The use of urban design principles to restructure public space - the example of Haizhu Square

Deng Zhaohua\(^1, 2\), * , Zhang Ganshen\(^2\), Wang Shifu\(^1, 2\)

1 State Key Lab of Subtropical Building Science, School of Architecture, South China University of Technology, Guangzhou, China;
2 School of Architecture, South China University of Technology, Guangzhou, China
* Correspondence: dengzhaohua@scut.edu.cn

Abstract

Public space in old city centre has been facing numerous challenges. Common urban design principles are rooted from environmental behaviour and environmental psychology, and are able to help meeting the new needs of the existing public space. This paper first explains some key urban design ideas towards public space improvement, including redirecting the traffic to support diverse urban functions, road crossing safety, sense of place and legibility, activity support, and local distinctiveness. It thereafter explores their potentials in improving a historic public space in Haizhu Square, Guangzhou. Design strategies include redirecting the traffic to support diverse urban functions, applying traffic calming measures to improve road crossing safety, restructuring corridors to strengthen the sense of place and legibility, using time and space management to provide multiple activity support, and reusing the existing materials to maintain local distinctiveness.

Keywords
urban design; public space; Haizhu Square
1. Introduction

Public space in old city centre is facing multiple challenges. Firstly, the fully developed situation of old city centre provides almost no room to fit in new public space, and the increasing demands of public space caused by population increases require innovative and adaptable strategies to explore the potential of the existing ones. Secondly, the settings of the existing public space may no longer meet the contemporary needs, and careful time and space management needs to guide the design strategy to support multiple functions. Thirdly, the ideology of pedestrian-first public space design is constantly challenged by transport engineering, and integrated design solutions are needed to achieve high quality public space while consoling transport engineers. This paper presents a case of public space improvement in Haizhu Square, Guangzhou. It reviews some key urban design principles rooted from people’s daily public life, and adapts the principles to explain how Haizhu Square can be transformed from an isolated traffic junction into an urban platform, which accommodates not only official events, but also daily leisure activities. The five key design strategies used include: redirecting the traffic to support diverse urban functions, road crossing safety, sense of place and legibility, activity support, and local distinctiveness.

2. What can we learn from urban design when improving public space?

Urban design concerns about the public realm, which in Noli map (a map showing the figure-ground relation) (Hebert 2016), is the void. This mainly includes streets and squares, with main concerns about the continuity of pedestrian movement and visual guidance. Bentley was believed to be the first to put together the Anglo-American urban design ideas into a synthesized Responsive Environments (Bentley 1985), with principles developed by Lynch (1981), Jacobs (1961), Cullen (1961), Rowe (1978) and others. The design ideas of legibility, variety, robustness, visual appropriateness, richness, personalisation, and permeability are of great help to improve place quality. The values of place quality then are revealed given their contributions to health, social, economic and environmental terms (Carmona 2019). Concerning public space itself, design guidance has been broadly researched and published (National Association of City Transportation Officials 2015). When coming to deal with the pedestrian-vehicle conflicts, the concept of traffic calming has been constantly applied. The following ideas are considered to be useful when improving the existing public space.

2.1 Making connections

Public space should be accessible, both in visual and movement terms (Németh and Schmidt 2011). Cullen (1961) provides an exemplar on using visual sequence to guide pedestrian’s movement, which has been broadly used nowadays. Permeable and accessible urban structure are thereby highly agreed in dealing with urban form (English Partnerships and Housing Corp. 2000). This is because pedestrian naturally needs visual guidance combined with direct
and safe path when navigating the urban space.

2.2 Place making

Successful place making are featured with strong sense of safety, comfort, diversity and attractiveness. First, the place needs to be attractive enough for people to stay, either by joining the designed activities, observing, having a rest, meeting people, or finding out the special story of that place (Ujang and Zakariya 2015). Especially when some special spirit of the place could be generated, emotional attachment can naturally help to generate an active space. Secondly, enclosure has been widely accepted as the form to generate active space (Carraz and Merry 2022). The street wall and place boundary can help users to generate a sense of belonging. Thirdly, as street crossing is unavoidable, safe pedestrian crossing with innovated means is highly needed. This could be done by conventional traffic light control, pedestrian bridge and traffic speed limit. But these hard measures are less efficient, when comparing to traffic calming measures, which considered to be pedestrian-first instead of vehicle-first.

2.3 Functional support

Multiple function is crucial to generate a successful public space (Ananian, Ebacher, and Perras 2022). This could be done by time and spatial scales, to allow different part of the space in different time frame to support various activities. This requires the environment to be responsive to the designated activities.

Despite the above common principles shared both in the West and the East, public space in China shows some special characteristics (Deng, Chen, Qin and Wang 2021). Different from eating simple lunch in lawn under the sun,

Fig 1. The original design of Haizhu Square in the 1950s (by courtesy of Guangzhou Archives)
Chinese prefer more to rest under tree cover to play chess, which may rooted from different lifestyles and weather conditions. This also raises another important principle of design - responding to the local custom and habit.

3. The values and problems of Haizhu Square

3.1 Born as a traffic junction

From the Historic Urban Landscape (HUL) (Ginzarly, Houbart and Teller 2019) point of view, Haizhu Square is right siting on the connection of Guangzhou’s Yunshan-Zhushui (Baiyun Moutain - Pearl River) urban structure. Haizhu Square was designed and built on the existing shop houses in late 1950s, the very beginning of new China. The main purpose was to use a modern roundabout (Fig 1) to connect the vehicle traffic from urban roads to the newly refurbished Haizhu Bridge (designated as a Historic Relic), which had been the only bridge connecting two sides of the Pearl River for decades.

Above the central junction, is the of Guangzhou Liberation Sculpture (designated as a Historic Relic); to the east and west sides of the central junction, are two piece of green land. The

Fig 2. “Red Culture relics” around Haizhu Square.
Top left: original site for Canton Fair; Top right: original site for Wuxianmen power station; Bottom left: original site for Yongan Tang; Bottom right: original site for People’s Commune (by courtesy of Guangzhou Archives)
Canton Fair site, Guangzhou Hotel, Wuxianmen Power Station, Children’s Library, People’s Commune site and other “Red Culture relics” are around. During the 1960s and 1970s, just before China’s Open-Up Policy, when Guangzhou was acting as China’s almost the only “open window”, Canton Fair with river transportation supported the location to be one of the most popular space in China.

But soon after the Opening-up, as most of the Chinese cities experienced, road and railway infrastructures upgraded and expanded, urbanization boomed, urban structure reformed as urban expansion and urban centre changed. Haizhu Square and its surrounding old city fabrics returned to support citizen’s daily lives, and became silent.

3.2 Rediscovering the opportunity

Haizhu Square is siting on river front, with heavy traffic routs surrounded. In urban design’s term, it is not an ideal place to support activities: a lack of enclosure by surrounding building form, open space cut into three individual parts and all separated from adjacent urban blocks.

To find out the potential revitalization of Haizhu Square, the design team used big data to compare its general cognition and its actual visit. The degree of general cognition was explored using Baidu search engine, by comparing the word search frequency of all the tourism and leisure spots in Central Guangzhou, through which the cognition heat map generated shows a high degree of cognition around Guangzhou old city, including Haizhu Square. The degree of actual visit used Dianping as the proxy, showing the actual online comments from users. The more comments indicate the more actual visits citizens made. The Dianping heat map shows that the old city demonstrates a less actual visits
than the new CBD. Haizhu Square shows a high online cognition but relatively low actual visit, demonstrating a good potential to revitalize (Fig 3).

Looking at the city’s urban structure, traditional axis district connecting Baiyun Mountain and Pearl River accommodates most of the ancient Guangzhou’s cultural relics, with significant cultural value. Its counterpart in the New CBD to the east houses the commercial uses, demonstrating Guangzhou’s ambition to be a top world city (Fig 4). Haizhu Square also has its advantage to be repopulated, given two metro lines meeting here, and its riverside position to provide a unique landscape spot.

4. Restructuring Haizhu Square

Given the constrains and potentials of Haizhu Square, the intention of turn it from a traffic junction to an urban platform was made (Fig 5). The primary design decision was made to move out the north-west vehicle lanes to form a pedestrian-only open space, connecting one anchor urban blocks and the Guangzhou Liberation Sculpture. Vehicle lanes were redesigned with traffic calming measures to fix the gaps between urban blocks, original roundabout, newly established national flag and the two pieces of green land. The co-existence of vehicle traffic and pedestrian movement requires careful means of traffic calming, and the loosely situated open space needs a thematic reorganization in meaning, visual and movement terms (Fig 6). Five key design strategies were thereby made: redirecting the traffic to support diverse urban functions, road crossing safety, sense of...
place and legibility, activity support, and local distinctiveness.

4.1 Redirecting the traffic to support diverse urban functions

Reorganizing the vehicle movements is crucial to support different functional needs. Based on the regional transport analysis, decision was made to transform the traffic roundabout into a multiple-street crossing place, and to move out the north-west vehicle routes. According to the functional needs, traffic management strategies could be implemented to support normal daily use, weekend functions and celebration functions, by expanding vehicle lanes cut-offs accordingly (Fig 7).
Fig 6. Proposed masterplan (Drawn by authors)
4.2 Road crossing safety

While keeping the necessary vehicle movements, pedestrian continuity was ensured by providing more path choices and reducing the road crossing distance. This was achieved by creating radiate view corridors and pedestrian paths, and by breaking down the one-time long-distance road crossing into multiple-time short-distance crossing (Fig 8). Measures of traffic calming were introduced to reduce vehicle speed by using rough stone shared surface. Instead of using conventional bumpers, rough surface can efficiently reduce traffic speed down to 30km/h, which provides drivers enough room to observe pedestrian movement and traffic light signals, hence to ensure pedestrian road crossing safety.

4.3 Sense of place and legibility

Sense of place was introduced by strengthening the “Red Culture”, including supporting the Guangzhou Liberation Sculpture to be in the central location, simplifying the shape of a silk cotton flower (Guangzhou’s city flower, also called “the flower of hero”) into a pentagonal figure as the prototype for landscape design, using radiate rays to redirect pedestrian movements and generate new visual corridors (Fig 9). The newly introduced national flag was carefully located in front of the Liberation Sculpture, in line with north-south corridor leading to Haizhu Bridge (Fig 10). By doing so, views from the square edges such as water front, surround urban blocks are guided towards the Liberation Sculpture with national flag in the front, and
“the flower of hero” also reminds people the “Red” background of square.

To strengthen the “Red Culture” a new set of environmental design and souvenir design were also prepared with the simplified silk cotton flower and the Liberation Sculpture, including urban furniture, handrails, souvenir and temporary decoration paintings (Fig 11).
Fig 10. Artist impression of Haizhu Square redesigned (Drawn by authors)

Fig 11a. Environmental design and souvenir design; left: handrails prototype (Drawn by authors); right: baluster (Photo taken by authors)
Recreating the old photo frame is a good way to echo the past story. Haizhu Square was once Guangzhou’s most popular scenic place in 1970s and 1980s, and are still in the good memory of the elderly (Fig 12). The radiate corridors towards the Liberation Sculpture regenerate the historic scene, with Guangzhou Hotel in the background, Liberation Sculpture in the middle ground and providing enough space for photo shooting.

4.4 Activity support

Time and space management is crucial to accommodate multiple functions in this unique location. A special event was introduced during the design process - national flag raising ceremony. This requires a prominent location to place the flag - before the Liberation Sculpture, preparing space for flag delivery - coming from Haizhu Bridge, and arranging enough space for audiences - before the flag (Fig 13). These were achieved based on special traffic management to turn the whole place into a pedestrianized zone at the time of ceremony. Location for Guangzhou Gardening Expo was also carefully arranged, located in the two pieces of green land. Using the radiate corridors to provide a sense of direction and to guide pedestrian movement, the new gardening exhibition was also helping to sculpture the new image of Garden City - Guangzhou (Fig 13).
Fig 12. Shooting photo from the same location
Upper left: photo taken in the 1980s (by courtesy of Guangzhou Archives).
Upper right: photo taken in the 1970s (by courtesy of Guangzhou Archives).
Bottom: artist impression of the renewed square (Drawn by authors)
Fig 13. A space for multiple activities
Top: Artist impression towards the national flag (Drawn by authors)
Bottom: Guangzhou Gardening Expo (Photo by authors)
Retaining the original citizen activities and introducing new ones were the design intention. Original activities were located within the two pieces of green land. Big trees with pools supported Cantonese opera, dancing, chess playing, and leisure sitting. Keeping the original trees and repairing the original furniture, with small modification according to the new theme, has been successful to continue to support the original activities (Fig 14).

4.5 Local distinctiveness

From a traffic roundabout to a pedestrianized square, the thematic figure has been changed from circle to pentagon. The original pavement underneath the Liberation Sculpture roundabout was large thick stones, which is valuable materials deserved to be reused. Decision was then made to rearrange the original stones to form the red cotton and pentagon figure, to allow the original materials to be shine again in the new place form (Fig 15).

5. Epilogue

Onsite reconstruction was completed within 6 months. On 1st October 2019, the 70th National Day, the flag-raising ceremony was held in Haizhu Square (Fig 16). Guangzhou Gardening Expo subsequently opened in the two pieces of green land. Pedestrian could now easily spot the direction, easily find ways to go through the square, have more willingness and choices to stay. These signals the successful transformation of the previous traffic junction into a multiple function public space. Credits are given to the initial design strategies, such as redirecting the
Fig 15. Changing the roundabout figures using the original materials
Left: cutting the original stones (Photo by authors)
Middle: designed pentagon (Drawn by authors)
Right: strategy to use the original material to form the new pavement (Drawn by authors)

Fig 16. Construction completed aerial view
Left: the first reopen day aerial view (Photo by authors)
Right: the flag-raising ceremony (Photo by authors)
traffic to support diverse urban functions, road crossing safety, sense of place and legibility, Activity support, and local distinctiveness. What is more important in this case, it shows the unlimited potential of public space in old city centre, if two issues are well articulated: the use of fundamental urban design principles to discover new opportunities, and careful management of time and space to support multiple functions.

Opportunities and challenges lie in the future, when the space underneath Haizhu Square is to be developed. How the underground commercial development could integrate with the existing metro structure while keeping accessibility in all directions, and would further connect the surrounding urban blocks while providing enough room to accommodate the long-waiting parking spaces, are still waiting for smart solutions.

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ORCID
Zhaohua Deng http://orcid.org/0000-0002-7409-0956
Shifu Wang http://orcid.org/0000-0003-3389-3987

Reference


