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Research Article

Shennan Road and the modernization of Shenzhen architecture

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Abstract Shenzhen exemplifies the rapid development of urban planning and construction in China. Over the last 40 years, many representative urban spaces and buildings have been built on Shennan Road, the city's main east–west thoroughfare, which has witnessed the formation of a multicenter structural layout and the miraculous expansion of the city. Many iconic buildings were designed by Hong Kong or foreign architects. The continuous development along Shennan Road not only symbolizes the fruits of the reform and opening up policies of Shenzhen and even China, but also reflects the modern architectural history in Shenzhen. This study uses historical research methods to review the changes in the urban fabric and the design trends, as seen in representative buildings along Shennan Road in different periods. In addition to the transition path of the city center, the unique role of streets and buildings in the development of the urban structure is analyzed, and other urban functions and symbolic meanings are identified. This work contributes to the history and theory of the modernization of contemporary Chinese architecture.

1. Introduction

In 1978, China launched its open-door policy and embarked on rapid development. The tide of urbanization led to architectural modernization, which continuously advanced over the decades. During the past 40 years, Shenzhen has been a pioneer of economic reform and liberation. Transforming from a small border town to a bustling metropolis of 20 million population, Shenzhen has set an example for the other parts of China with its urbanization, city expansion, and new town development. New economic and urban design policies have been initiated and experimented first in Shenzhen and then promoted to the entire country.

Facilitating the fast growing economy in terms of manufacturing as Shenzhen transforms from a light industry center to a high-technology hub, the urban architecture in the city presents continuous progress and new faces in the

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macro and micro scales. According to the Council on Tall Buildings and Urban Habitats, Shenzhen built more buildings over 200 m than other cities in the world between 2016 and 2018 (DeWolf, 2017; CTBUH, 2018). In 2017, Shenzhen's GDP surpassed that of Hong Kong, and *Lonely Planet* listed Shenzhen as one of the best tourist destinations in 2019 (Li, 2018). Shenzhen is undoubtedly an urban example of fast growth not only in China but also in the world (O'Donnell et al., 2017).

In less than 40 years, Shenzhen has grown from a small town into a metropolis. Compared with the hinterlands in the Yellow River area, which is home to thousands of years of civilization, Shenzhen has minimal traceable historical vestige. Its area has expanded sixfold, its population has increased by 40 times, and its GDP has grown by nearly 9000 times.[1] The driving force behind this growth is the Chinese government's call for modernization in 1978 and the people's desire to move away from poverty. This rapid growth is embedded in the construction history of the city's urban spaces and representative buildings. The achievements of urban architecture in Shenzhen are multifaceted and worth exploring. "Three Paths and One Leveling" was the slogan that inaugurated the construction of the Shenzhen Special Economic Zone (SEZ), three east—west avenues forming the skeleton of future urban incarnations (Chung et al., 2001). To understand its architecture, we zoom into Shennan Road, a 25.6 km-long east—west thoroughfare in the city. This trunk road is home to many representative urban spaces and buildings and is the origin and core of the city's multicenter structural layout and miraculous expansion (Fig. 1). Shenzhen has 19 main south—north roads within the Shenzhen SEZ's original management line (the second line), of which 16 across this east-west road. Many cities have historic and important roads, such as Chang'an Street in Beijing and Champs—Elysees in Paris. Chang'an Street connects a series of government buildings and representative projects with political significance. Other Chinese cities followed Beijing and developed major streets as political and cultural centers (Yu, 2016). Similar to Chang'an Street in Beijing, Shennan Road runs through the main area of Shenzhen, exhibiting not only the fruits of China's reform and opening up policy but also the growth history of Shenzhen's architectural modernization. According to the Chinese government's appeal, "modernization" in this context is materialistic with an intention of embracing advanced technology, management, and prosperous life (Deng, 1993).

The current study attempts to discover the development of Shennan Road and aligns the landmark buildings along the avenue to the salient urban phenomenon of Shenzhen and Chinese cities in the past 40 years. According to the popular division of historic periods from 1978 to 2020, contemporary China and its cities have gone through at least three stages: early open-door stage of 1978—1989; persisting reform by Deng's statement from 1991 to 2000; and global time from 2001 to the present, as evidenced by a series of international events. The geography of Shenzhen is constrained by mountains in the north, and thus, the city must develop eastward or westward. Shennan Road connects the east and the west and is the most important, longest, and oldest traffic thoroughfare. It is laden with the expectations of government and citizens. By studying the history of Shennan Road and the buildings along the road, one can see the strenuous path of Chinese modernization led by the spirit of "crossing the river by feeling the stones."[2]

After a literature review, we unfold three periods of Shenzhen's urban construction and the typical buildings of Shennan Road in each period. The authors have long been involved in the study of Hong Kong and Shenzhen architecture, and have investigated the road's architectural history using firsthand materials. The writing is in a historic narrative. We hope that this work can supplement the existing research into Chinese architecture and provide references for other world cities facing similar demands and challenges.

2. Literature review

Internationally, precedent and parallel examples of fast growing cities exist. As the capital city of South Korea, one of the four Asian dragons, Seoul created an economic miracle after reforming its economy in the 1970s. The industries moved to satellite towns, and state administrative departments moved to the south, which was linked to the central city via a subway. This setup opened a "Gangnam" model. In the 1980s, Seoul maximized the opportunity of hosting the Olympic Games, built city infrastructure, and developed the Gangnam area. In the 21st century, government departments were further moved out to stimulate the satellite towns around Seoul (Child and Kim, 2000; THUPDI, 2017). As discussed later, Shenzhen first set up industrial parks in Luohu and Shekou and then moved the administrative center to Futian. After 2010, Shenzhen grabbed the opportunity of running Universiade, expanded its network of subways, and stimulated the development of Baoan and Longgang, which were outskirt districts originally.

Dubai may be a prominent case of fast ascent. When British planner John R. Harris made the second version of the masterplan in the early 1970s, road skeleton of the city was confirmed. The so-called "life line" Sheikh Zayed Road was planned at the same time. Several early landmark buildings were built along the road in the 1970s, including Harris' design of the 40-story Dubai World Trade Centre. In the 1980s and 1990s, Sheikh Zayed Road led to Jobel Ali Free Zone, a new central business district (CBD) area. Its clusters of high-rise buildings symbolize Dubai. In the past 20 years, a group of famous landmark buildings have soared along Sheikh Zayed Road, including the sail-shaped Burj Al Arab, the twin towers of Jumeirah Emirates, and the tallest building Burj Khalifa. In 1998, Sheikh Zayed Road was 30 km long. Today, it extends to 55 km with 12 lanes. The subway line closely follows the road and grants access to various important commercial and tourist spots (Elsheshtawy, 2009;

[1] Data sourced from the Statistics Bureau of Shenzhen Municipality website.

[2] This saying comes from Deng Xiaoping and means "to test and learn by doing."

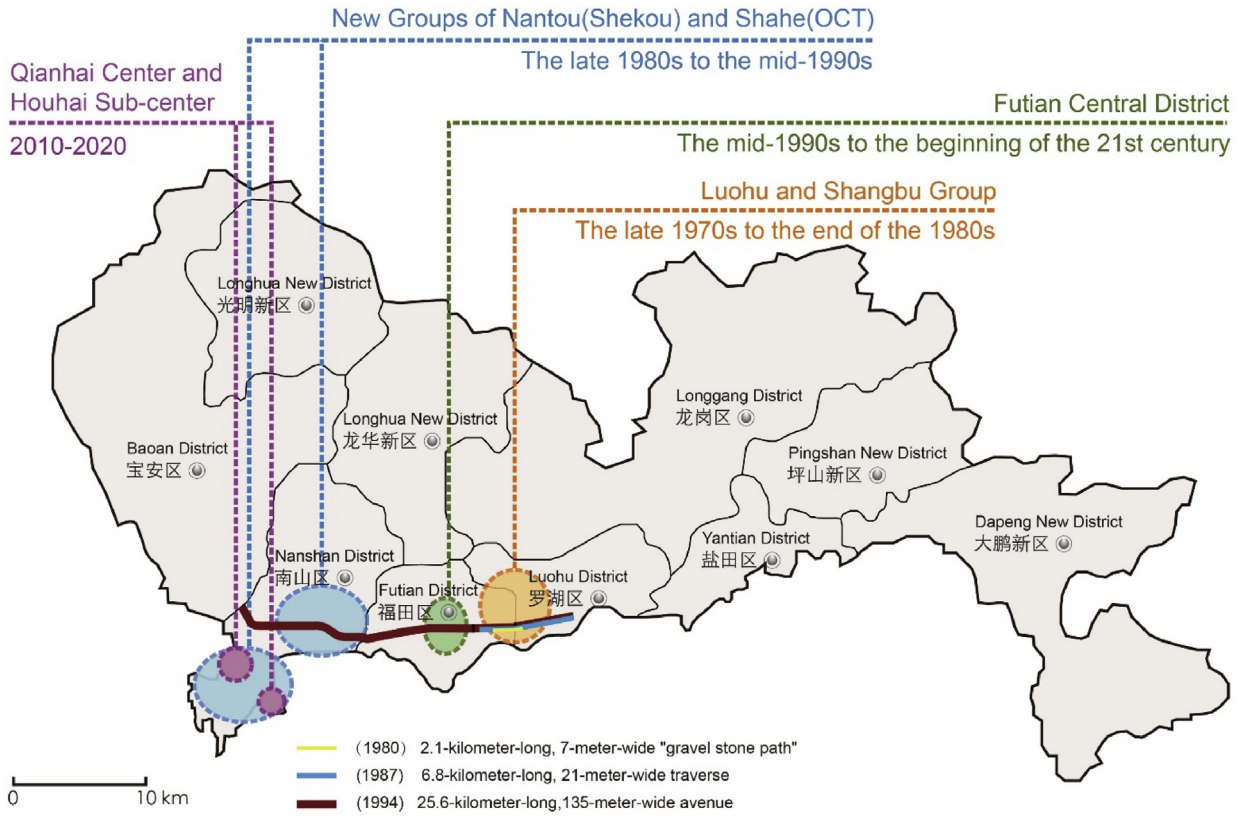


Figure 1 Key areas for several construction booms in Shenzhen and Shennan Road development in different periods. Drawn by the authors.

Bloch, 2010). As analyzed in the following text, Dubai and Shenzhen somewhat coincide in urban development, although the urban structure of Shenzhen is much more complicated than that of Dubai. Both cities have minimal historic burden, extend a major avenue, and attract clusters of high-rise building development.

After obtaining economic success, Seoul and Dubai used international starchitects and famous buildings to enhance their international images and soft power (Elsheshtawy, 2009; Yun, 2017). When Shenzhen had accumulated wealth for more than 10 years, it naturally solicited enhanced designs and sought popular brand designers from international design competitions. This practice has repeatedly been proven successful in other Chinese cities (Xue, 2006a, 2006b; Xue and Ding, 2018).

3. Period 1 Early years in the open-door frontier: 1980—1990

The early 1980s saw the "experiment" of adopting an "open-door" policy in Chinese coastal cities. Shenzhen is one of the four designated special economic zones because of its gateway function to Hong Kong. In the preliminary stage of the construction of the Shenzhen SEZ, the construction of infrastructure and cultural facilities in Shenzhen was almost zero. Planning was drawn on almost a tabula rasa. Before the 1980s, the main road in Shenzhen was 107 National Road, which ended at the Wenjindu border check point. The People's Cinema was built in 1949, the Shenzhen Theater opened in 1958, and the exhibition hall opened in 1975. Together, these three cultural venues cost 600,000 yuan, and they served an area of 327.5 km^2 (Wang, 2007).

In 1980, the Shenzhen SEZ was established. Decision makers quickly agreed on the need for a "decent" east—west road due to the narrow terrain. In the same year, a 2.1 km-long and 7 m-wide "gravel stone path" was built from Luohu to Shangbu and was called Shennan Road. In 1981, the new mayor, who had just returned from a visit to Singapore, decided to make the road 100 m wide. This decision was immediately opposed by various people (Li, 2007). At the beginning of 1987, Shennan Road became a 21 m-wide road stretching 6.8 km across downtown Shenzhen (Office of Local Chronicles Compilation of Shenzhen, 2012). The city area stopped in Shangbu group, punctuated by Shanghai Hotel built in 1985. Westward from Shanghai Hotel was a suburban area.

Buildings were gradually built on both sides of the road. The layout of the first-generation skyscrapers formed the main axis of the city (Fig. 2). In 1982, the "Electronic Building" was completed in Shennan Road at the junction of Shangbu. Its 70 m height made it the tallest building in Shenzhen, and its design showed a horizontal strip window and white walls. Before the 1990s, the only place within China that had a cluster of skyscrapers developed in accordance with a master plan was the Luohu District of

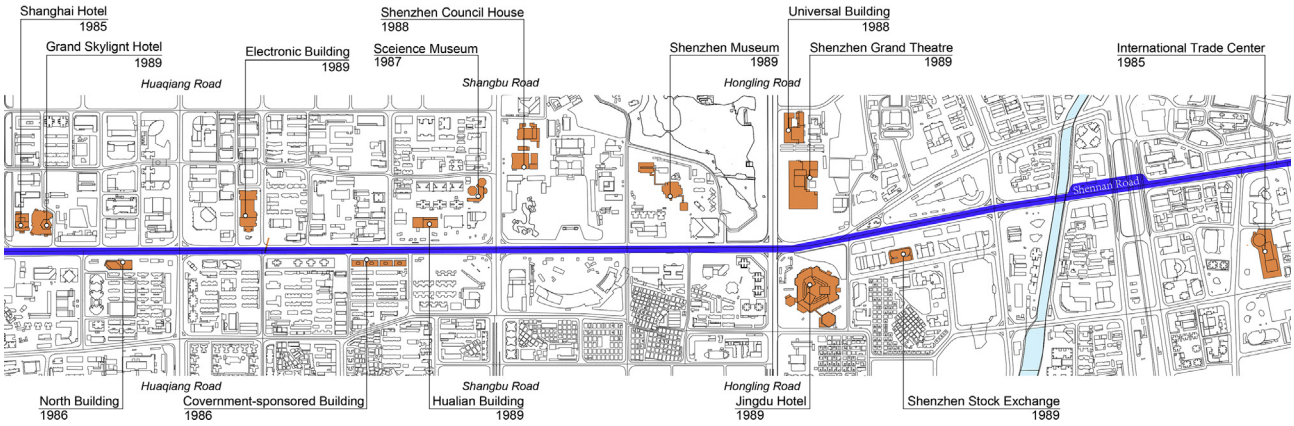


Figure 2 Buildings along Shennan Road completed in the 1979—1989 period. Drawn by the authors.

Shenzhen, including the 160 m-high International Trade Center, which as the tallest building in China then (Li, 2007). Many people, including architects from various parts of China, visited Shenzhen to study the achievements of the open-door policy and high-rise buildings.

Most buildings built in this period have a functionalist modern architectural style with minimalist facades. Most of the commercial and office buildings are shaped like square boxes with simple horizontal/vertical strip windows or brown glass curtain walls with dark brown aluminum window frames in the facades. The architectural image is imposing and solemn (Fig. 3). Generic "commercial" buildings may exist in today's term. However, even these "generic" buildings became role models for other hinterland cities. Most Chinese cities had not yet experienced such intensive construction of commercial buildings that were badly needed in the 1980s. In 1986, when Shanghai was just experimenting on a "tube-in-tube" structural system in a 26-story office building, Shenzhen already completed the 50-story and 160 m-high International Trade Center with a rotating restaurant at the top. The rotating restaurant was one of the gimmicks that American architect John Portman used in his hotel design in the 1970s. Portman's design spread to China through trade magazines, and Chinese architects quickly picked it up and first used it in Shenzhen (Qin, 2019).

The first upsurge in the construction of cultural facilities began in 1983 when the Shenzhen Municipal Party Committee and Shenzhen Government approved a cultural infrastructure plan for the city, which consisted of eight cultural facilities: a library, a grand theater, a television station, a stadium, Shenzhen University, Shenzhen Museum, a news center, and a science museum. The cost was nearly 700 million yuan, which represented the government's largest investment in public facilities in the 1980s. Li Weiyan, the Minister of Propaganda Department of Shenzhen at that time said, "From 1981 to 1983, the total investment for the cultural construction accounted for 33% of the local financial infrastructure investment" (Cultural and Historical Records Committee of Shenzhen CPPCC, 2001).

Five of the eight projects were located on Shennan Road, and four, namely, Shenzhen Library, Shenzhen Museum, Shenzhen Grand Theatre, and Science Museum, were designed by Lingnan School architects (Fig. 4). In the 1950s and 1970s, the Lingnan School of Modern Architecture based in Guangzhou played an active role in the construction of Shenzhen. "Lingnan" was the opposite of the "official national form," an excessive decoration linked to a political ideology that was mainly popular in Beijing. In the early 1980s, "Lingnan" was a fortress of Chinese modern architecture. The Chinese traditional decorative symbols

Figure 3 Representative buildings along Shennan Road completed in the 1980s. Photos by the authors.

Figure 4 Representative buildings along Shennan Road designed by Lingnan School architects. Photos from the Internet.

were abandoned. The flexible layout, geometric mass, asymmetrical form, and plain color buildings were widely admired in architectural design circles (Xiao and Yin, 2016; Shi, 2010; Xue and Ding, 2018).

The four representative works of the Lingnan School discussed in this paper demonstrate how the Lingnan architects based their design on the buildings' functions and gave full play to the expressive force of modern materials (for example, the façade of the Grand Theater is decorated with a golden glass curtain wall, and it was dubbed the "Golden Fairy and Pride of Shenzhen" for its magnificent appearance). Most of the buildings in this style have a simple geometric shape and are free from cumbersome decorations that create a sculptural effect.

These cultural buildings, particularly the Grand Theater of Shenzhen that became the first theater to call itself "grand" in China, concluded the early period of the open-door policy. At that time, almost no foreign architects participated in the design. Architecture in Shenzhen and along Shennan Road in the 1980s was the natural continuation of Chinese architecture during that period. Given the intensive construction, Shennan Road gathered and highlighted the possibly high achievements that Chinese architecture could attain in the 1980s.

4. Period 2 Continuous liberating ideas and opening doors: 1990—2000

In 1992, Deng Xiaoping delivered the renowned "South Tour Talks" during his inspection of the coastal areas in Guangdong province. Shenzhen was designated as an "experimental field" by Deng in 1979, and such label was reinforced in his 1992 speech. Deng is undoubtedly the godfather of Shenzhen. Under the slogan "Development is the top priority" (Deng's maxim), a new round of construction started, and the deadlock of the reform and opening up was broken.

To carry out Deng's instruction, Shenzhen was determined to leap forward. However, the old district of Luohu could not accommodate any spectacular plan. New buildings were completed in Shenzhen, but the most prominent works in Shenzhen in the 1990s were the urban design in Futian and the Overseas Chinese Town Area (OCT). "Urban design," an academic and professional concept, was introduced in China in the 1990s. With urban design as basis, landmark buildings were designed and constructed by international designers. The visible examples are mostly linked to Shennan Road.

In the mid-1990s, the municipal government of Shenzhen decided to move the city center westward to Futian. The work started in 1996 but was only completed in the 21st century, as discussed in the next session. Based on Singapore planner Meng Ta Cheang's master plan, the successful theme park named Splendid China not only created a new style for Chinese theme parks but also brought huge benefits to the OCT Group. Specifically, Splendid China promoted the development of other projects in the OCT, and many large construction projects, such as the Huaxia Art Center, the Folk Culture Village, and He Xiangning Art Museum, were launched simultaneously. Meng belonged to the first group of Singapore architects who entered the Chinese market. He discarded the monumental style in planning and applied a human perspective to a series of urban designs in Shenzhen.

In 1994, the 25.6 km-long and 135 m-wide avenue was completed and lined with dozens of skyscrapers and various large-scale commercial and cultural buildings. The main development concentrated in the Caiwuwei Financial Center and the OCT. With the introduction of foreign capital, foreign architects, mainly ethnic Chinese architects (including architects from Hong Kong, Macao, and Taiwan) began to participate in landmark projects (see Fig. 5).

In September 1992, Shenzhen led the organization of an international tender for land use rights in China, which opened the prelude to the reform of the land use system. In December of the same year, the design scheme of Shenzhen Diwang Building was tendered in Hong Kong and won by American Architectural Design Company Limited. In less than three years, the Diwang ("land king") Building was built in the Caiwuwei Financial Center. The 383 m-high building became the tallest building in Shenzhen and even Asia, replacing the previous tallest building International Trade Center (1986). It was China's first super high-rise building with a steel frame structure. It was representative of the second-generation skyscrapers in mainland China. In addition, the American Chinese architect K. Y. Cheung created a building with a slim profile: the width-to-height ratio was 1:9, which exceeded the width-to-height ratio of 1:5 specified in China's conventional regulations. Architects and structural engineers from the US and Japan solved the problem by consolidating the stiffness of the structure. The main contractor of the building was the Kumagai Gumi Group from Hong Kong. The structure was designed by Maunsell Consultants Asia, Ltd. from Hong Kong and Nippon Steel from Japan, who built the Bank of China of Hong Kong and the Republic Building of Singapore. Other than architectural design, we see the involvement of international forces. For example, the mechanical and electrical design and quantity surveying groups were companies based in Hong Kong. This project along with foreign investment saw not only special design concepts and shapes but also

Figure 5 Representative buildings designed by foreign architects along Shennan Road in the 1990s.

refreshed high records, advanced structural details, promoted new material selection, used the most advanced mechanical and electrical equipment, and standardized production processes and engineering management.

During this period, foreign architects were largely accompanied by foreign capital, and many of them were selected by foreign investors. At the beginning of the establishment of the Shenzhen SEZ, Hong Kong businessmen were the first group of "foreign capitalists." With over 20 years of economic development, Hong Kong has always been the "main force" driving Shenzhen's foreign investment. Moreover, the advantages of geographical proximity and having the same language explain why Hong Kong and ethnic Chinese architects were popular at that time. The active architects and design firms included Sherman Kung, Ho & Partners Architects, and Liang Zhaoru Architects. Hong Kong architect Sherman Kung was active in the construction of the OCT. He designed the He Xiangning Art Museum. Kung worked for Richard Meier in New York for nine years and used design methods similar to Meier's (Fig. 6).

The introduction of foreign architectural design strongly affected the trajectory of Chinese architecture. This trend was first introduced in Beijing and Shanghai by large firms from the US and Japan in the 1980s. In the 1990s, international design penetrated Shenzhen through the above projects. This development made the design market highly competitive and local firms' life increasingly tough. Nevertheless, it provided Chinese architects an opportunity to learn at a near distance. On the one hand, foreign and Hong Kong firms set up branch offices. On the other hand, state-owned and private design firms have grown in the market.

5. Period 3 Global time: 2001—present

Short noted that organizing large events and spectacles is an easy way for a city to construct and maintain globalization and modernity (Short, 2012). In the beginning of the 21st century, China entered the World Trade Organization and hosted the Olympic Games (Beijing), Asian Games (Guangzhou), Universiade (Shenzhen), World Expo (Shanghai), China—Africa Forum and other events. All these events demonstrate the country's global ambition. Shenzhen led the country's urban construction in the 1980s, but the leading role was gradually shifted to Shanghai in the 21st century.

Shenzhen felt the crisis. It prepared for joining the global games even before the 21st century. In 1996, the government took Futian Central District as the base of its new development. From 1997 to 1998, the Shenzhen Municipal Party Committee and the Shenzhen Government solicited bids for designs of six large infrastructure projects in Futian Central District that were part of a detailed planning scheme for the city's central axis (Chen, 2015a, 2015b). In 2004, with the opening of the subway, the city center gradually moved westward. Futian Central District, which spans the north and south of Shennan Road, is the site of the most intensive government investment in public buildings and commercial centers. More than half of the planning and landmark buildings were designed by foreign architects, including many celebrity architects. In the 10 years after 2004, as Futian Central District matured and other urban renewal projects such as Huaqiangbei and Caiwuwei began, the two sides of Shennan Road became

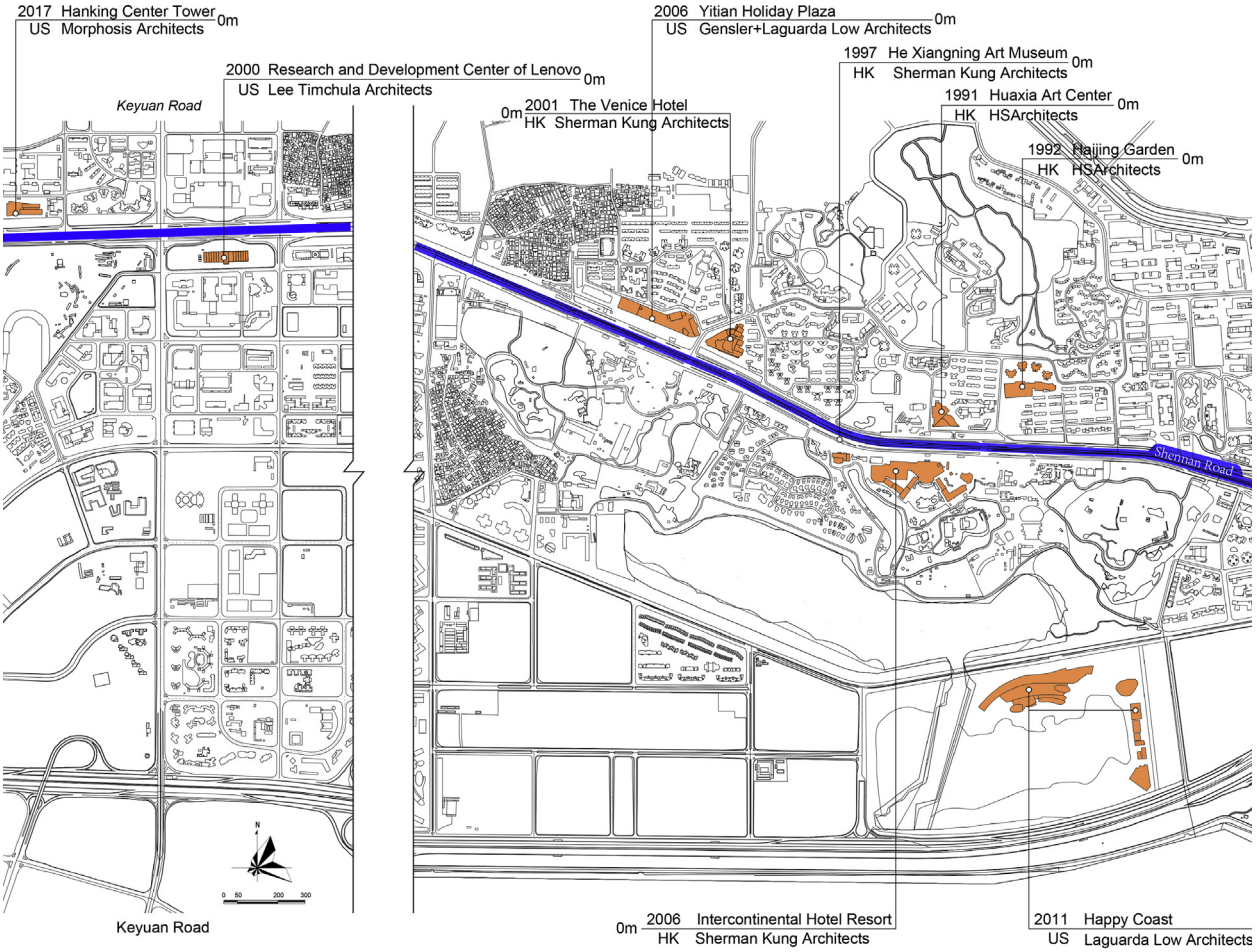


Figure 6 Nanshan District: Buildings designed by foreign architects along Shennan Road completed in the 1979—2018 period. Drawn by the authors.

the canvas of European and American architects, with more than 25 European and American designers being involved in these projects. By 2010, Shenzhen completed the construction of the new administrative center, the cultural buildings, and the densest rail lines and their stations (Fig. 7).

As the 21st century approached, the Shenzhen government and corporations accumulated wealth. They deeply benefited from China's opening policy and were ready for the era of globalization. Foreign and Hong Kong design firms began to set up offices in Beijing, Shanghai, and Shenzhen. Design competitions for landmark cultural buildings were held in first-tier cities. Several competitions, such as the one for the National Theater in Beijing in 1999, became the subject of social events and debates. Through media promotion, the general public became interested in major building images and events in the city (Xue, 2006b, 2019).

The Futian Central District competition was the first international competition for a CBD. Its influence on other cities in China can be seen in the new general planning model for Chinese towns. In this planning model, cultural buildings are clustered near the city's administration center, and the layout is based on orderly aesthetics. In addition, the planners attempted to create a political and cultural center on an axis so that the main buildings were designed to satisfy political tastes (Meng et al., 2016). This urban aesthetic is rooted in China's traditional forms of political power. The plan for the Shenzhen Futian Central District adopted the traditional Chinese layout of a central axis, which stretched 2 km from Lianhua Mountain in the north, through the Civic Center, and to the Exhibition Center in the south. A podium for pedestrians was built in the axis from the civic center toward Lianhua Mountain. However, due to the shelving of the "Crystal Island" project in the road junction, this axis was blocked by the 160 m-wide Shennan Road. The public cultural facilities are mainly located along both sides of road to the north of the central axis. The central axis system was designed and elaborated in 1997 by Kurokawa Kisho, a Japanese modernist master. The north central axis stretches from the southern foot of Lianhua Mountain and the rooftop platform of Shenzhen's Central Book City to the platform of the Citizen Center. This central axis concept (or ecological corridor) has been duplicated in numerous new towns/districts in China, such as Guangzhou's Pearl River New City and Hangzhou's Qianjiang New Town.

At the heart of this central axis lies the Civic Center designed by the American firm John M. Y. Lee/Timchula Architects, which won the international design competition in 1996. Shenzhen is called "the city of roc." The design of the 435 m-long Civic Center represents a roc flapping its wings. Lee, a graduate of Yale University in the 1950s, was

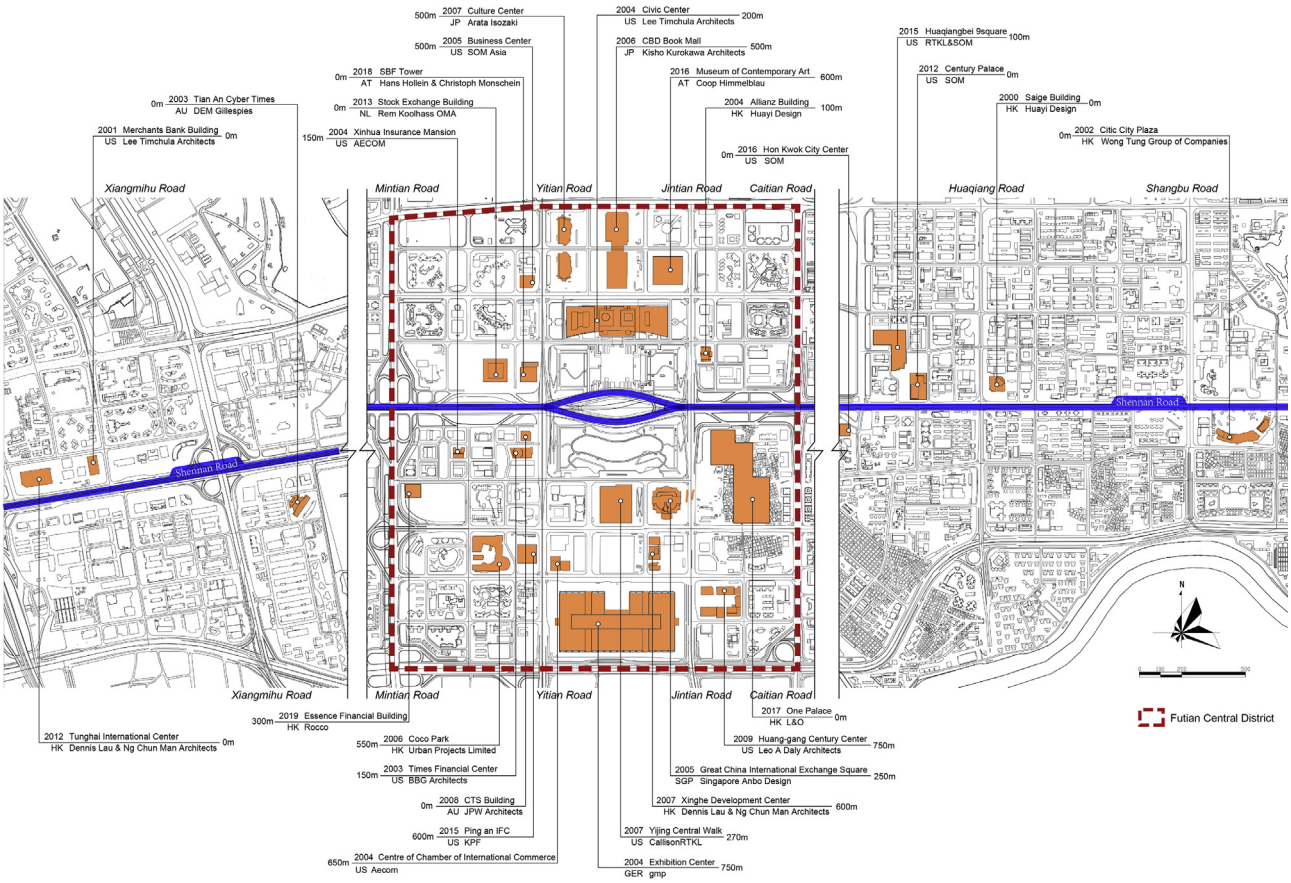


Figure 7 Futian District: Buildings along Shennan Road that were designed by foreign architects between 1979 and 2018. Drawn by the authors.

an assistant to New York architect Edward Barnes (1915—2004), who built a series of modernist works in the US. The roc-wing design of the Civic Center was the first iconic building in the new city center, and the final building was considerably different from John Lee's design. The long roof truss, shaped like a dinosaur, was built in 1998, but the government did not have sufficient funds to clad it. It was finally clad with colorful metal sheets in 2004. After the success of the Civic Center, John Lee's firm designed other banks and office buildings in Shenzhen. Opposite the Civic Center and across Shennan Road stands the German firm GMP's Convention and Exhibition Center, which hosts high-technology expositions every year. Collectively, these buildings comprise the city's central axis perpendicular to Shennan Road.

After the confirmation of a master plan for the new urban center, other important cultural and commercial buildings mushroomed. For example, the cultural center designed by Arata Isozaki was the first project he won in an open competition in China, and it opened the Chinese design market for him. The gorgeous harp-like curtain wall design is not only an attractive façade but also introduces sunlight and outdoor vistas to the interior. The other striking idea in Arata Isozaki's design is the "Golden Glass Tree" entrance hall, which is a brilliant space containing five golden pillars that support the polyhedral glass roof. After a decade of construction, the Cultural Center overspent by 1 billion yuan (US$153 million) relative to the original budget. As steel structures were considerably rare in China 20 years ago, the steel structure for the "golden tree" was an experimental construction. The construction team cooperated with Japanese structural engineers to make the model and then confirmed every joint on site, hence the long construction time. Isozaki's design of a library and concert hall share a podium 6 m above the ground. It brings convenience for people strolling between the two cultural palaces. The podium and lobby of the concert hall see free weekend concerts by various artists and are thus bustling with people.

The fast urbanization brought Shenzhen a salient problem of "village in city," where many villages are surrounded by large-scale development before they become urban lands. The villagers use their own methods to build "illegal" 7—9-story buildings in the village. Given their relatively cheap price, many low-income workers rent units here, and villagers become landlords. Convenient shops and cheap restaurants automatically emerge in the villages. These "illegal" squatter areas supply living space for blue-collar workers close to their workplace on the one hand and become "ugly" enclaves in the urban development on the other hand. Caiwuwei is one of these villages in the city center next to Shennan Road. The government negotiated with the villagers for 20 years and acquired the land in the 21st century. Terry Farrell (HK) designed a complex of KK100 on the site. A 442 m-high glass tower soars from the podium. Above a shopping mall, dense residential units are

packed in a row, reminiscent of the old village. The residential units are partly compensated to the villagers and largely on sale. Shennan Road witnessed this drastic change from villages to skyscrapers.

China tried to follow the international financial practice in the early 1990s. In addition to Shanghai, one stock exchange is located in Shenzhen. Koolhaas/OMA's design of the Shenzhen Stock Exchange building in the new city center and Shennan Road consolidates the city's status of learning and catching up to Hong Kong. The design elevates the cantilevered stock exchange hall to the lofty 36 m-high level and provides an ample roof garden on top of the elevated podium.

The last vacant plot in the central axis perpendicular to Shennan Road was filled with an exhibition hall designed by Coop Himmelb(l)au from Austria; the project was completed in 2018. The celebrity architect's works are popular in China. His parametric designs have appeared in Beijing, Guangzhou, Changsha, Dalian, and now Shenzhen. In the heart of Shenzhen, the civic center and "book city" are in the center and are flanked by the library, concert hall, exhibition hall, and children's palace. They are also accompanied by many commercial high-rise buildings and terminate in the convention center. The government decision makers have become gradually convinced that good cultural facilities are necessary for a livable city. A livable city can attract heavy investments and talents. The central plaza between buildings measures more than 200 m wide. Part of the plaza is covered by trees, and most are exposed under the harsh southern China sun. Many people flock to the plaza on weekends, but the public space can be better designed with a human touch and fine grain.

In the 1990s, the international design brought China new design methods, languages, and technologies. In the 21st century, international starchitects' designs gradually placed Shenzhen in the world arena. Koolhaas, Himmeblau, and Arata are sought after worldwide. Today, their names and works appear in Shenzhen. They provide useful spaces for performing arts, reading, commerce, and exhibitions. They sometimes arouse the pride and confidence of local people and decorate the portfolios of municipal leaders. The decision makers in Chinese cities have gradually understood the usage of starchitects and compete buildings for excellence in the region and the country. Shenzhen, with its accumulated wealth in the past decades, has sufficient resources and determination to play the game to the utmost (Fig. 8).

6. Discussion: architectural means to be global

Hong Kong is one of the miracles of East Asia. Between 1841 and 2011, its population increased from 12,000 to 7.1 million. Its population multiplied by 500 over 170 years, whereas Shenzhen took only 30 years to accomplish this feat. Therefore, the planning and construction underlying the phenomenal expansion of Shenzhen can serve as a template for rapid urbanization. The most striking architectural phenomenon in Shenzhen's rapid urbanization is the excessive number of landmark buildings built over the past 30 years as part of the massive upsurge in urban construction. The land plots around Shennan Road sensitively reflect the zeal, and the developers all hope to showcase their achievements in this symbolic road.

The tallest buildings in Shenzhen, such as the "Electronic Building" and International Trade Center mentioned in the session of the 1980s, line both sides of Shennan Road. The 50 story-high International Trade Center once represented the highest standard of design and construction in China in the 1980s. Its aluminum curtain wall was first applied to high-rise buildings in the country. The two tallest buildings (the International Trade Center and the Diwang Building) are milestones in the development of skyscrapers in China. Starting with the Diwang building, designed by an American—Chinese architect, the tallest buildings in Shenzhen were designed by well-known foreign architectural firms, namely, the KK 100 building was designed by TFP Farrells and the Ping An Finance Center was designed by KPF. KK 100 and Ping An Finance Center keep a slender shape and introduce green technology. Their form and technology represent the standard of the 21st century (Fig. 9).

The perspective of cultural landmarks can also capture the evolution of the Shenzhen architectural style. Shenzhen

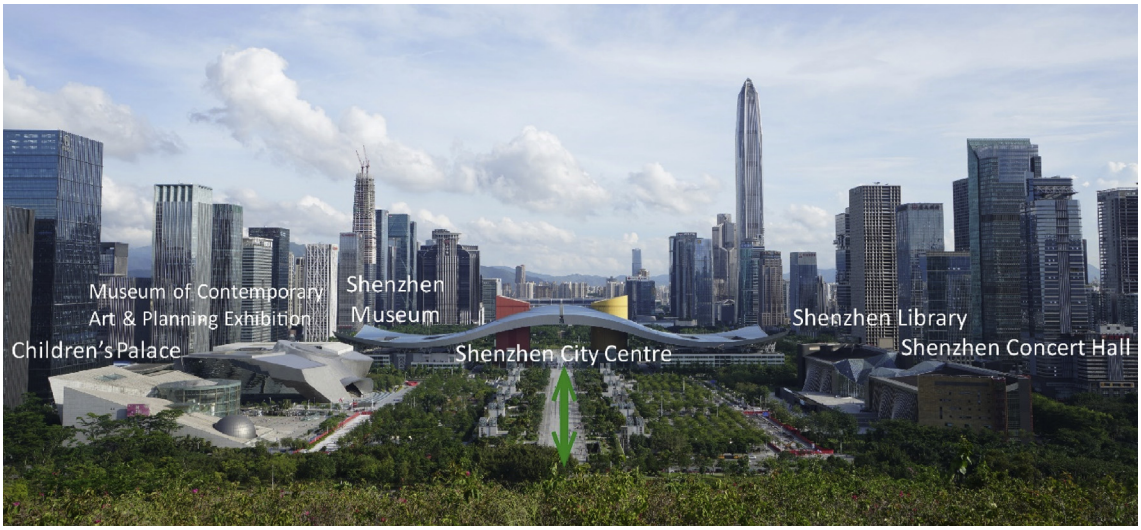


Figure 8 Futian Central District: Central axis. Shennan Road is perpendicular to the axis. Photo by the authors.

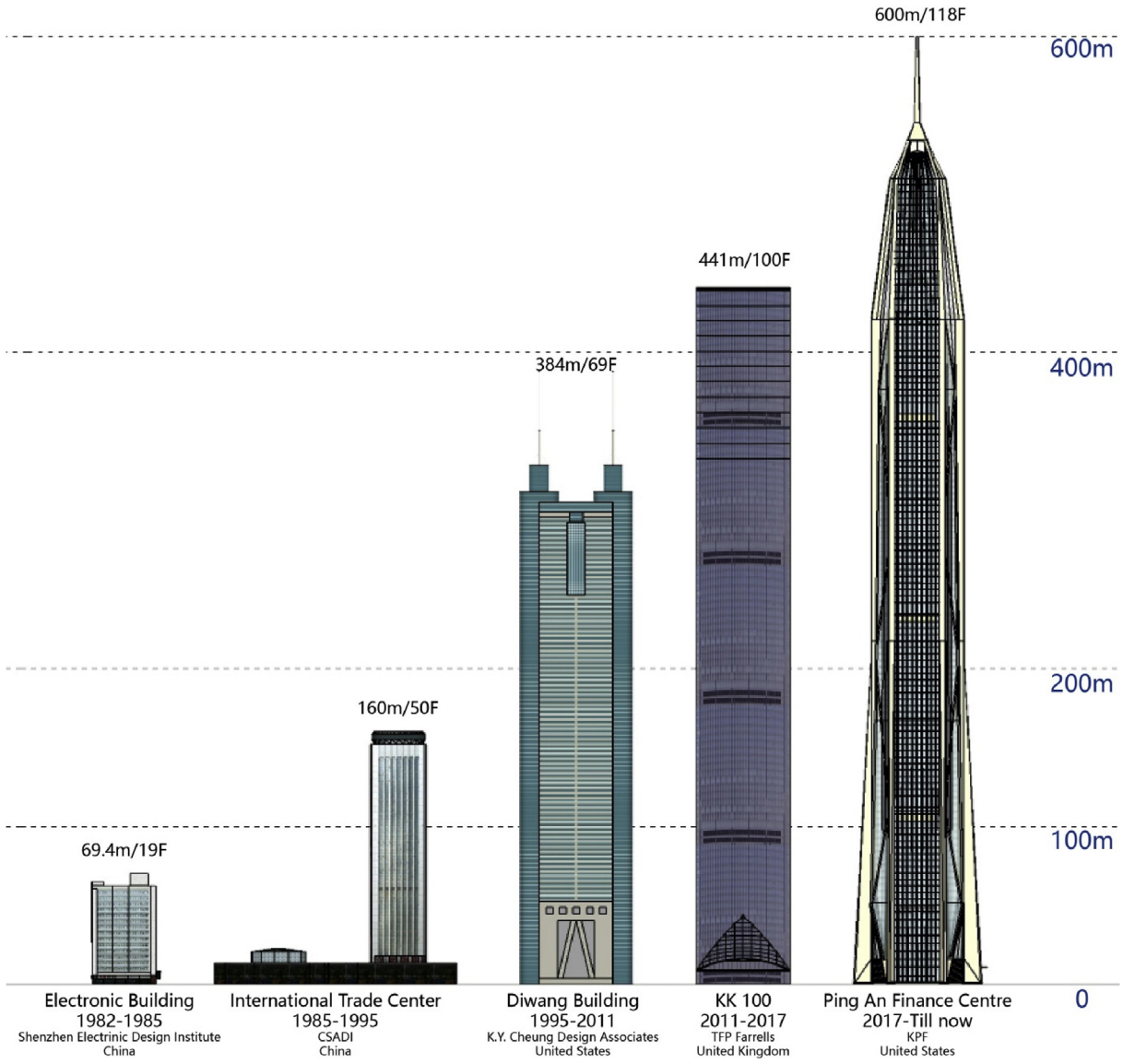


Figure 9 Evolution of Shenzhen's tallest buildings. Drawn by the authors.

has experienced three large construction booms of cultural buildings. Shenzhen Theater was born in the 1950s. It is a three-story box in a conservative style that only met the basic functional needs. In the late 1980s, Shenzhen Grand Theater presented the image of a new theater. The "Lingnan School of Modern Architecture" gradually waned as globalization evolved. In the 1980s, cultural facilities were planned to be distributed and did not form any axial order, and thus, their political feature was not clearly reflected at the planning level. Although the Huaxia Art Center of 1992 is classified as one of the new eight cultural facilities, its construction was a relatively independent event and is inseparable from the urban expansion and new group construction it emerged from. It represents an exploration of some advanced operations in that era. The architectural design style has a combination of Chinese and Western characteristics. The Shenzhen Concert Hall, which cost 1.7 billion yuan (US$ 2.2 billion), represents the theater design trend after the millennium, that is, a costly city landmark, which is a standard auditorium covered with an expensive, shiny "coat" (Sun, 2019). The Shenzhen Concert Hall represents the common planning model of new towns in China, where cultural buildings are built adjacent to administration center to shape a political and cultural center under the control of the axis. The design of cultural buildings first addresses aesthetic needs rather than the needs of the public. To win design competitions, architects try to determine what decision makers want and attempt to stand out through unique design and attractive implications (Fig. 10).

Shennan Road was no longer a common municipal road but a new business card representing China's urbanization. It often appears in the promotional pictures and videos of Shenzhen. With the introduction of international capital, foreign architects (including those from Hong Kong, Macao, and Taiwan) became involved in landmark projects. Most of the early-arriving architects were ethnic Chinese and Hong Kong architects. In 2004, with the opening of the subway, the city center gradually moved westward. Futian Central District, which spans the north and south sides of Shennan Road, was the site of the most intensive government

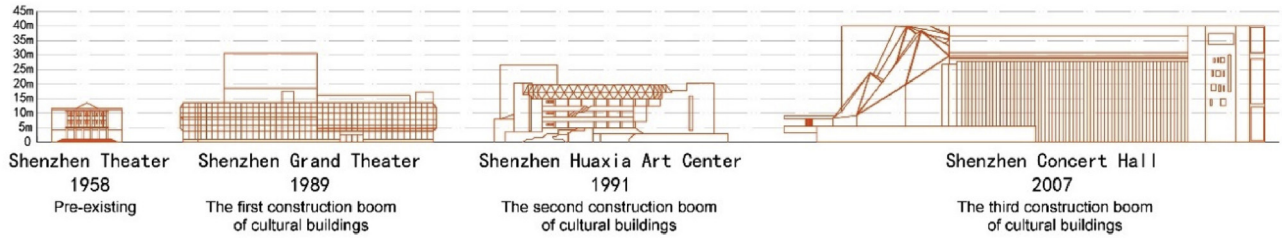


Figure 10 Comparison of the elevation scales of the major theaters of different periods in Shenzhen. Drawn by the authors.

investment in public buildings and commercial groups. More than half of the urban plans and landmark buildings were designed by foreign architects, including many celebrity architects. Overall, given certain large and small regrets, Shenzhen remains a place expressing the advanced ideals of urban planning and architecture.

Between 1979 and 2018, almost 90 of Shenzhen's new buildings were designed by foreign architects, and 46 of them are located along Shennan Road. If we examine both sides of Shennan Road (limited to 800 m from the centerline of the road), we can find that American architects account for 41% of the buildings, followed by Hong Kong and European architects, who account for 35% and 13%, respectively (see Table 1). In this period, American architects played a leading role in the city's urbanization process, far more than the designers from Europe and other Asian countries did. Large American design firms, such as Gensler, KPF, and SOM, have branch offices in Hong Kong. They can easily serve Shenzhen and southern China. The image of the American metropolis and the work of American designers are consistent with the Chinese idea of modernization. Moreover, Hong Kong businessmen have been the main force in the economic development of Shenzhen SEZ, especially its industrial development. Hong Kong businessmen brought not only capital but also relatively advanced ideas. The influence of Hong Kong architects and Hong Kong developers on the early stages of the architectural design of the SEZ was crucial. Foreign architects designed 54% of the large commercial and office buildings, 18% of the retail buildings, and 11% of the cultural buildings (see Table 2). In most cities, the landmark

Table 2 Types of projects designed by foreign architects. Graph made by the authors.

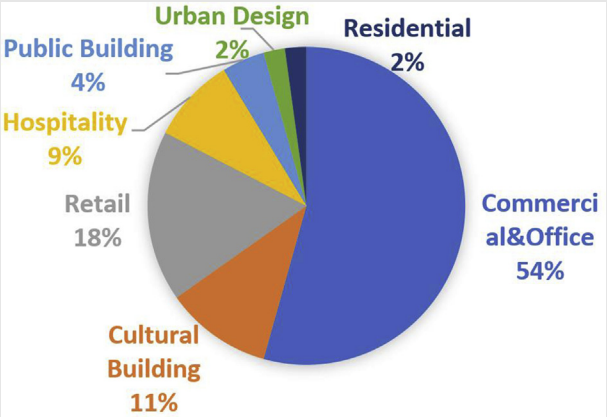
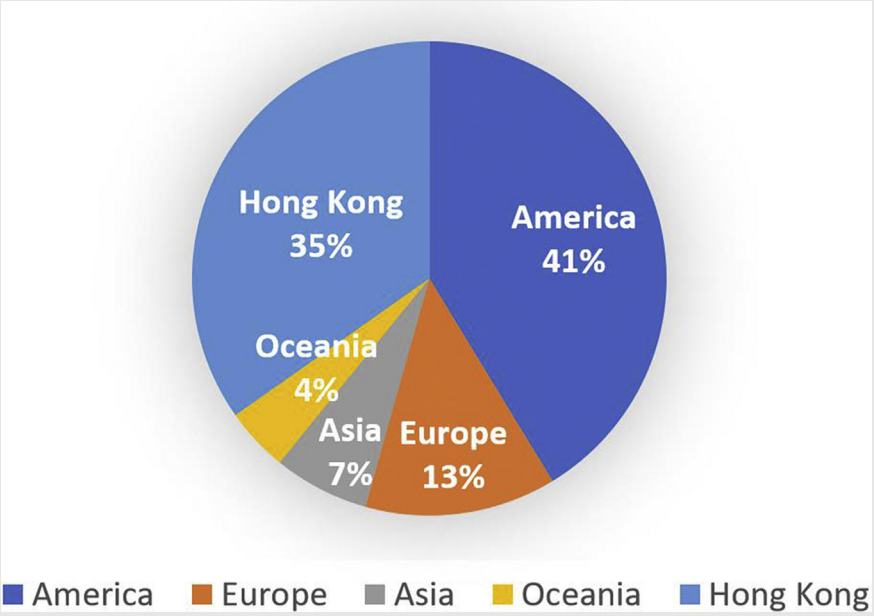


Table 1 Comparison of foreign architects' works by region. Graph made by authors.



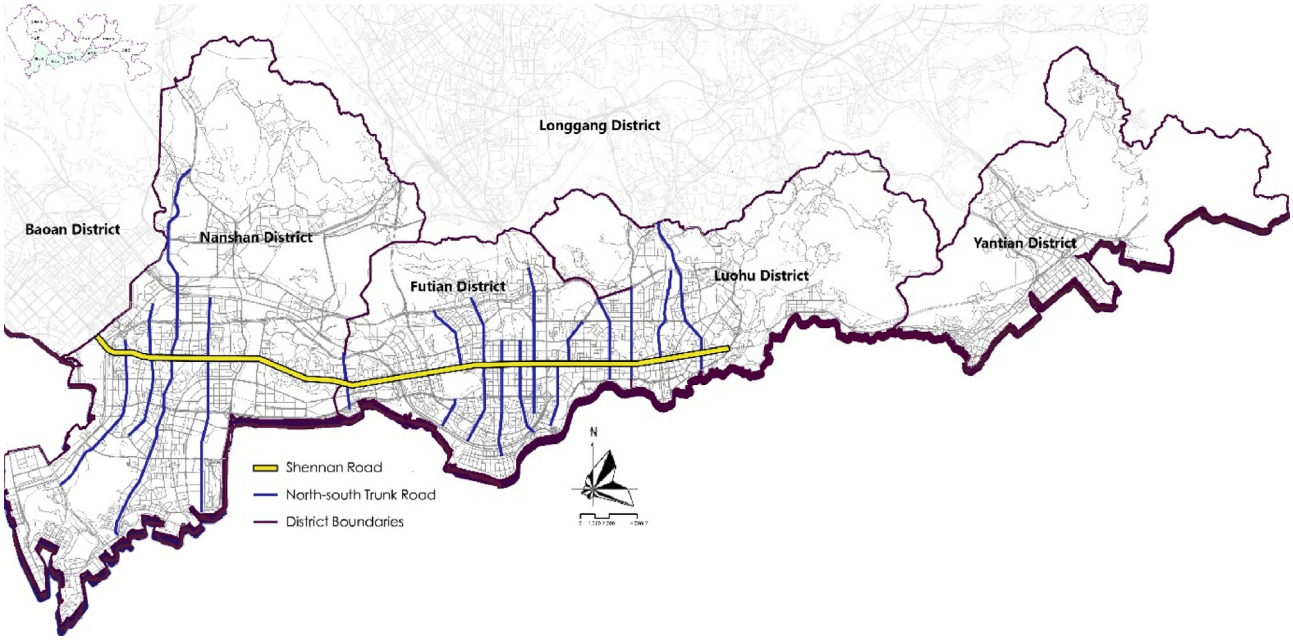


Figure 11 Potential of Shennan Road. Drawn by the authors.

buildings are commercial and office buildings. In Shenzhen, the developers and decision makers prefer foreign designers to bring new ideas and advanced technologies.

The above statistical figures reflect Shenzhen and other Chinese cities' anxiety in obtaining good and reasonable design. Similar to that in other cities, all investment from the public sector, from the opera house to the fire station, must be subjected to a design competition. Even for a primary school building, 30—40 interested design firms place bids. Shenzhen set up a Public Works Department, the only such kind of government department in China, to handle the design and procurement of public buildings. The department usually runs almost 200 projects simultaneously.[3]

Table 3 Architecture along Shennan Road in three periods.

	Representative buildings	Salient urban phenomenon that these buildings express
Period 1: 1980—1989 Early open door	International Trade Center, eight cultural buildings, especially Grand Theatre	Chinese Southern modernism, to be opposite to the official "national form", and pragmatic buildings to satisfy urgent societal demand.
Period 2: 1990—2000 Persisting in reform	Diwang Building, He Xiangning Art Gallery, and urban design of OCT	Architectural design based on rational urban design. Overseas design brings new methods and technologies.
Period 3: 2001—present Global time	Masterplan of Futian Central District(City's Central axis), SZ Cultural Center, Civic Center, Stock Exchange, and KK 100	Urban design in a large scale; starchitects' design of spectacles for the city's branding, consumerism and global ambition.

Shennan's role as an origin and a connection is exponentially strengthened because of the injection of investments, attention, and efforts. In the original second line of Shenzhen, 80% of north—south urban trunk roads intersected with Shennan Road. In the 1980s, Luohu, as an economic center, and Shangbu, as an administrative center, were connected by Shennan Road. When Futian Central District was planned in the 1990s, the administrative and economic centers merged. In the Universiade of 2011, Shennan extended across with the south—north main axis (Longgang and Longhua). It went west to connect the new district Baoan and went east to Yantian (Wang, 2016). Six city groups are hung on the road, separated by a green belt (Fig. 11).

7. Conclusion

This work briefly reviews the planning and building design along Shennan Road in the past 40 years. The road itself extends from a temporary one to a wide and long traffic trunk way. Buildings along the road have evolved from the Chinese "Lingnan School" modernism to the exuberant display of international architects. Shanghai took 100 years to achieve development, whereas Shenzhen achieved the same in 40 years. Office towers, theaters, libraries, stock exchanges, and other types of buildings serve society's needs in various times. They stand together along the road and are the silent testimony to Shenzhen's modernization.

[3] Through authors' interview with the Public Works Department, Shenzhen, 31 Oct. 2019.

The matrix in Table 3 summarizes the architecture along Shennan Road and indicates prominent cases and their implications.

From the 1980s to the 2010s, the concept of urban design, which guides individual buildings, has been given close attention. The building types have become increasingly diverse, ranging from functional commercial buildings to cultural facilities and from linear to parametric designs. This change was driven by the government's top—down leadership, the local people's strong desire for a prosperous life, planners/architects' wisdom, and resolute implementation in the public and private sectors. Through the wide tree-lined Shennan Road and clusters of functional or glamorous buildings, the government showcases its success, which was amplified by official aerial videos and CCTV broadcast in the Chinese New Year's Eve party viewed by billions of people. Private developers harvest profits through real estate properties close to the CBD or cultural district. International and domestic designers realize their professional dream and send their design statement to the world while middle class residents enjoy the diversified urban life. Turning Shennan Road to what it is today is a result of collective effort.

Whereas Hong Kong is famous for its financial business, Shenzhen has positioned itself as a high-technology design hub—"the capital of design." All these facts demonstrate that the border city is no longer an insignificant player but is bravely becoming a world city. Skyscrapers and cultural buildings along Shennan Road are not only the outcome of financial speculation but also powerful statements of Shenzhen's ambition to become a global city. The use of international architects and the most advanced design techniques are indispensable parts of such an aspiration.

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