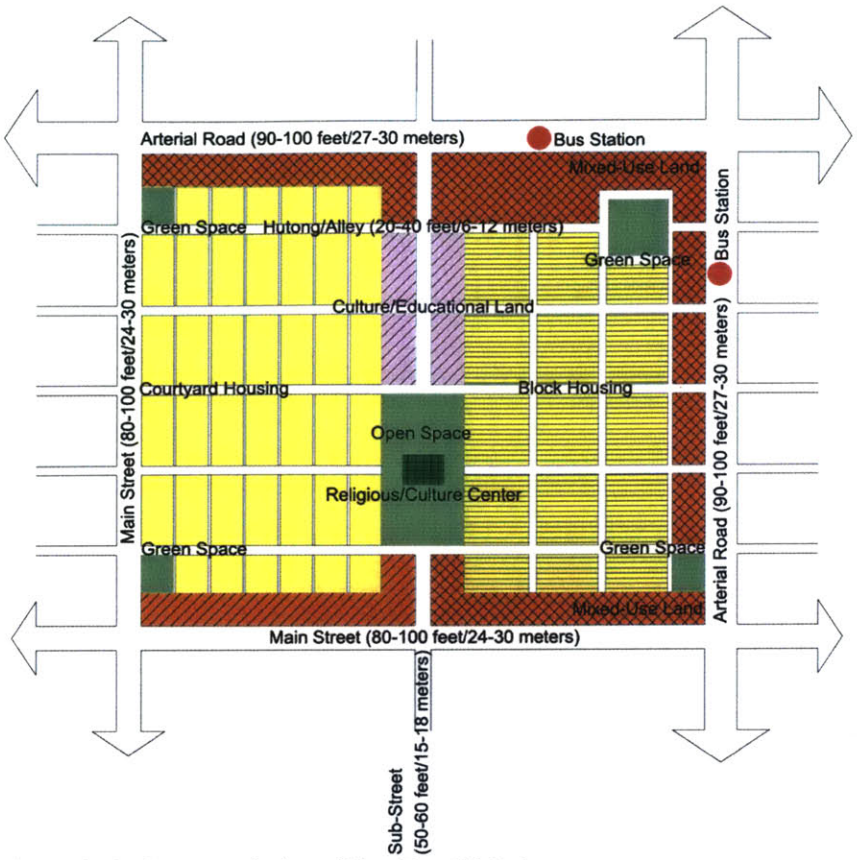

Figure 6-12: Conceptual plan of Neo-Fangli Mode

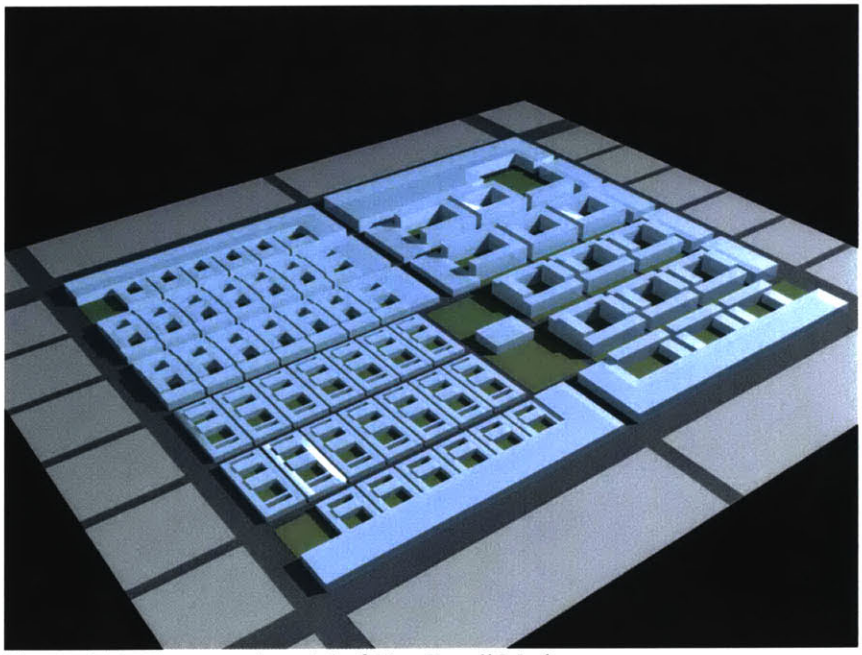

Figure 6-13: Conceptual model of Neo-Fangli Mode

Hybrid Mode

Different from the two modes above, hybrid mode is, as its name implies, a mixed mode combining characteristics from the Neo-Fangli Mode and the Transit Orient Mode. However, it also has some unique characteristics, such as the emphasis on residential clusters and high density. This mode can be used in most urban areas and includes the following principles (Figure 6-14, 15):

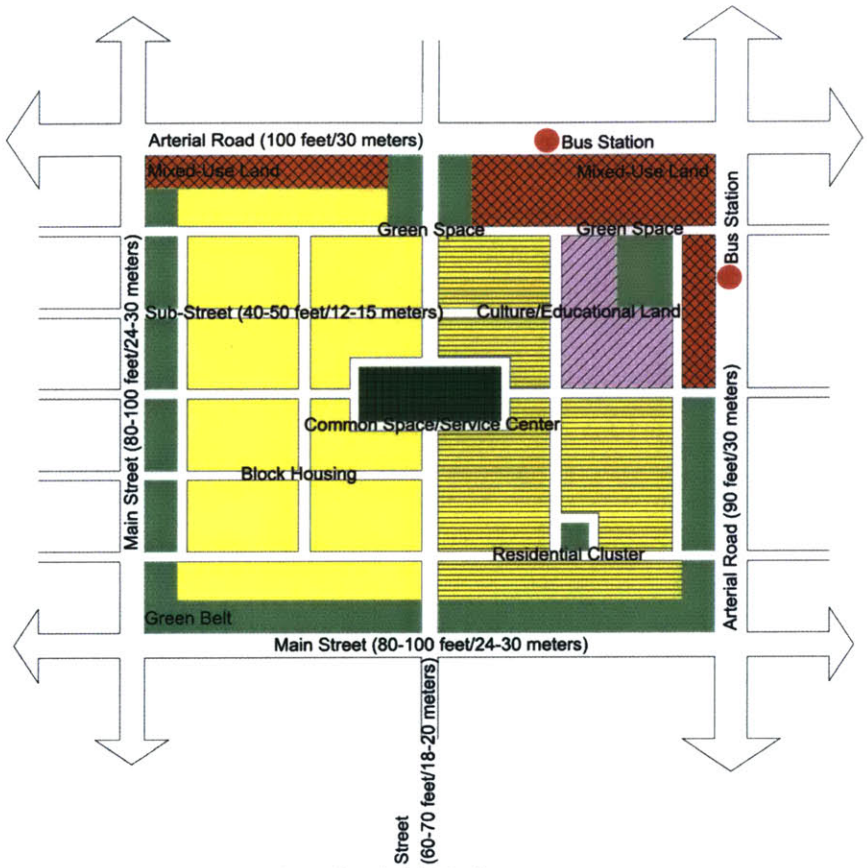

Figure 6-14: Conceptual plan of Hybrid Mode

i) Build clear boundaries for the neighborhoods.

ii) Provide multiple choices of transit between city core and neighborhoods, and among neighborhoods, including high-speed and mid-speed public transportation methods, and private transportation methods.

iii) Organize the street system as an extension of the old city fabric. Generally, it is a hierarchical/grid network that gradually transitions from an automobile system into a pedestrian system.

iv) Adapt the types of residential cluster and multi-family housing. For block defining and housing design, respect of both tradition and creation is important. Especially for housing design, to find the balance between modern design ideas and traditional spatial concepts is the most essential task.

v) Obtain a relatively high density, which means the FAR is no less than 2.0 (2.0-4.0), for both economic and ecological reasons.

vi) Organize the public/common space as a hierarchical/net system to create different communicative levels, which can combine the traditional and modern communication methods.

vii) Design with the city fabric. Spatial transition and the connection between old and new are very important, as are ecological and economic analysis.

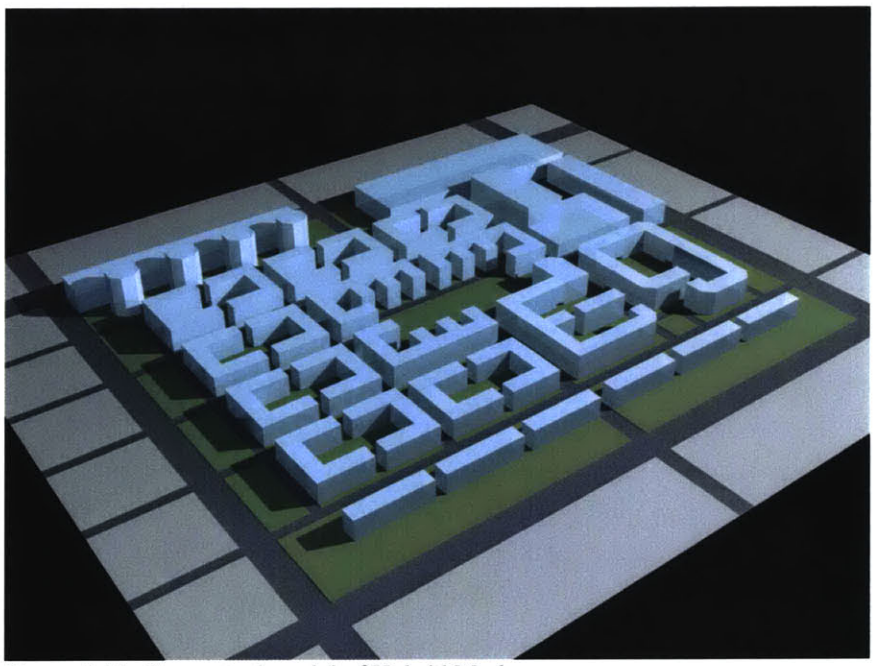

Figure 6-15: Conceptual model of Hybrid Mode

Transit Orient Mode

Transit orient mode is very useful for neighborhoods with a certain distance away from old city core, neighborhoods in suburb, and new satellite towns. This mode is based on TOD and TND theories, and also draws several elements from traditional design modes, including mixed land uses and an interconnected street network. It also develops some new characteristics, including modern community center and new housing styles. The mode includes the following principles (Figure 6-16,17):

i) Build clear boundaries and centers for the neighborhoods.

ii) Provide high-speed transit between the city core and neighborhoods, especially public large-capacity modes of transportation.

iii) Organize the street system as a grid network that accommodates pedestrians and bicyclists, as well as automobiles.

iv) Encourage variety in housing design.

v) Obtain mixed land uses as much as possible, especially recreation, culture, education, and commerce.

vi) Organize the public/common space as a net system to create more opportunities for communication.

vii) Design with nature. Sustainable development and ecologically sensitive evaluation of the site should be considered, as should economic analysis.

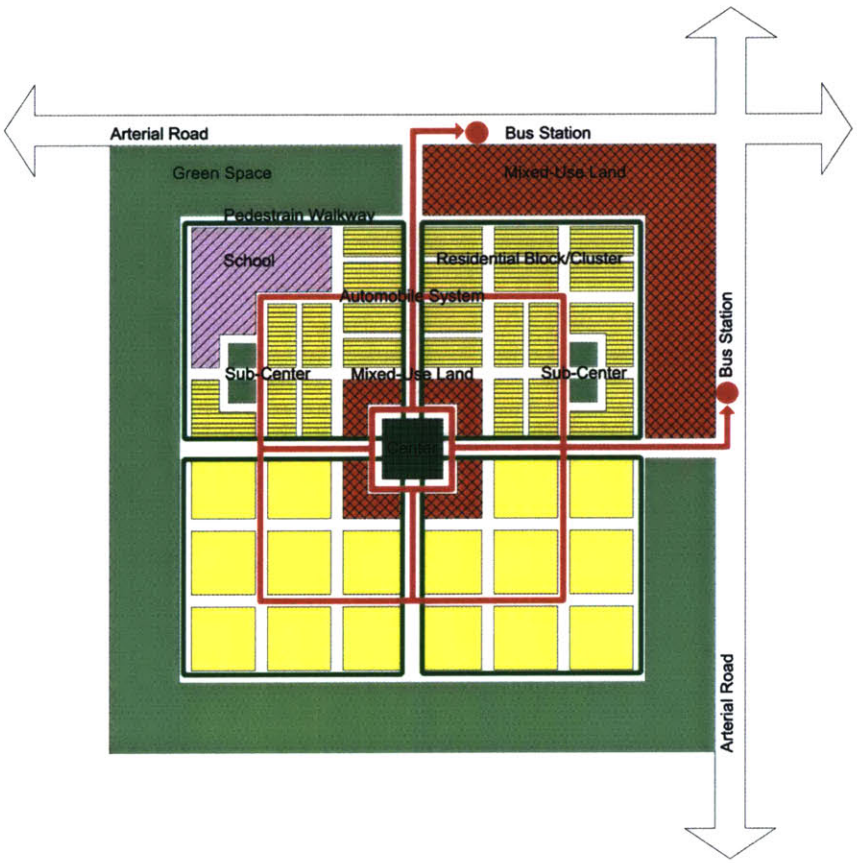

Figure 6-16: Conceptual plan of Transit Orient Mode

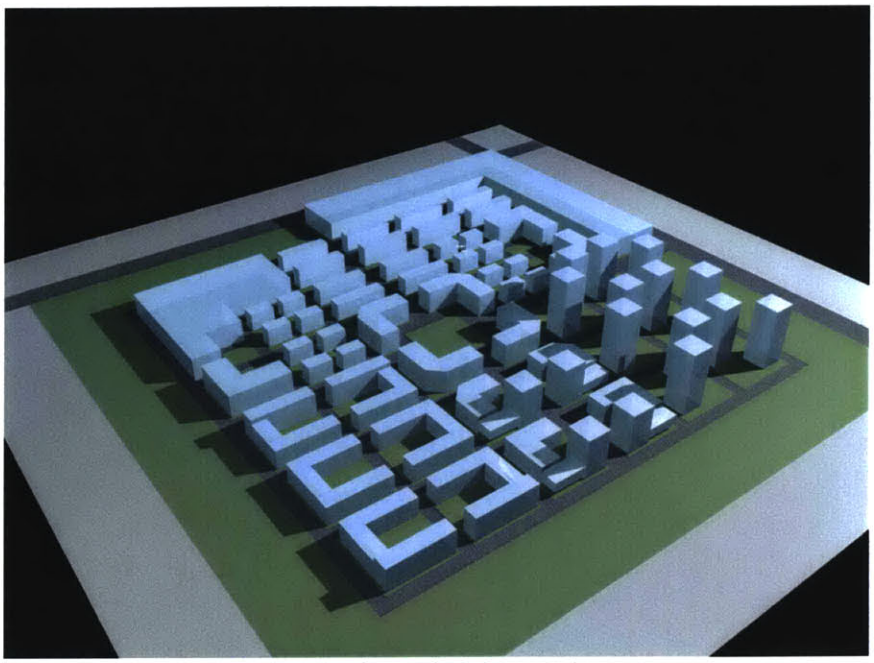

Figure 6-17: Conceptual model of Transit Orient Mode

3. Design a Modern Community

The Communicative Design Method

In a high-performance sustainable neighborhood development, the focus shifts from a compartmentalized process to a multidisciplinary approach. Designers should be involved in setting the goals of the project to ensure that future decisions will be made with the project's intentions intact. Early involvement also opens the communication paths for design integration and effective troubleshooting as the project develops. The team may include the project owner, the project user, the building manager, architects, engineers, consultants, a construction manager, the contractor, subcontractor and suppliers, government agencies, the local community, and even funding agencies. Nonprofits and universities can provide areas of expertise such as technical information and group facilitation.

The government's main tasks include using policy tools to keep social security and equity, supporting legislation for tax incentives to promote infill housing, adopting infrastructure strategies that support redevelopment in infill areas, implementing a parcel assembly program and strategic land banking according market requirements and

redevelopment planning, and adjusting the supply of land available for development in a large-scale area.

Developers' tasks include encouraging convenient commercial services to support neighborhood needs, increasing access to job opportunities for existing residents, employing crime prevention design to promote security and retain families, and attracting new residents by providing cultural facilities and public realm improvements, providing convenient transit service and continuous pedestrian network, and providing different standard housing choices and new housing types.

Local community's tasks include learning design standards that include guidelines for improved compatibility between themselves, taking part in the design and review processes, ensuring housing types that are compatible with existing types, and reflecting the suggestions and requirements from residents.

Planners' and architects' tasks include scrutinizing each project for its potential to be administered through a team approach, involving as many interested stakeholders as possible in the design process, investigating whether it is available through local nonprofit organizations, universities, community design centers or professional design organizations if interested individuals or team members do not have the time or expertise to develop a team approach to the project, and educating the colleagues and constituents to the benefits of team-integrated design.

Communicative design methods should be a trend in the future, as well as objective analytical ability and resolution methods that are essential in our design process. I do not suggest that creative ideas are unimportant, but that public participants and learning in design process are in reality more important. Designers should seek to inform all the participants, who must be ready to learn and to change, and to make sure that all stake holders, especially those who live in close proximity to the project, are aware of the true costs of development, including long-term impacts on the community and the life-cycle aspects of the project. Furthermore, designers should attempt to develop a neighborhood-learning concept by interviewing local social, cultural and educational service providers, decide adaptable building functions and reorganizing urban space. Thus, learning serves as a useful medium for community design and becomes a final purpose of design.

Communication and Learning

Homes and neighborhoods could be centers of learning and invention in the future. A city for learning will bring the skills and experiences of teachers from all over the world directly to where you live. Children could supplement their classroom work by visiting other places through new, sensually rich media in the home and neighborhood. They could easily use new computational devices to playfully explore the world. Seniors could stay involved with life by participating in social events, politics, and study, even when they become frail and homebound. Busy parents could study to keep up in their professions, or for intellectual stimulation, and they could do it in the comfort of the homes and neighborhoods, when time is available. Learning will be an important requirement for future design, especially how to reshape open spaces and reuse existing buildings.

What a designer will do most of his time in design process is to "speak truth to the power." That is, designers will be deeply engaged in a net of activities that influence public and private actions in direct and indirect ways. An important rule in the design process is to "recognize that being right is not enough." For a practitioner, far more than presenting a well-done analysis to appropriate decision-makers, the design process involves a deep engagement with the players who will be making the changes. They involve practices, which will allow new information to become embedded in the thinking of policy actors and in the institutions that determine what is done.

The current Chinese community organization is very useful to create a final successful urban neighborhood. The difficulty is to anticipate that as one involved in these communicative processes, one may well learn one is not right. So, learning is necessary. The communicative and collaborative process is a good way of developing learning, logic and dynamism. Each participant has knowledge to bring to the other. The professional designer is but one of these participants. The knowledge the designer can provide is important, but the ability to create or manage a communicatively rational form of deliberation is even more significant. Practitioners, for the most part, are interactive designers, and for them communicative rationality can be a way to link speech and truth.

4. Conclusion

Today, China faces many of the same neighborhood development problems encountered elsewhere in the developed and developing countries and with many similar market mechanisms and institutional practices in place. It is also turning its attention to a prodigious program of catching up and to accommodating rapidly rising future increases in urban population. There still remain too many problems to solve. For example: How are they to create modern forms unique to China that will evoke a sense of belonging among the residents? What should an urban neighborhood be like that employs environment friendly techniques such as recycling and the use of natural energies and which proposes possibilities of implementing innovative techniques? In what way can residents commit themselves to their own living environment? There is a multitude of challenges in contemporary Chinese urban neighborhood development.

There are some common characteristics in Chinese traditional urban neighborhoods, such as mixed land use and highly interconnected street system that accommodate the pedestrian and bicyclist equally as well as the automobile. What we need is some more comprehensive modeling evaluations, which would be helpful to determine the impact of modern transportation design, especially as it compares to other design approaches. A major limitation of current research so far is its restriction to isolated developments. Since the transportation impacts of urban neighborhood development will most probably accrue in a regional area, a truly regional mix of diversified neighborhood developments is necessary.

In sum, Chinese urban neighborhoods have been clustered forms of multi-story housing arising out of both the Chinese tradition and foreign importations, especially the international practice of diverse spatial forms, with high residential densities, which could serve China positively with regard to further community development, and environmental sustainability. Furthermore, this could be reinforced by the relatively fine grain of mixed-use and inter-digitations of a variety of non-residential uses, which is a widely present aspect of China's urbanization. It is obvious that foreign influences appear to have been copied, then modified and finally digested as relatively recognizably Chinese. Throughout, as described in this thesis, five spatial characteristics of modernity combined with the traditional prototypes have formed the backbone of the general

process of adaptation and transformation. Finally, from them, three development modes are generated, which give us a design outline of future spatial forms of Chinese urban neighborhoods (Figure 6-18).

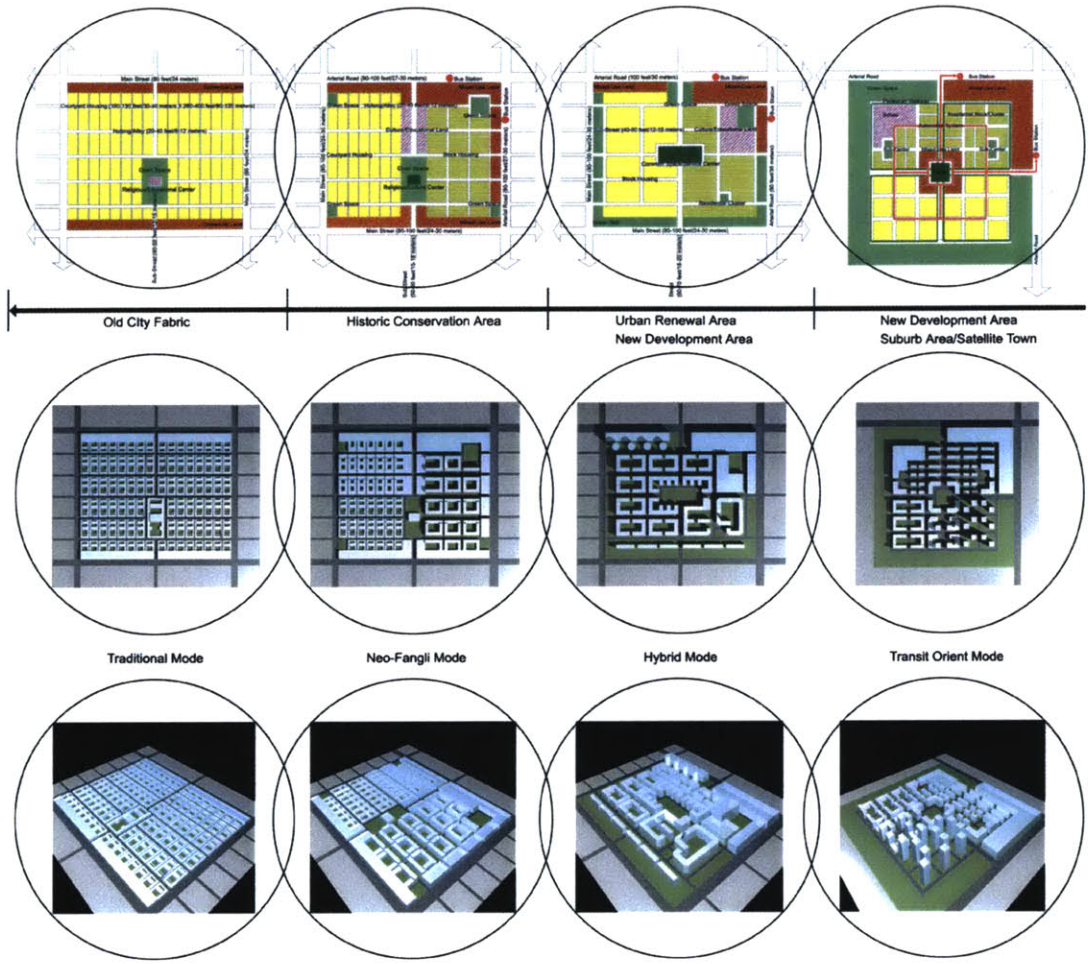

Figure 6-18: The transition of different spatial modes

REFERENCES

1. Junhua, Lu., Rowe, Peter G and Jie, Zhang. 2001. *Modern Urban Housing in China 1840-2000.* Prestel, Munich, London & New York.
2. Edmonds, Richard L. 2000. *Managing the Chinese Environment.* Oxford University Press, New York.
3. Jenks, Mike and Burgess, Rod. 2000. *Compact Cities: Sustainable Urban Form for Developing Countries.* Spon Press, London & New York.
4. Melhuish, Clare. 2000. *Modern House 2.* Phaidon Press, London.
5. Williams, Katie, Burton, Elizabeth & Jenks, Mike. 2000. *Archiving Sustainable Urban Form.* E & FN Spon, London & New York.
6. 1999. Guildelines for creating high-performance green buildings, Tom Ridge, Pennsylvania Department of Environmental Protection.
7. Giddens, Anthony. 1999. *The consequences of Modernity.* Polity press, Cambridge.
8. Girardet, Herbert. 1999. *Greating Sustainable Cities.* Green Books Ltd, Devon, UK.
9. Kai-Yin, Lo and Puay-Peng, Ho. 1999. *Living Heritage: Vernacular Environment in China.* Hong Kong.
10. Klauser, Wilhelm &Yamamoto, Riken. 1999. *Riken Yamamoto.* Birkhauser Publishers, Basel, Boston & Berlin.
11. Punter, John. 1999. *Design Guidelines in American Cities.* Liverpool University Press, Liverpool.
12. Wu, Liangyong. 1999. *Rehabilitating the Old City of Beijing.* UBC Press, Toronto.
13. Yaping, Wang & Murie, Alan. 1999. Housing Policy and Practice in China. MaCmillan Press Ltd., London.
14. Lemons, John., Westra, Laura and Goodland, Robert. 1998. *Ecological Sustainability and Integrity: Concepts and Approaches.* Kluwer Academic Publishers, Dordrecht, Boston and London.
15. Maldonado, Eduardo & Yannas, Simos. 1998. *Environmentally Friendly Cities.* James & James (Science Publishers) Ltd., London.
16. 1997. *Infill Development: Strategies for shaping Livable Neighborhoods.* Municipal Research & Services Center of Washington, Seattle.
17. Gordon, David. 1997. *Battery Park City, Politics and Planning on the New York Waterfront.* Gordon and Breach Publishers, New York.
18. Birnbaum, Charles A. & Peters, Christine C. 1996. *Guidelines for the Treatment of Cultural Landscapes.* U.S. Department of the Interior Nation Park Service, Washington, D.C.
19. Brower, Sidney N. 1996. *Good neighborhoods: A Study of In-town and Suburban Residential Environments.* An Imprint of Greenwood Publishing Group, Inc. Westport.
20. Schinz, Alfred. 1996. *The Magic Square: Cities in Ancient China.* Stuttgart & London.

21. 1995. *Housing Developments: New Concepts in Architecture & Design.* Nissha Printing Co., Ltd., Tokyo.
22. Glendinning, Miles & Muthesius, Stefan. 1994. *Tower Block.* Yale University Press, New Haven & London.
23. Day, Lincoln H. & Xia, Ma. 1994. *Migration and Urbanization in China.* M.E. Sharpe, Inc., New York.
24. Katz, Peter. 1994. *The New Urbanism Toward an Architecture of Community*, McGraw-Hill, Inc., New York, San Francisco & Washington, D.C.
25. Nelessen, Anton C. 1994. Visions for a New American Dream: Process, Principles, and an ordinance to plan and design small communities. American Plan Association Planner Press, Chicago & Washington D.C.
26. Cecilia L.W., Chan. 1993. *The Myth of Neighborhood Mutual Help: The Contemporary Chinese Community-Base Welfare System in Guangzhou.* Hong Kong University Press, Hong Kong.
27. Naumkin, Vitaly V. 1993. *Caught in Time: Great Photographic Archives China.* Garnet Publishing Limited, London.
28. Rowe, Peter G. 1993. *Modernity and Housing.* The MIT Press, Cambridge.
29. Joan, Pere & Mira, Ravetllat. 1992. *Block Housing: A Contemporary Perspective.* Editorial Gustavo Gili, S.A., Barcelona.
30. Alterman, Rachelle and Cars, Goran. 1991. *Neighbourhood Regeneration.* Mansell Publishing Limited, London & New York.
31. Angelil, Marc M. 1990. *On Architecture, the City, and Technology.* Association of Collegiate Schools of Architecture, New York & Washington, D.C.
32. Kojima, Reeitsu. 1987. *Urbanization and Urban Problems in China.* Institute of Developing Economies, Tokyo.
33. Liangyong, Wu. 1986. *A Brief History of Ancient Chinese City Planning.* URBS ET REGIO, GHK.
34. Lynch, Kevin. 1984. *Good City Form.* MIT Press, Cambridge.
35. Laska, Shirley B. and Spain, Daphne. 1980. *Back to the City: Iissues in Neighborhood Rrenovation.* Pergamon Press, New York.
36. 1979. *Chinese Walled Cities: A Collection of Maps from Shina Jokaku no Gaiyo.* The Chinese University Press, Hong Kong.
37. Mackay, David. 1977. *Multiple Family Housing: From Aggregation to Interaction.* Architectural Book Publishing Co., Inc., New York.
38. 1976. *New China Buildings.* China Building Industry Press, Beijing.
39. Lewis, Mumford. 1968. *The Urban Prospect.* Harcourt Brace Jovanovich, New York.
40. Schmitt, Karl W. 1966. *Multistory Housing.* Frederick A. Rraeger Publishers, New York & Washington, D.C.

41. Greer, Scott. 1965. *Urban Renewal and American Cities.* A subsidiary of Howard W. Sams & Co., Inc. Indianapolis, New York & Kansas City.
42. Jacobs, Jane. 1961. *The death and life of great American cities.* Vintage Books, New York.
43. Sitte, Camillo. 1945. *The Art of Building Cities.* Hyperion Press, Westport.
44. *Architecture Design* (AD)
45. *Architecture + Urbanism* (A+U)
46. *Building Design* (BD)
47. *Global Architecture Document* (GA)
48. *The Japan Architect* (JA)
49. *Progressive Architecture* (PA)
50. *Space Design* (SD)
51. *Techniques & Architecture* (T&A)
52. *World Architecture* (WA)