TOWARDS SAFE, INCLUSIVE AND
ACCESSIBLE PUBLIC SPACES

PUBLIC SPACE ASSESSMENT

JIANGHAN | WUHAN | CHINA

THE FIRST ASSESSMENT OF PUBLIC SPACES IN A DENSE URBAN AREA

武汉市土地利用和城市空间规划研究中心
WuHan Land Use And Urban Spatial Planning Research Center

UN HABITAT
FOR A BETTER URBAN FUTURE

DISCLAIMER

The methodology used in this report is based on the UN-Habitat's Global Public Space Programme City-wide public space inventory and assessment. UN-Habitat's City Prosperity Initiative uses the City Prosperity Index which is a sampling methodology and there is a difference in the data reported. The data is also based on time and day of the survey and may vary due to weather condition and user perception.

ACKNOWLEDGMENTS

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CHINA · WUHAN
JIANGHAN DISTRICT
A CITY-WIDE PUBLIC SPACE INVENTORY AND ASSESSMENT

武汉市土地利用和城市空间规划研究中心
WUHAN LAND USE AND URBAN SPATIAL PLANNING RESEARCH CENTER

UN HABITAT

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“Culture and climate differ all over the world, but people are the same.
They will gather in public if you give them a good place to do it.”

Jan Gehl

BACKGROUND

BACKGROUND

Public space plays a vital role as a structural element of cities. This fact has lead authors, such as Lynch (1960), Jacobs (1961), Portas (1968), Lefevre (1973), Borja (1977), to consider that "the city is the public space". It is therefore notable that public spaces plays an important role regarding formal, economical, social and environmental issues.

The quality of life in urban areas depends upon the availability of, and accessibility to social amenities. As such, high quality public spaces represent an excellent indicator of improved standards of urban life including physical and mental well being for all citizens. Public space provides a common platform through which city authorities, diverse groups including NGOs, CBOs the business community, academia and various government and intergovernmental agencies can collaborate and critically engage through a democratic process for sustainable development.

There is a need for public space to be created,protected and managed in a sustainable manner. The liveliness and continuous use of public space as a public good leads to an urban environment that is well-maintained and safe, making the city an attractive place to live, work and play.

It is noteworthy that public spaces play a fundamental role in the urban structure, holding important urban functions, allowing for the interconnection and coherence of different spaces, and contributing to the social cohesion and sustainability. It is therefore considered that public spaces should be planned and designed as a systemic network, i.e as elements of a large system, which is the city. The process of programming, planning and designing a public spaces network can represent a valuable instrument for the construction of cohesive and coherent urban spaces, presenting itself as an important tool for urban planning on a city level.

It is in regard of the growing attention to public space that in 2011, at the 23rd Session of the Governing Council of the United Nations Human Settlements Programme (UN-Habitat), member states were at the forefront in supporting the resolution that mandated UN-Habitat to consolidate agency-wide work on public space, to develop and promote public space policy, coordination, disseminate knowledge and directly assist cities in public space initiatives.

In 2012, UN-Habitat's Global Public Space Programme was established. Since then the Programme has grown to be active in a range of operational and normative activities in more than 30cities in over 20 countries.

A great milestone achieved in 2015 was the adoption of a target related to public space as part of SDG 11,

> "By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities".

In the spirit of the New Urban Agenda, adopted in 2016 during the Habitat III conference, public space has been reference to safe, inclusive, accessible, green and quality public spaces appearing no less than in ten discrete paragraphs. All this places the work of public space firmly at the center of the New Urban Agenda and achieving sustainable development.

This will require that cities, local and national governments invest in public space and should take a trans-disciplinary and multi-pronged approach, and work in partnership with diverse stakeholders and organizations to ensure adequate provision of inclusive, safe and accessible public spaces for all.

PROGRAMME FOCUS AREAS

The Global Public Space programme is organized around three main areas:

Partnerships and networking – An important part of the Programme is to bring together a broad global network of partners working on the issue of public space, and UN-Habitat has agreements and ongoing activities with various organizations. These partners are brought together annually at either the World Urban Forum and/ or the Future of Places Conference.

Knowledge management, advocacy and tools – To institutionalize public space in the normative work of partner organizations and cities, UN-Habitat promotes a policy approach, develops tools and indicators and runs capacity building programmes.

Public space demonstration projects and city-wide strategies – To show the importance of public space on the ground, UN-Habitat supports cities in implementing public space demonstration projects, city-wide strategies and sectoral development plans. These activities are strategic entry points for public space as well as for demonstrating participatory approaches to public space design, implementation, and management, allowing UN-Habitat to demonstrate the challenges encountered by cities in public space implementation.

Since the launch of the Programme in 2012, public space has gained traction as an important theme throughout UN-Habitat, among external partners and in cities on all continents.

Global Public Space Programme: 2016 Annual Report

CITY-WIDE PUBLIC SPACE INVENTORY AND ASSESSMENT

As mentioned earlier, public space plays a key role as the backbone of cities and in promoting social cohesion. It is therefore considered that public spaces should be planned and designed as a network that stretches across the entire city and not composed only of each isolated space (a square, a garden, a street, etc.), but also by the links between the different public spaces and the complementarity relations established between them. It is these linkages and complementarity relations that influence how people experience the spaces and also how they move within the city. But a city needs to first understand where they are to know where to go.

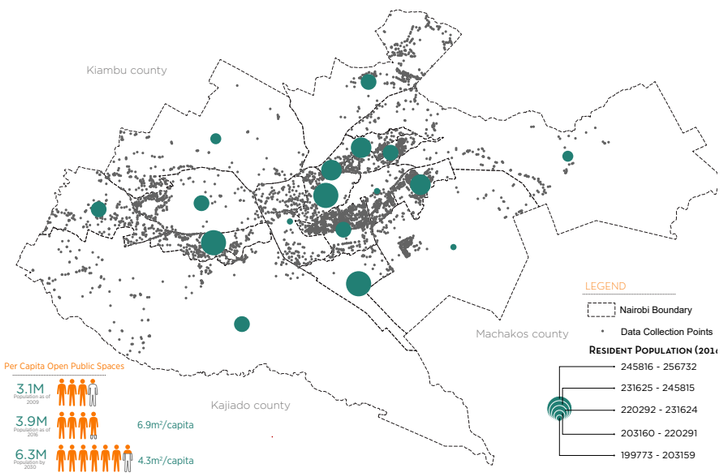
The process of creating this network of public spaces is often a top down approach since the starting point of view is the city scale descending, afterwards, to the neighbourhood and public space scale. To be able to understand public spaces at a city scale, UN-Habitat supports cities to collect information about public space, understand their problems and potentials at city scale. It is this kind of approach that makes it possible to promote social cohesion of urban space as well as community engagement. Knowing and understanding the characteristics of the city's public spaces network, it is possible to improve the relationships of continuity and complementarity between spaces.

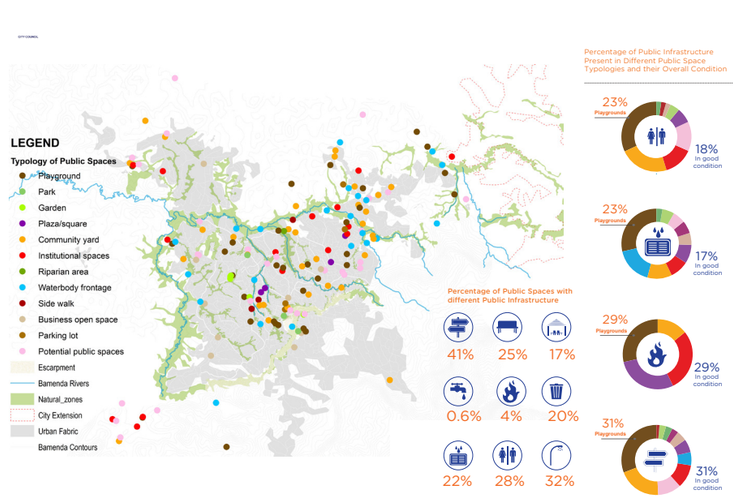
UN-Habitat's approach lets cities understand the distribution, accessibility, location, network and quality of their public spaces. This survey of public spaces brings out the possibility not only to restructure the existing spaces but also to develop new public spaces in city extensions so that they can create cohesive cities, promoting urban sustainability. The adopted data collection platform is called Kobo Toolbox which is an open source web and mobile based application.

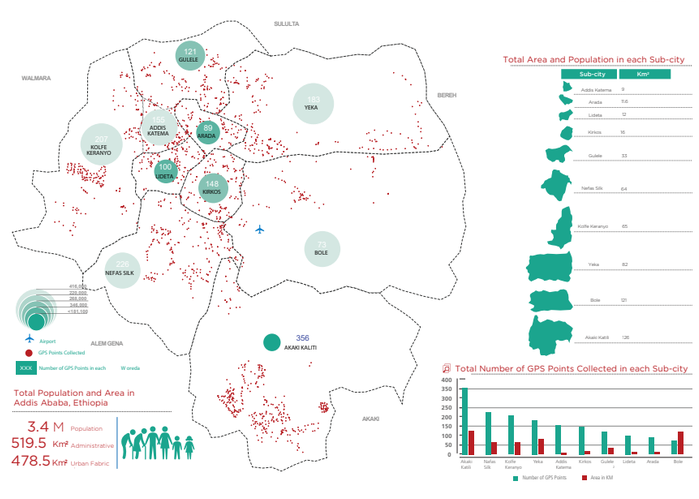
This is a participatory tool that allows the community to map their public spaces and take part in the analysis as well as propose strategies on how to improve their public spaces at a city scale. UN-Habitat has successfully supported 4 cities to map and assess their public spaces since 2016, but there is a keen interest from other cities to use this tool for their own city-wide public space strategy work.

The results of this city-wide inventory and assessment of public space not only provides a basis for the development of a city-wide strategy/action plan on public space but also defines the resources required for its implementation. The tool can be tailored to fit any context and assess the quality, distribution as well as child-friendly spaces and a variety of public space typologies, from open public spaces, public facilities or markets.

The tool is also key in monitoring and reporting on SDG 11.7.1 as it provides an indication of the share of built up area that is of public use by all, as well us towards the implementation of the New Urban Agenda.







WUHAN LAND USE AND URBAN SPATIAL PLANNING RESEARCH CENTRE

Wuhan Land Use and Urban Spatial Planning Research Center (WLSP), a public institution under the Wuhan Municipal Land Resources and Planning Bureau, is a research institute specialized in providing public welfare services related to land use planning and urban & rural planning formulations.

Driven by land utilization research, WLSP focuses on implementation-oriented planning by giving full responsibility to the "integration of urban planning with land resources management" and providing technical support to the state land resources management as well as professional technical services to governments and departments at all levels and to the public. So far, WLSP has successfully accomplished a series of land use, urban planning and policy-related research including evaluation of intensive land use for Wuhan college education and policy research. Other key programs of assessment include economic land utilization like the Wuhan urban-rural joint areas intensive land-use assessment pilot project, and Wuhan land saving and intensive use appraisal, improving the property right system of natural resources, deepening the research on water resources management, benchmarking land price updating, urban design for Wuhan statutory planning and planning for key functional zones under the directive of the Ministry of Land and Resources. Meanwhile, WLSP also undertakes overall planning with specific research, such as Wuhan industrial space planning, Wuhan metro planning, updating system planning of Wuhan city, Mapping Wuhan and so on. As many as 231 research achievements have been awarded with special honor by the national, provincial and municipal governments. It has been playing an important role in improving the construction of national central city and international metropolis of Wuhan City.

EAST LAKE GREEN WAY PLAN

The East Lake Green way plan is the first Chinese demonstration project with UN Habitat, which aim to improve urban public space and has been promoted globally at three international conferences.

The plan has gone through the "three steps" -- functional activation, landscape upgrading and transportation replanning to achieve the most celebrated Greenway. The vision of East Lake greenway system is "walking around the East Lake side and reading the fragrance city".

LANDSCAPE IMPROVEMENT OF ZHONGSHAN AVENUE

Zhongshan Avenue, which is close to the Metro Line 6 on Zhongshan road was closed for construction. The Air Defense Center, in accordance with the municipal government instructions, required the activation of old Hankou, and especially Renaissance Zhongshan Road Commercial Street, a street scape with historical and cultural heritage, and prosperity. The preparation of Zhongshan avenue to improve the landscape planning, follows the principles of "historical cycle, reproducing prosperity, revealing the details and providing livelihood".

Based on the principle of "people-oriented" and "transit-oriented", we can achieve the prosperity of Zhongshan avenue through environmental remodeling, cultural support and upgrading of urban form. At the same time, we will strive to create three important demonstration nodes of Delhi, art gallery and Jianghan Road, increase green space and pedestrian space, change the "vehicle oriented" traffic road to the "people oriented" living Street, and improve the quality of life for the citizens because of the street. "

UN-HABITAT AND WLSP

IN 2016

WLSP signed a memorandum of understanding with the then Executive Director of UN Habitat, Joan Clos.. The partners agreed to cooperate extensively in improving the urban public space and localization of the international guidelines for urban and regional planning. The “greenway plan of East Lake, Wuhan”, was identified as the first demonstration project of UN Habitat to improve China’s urban public space, and it was promoted globally at the three conference of human settlements.

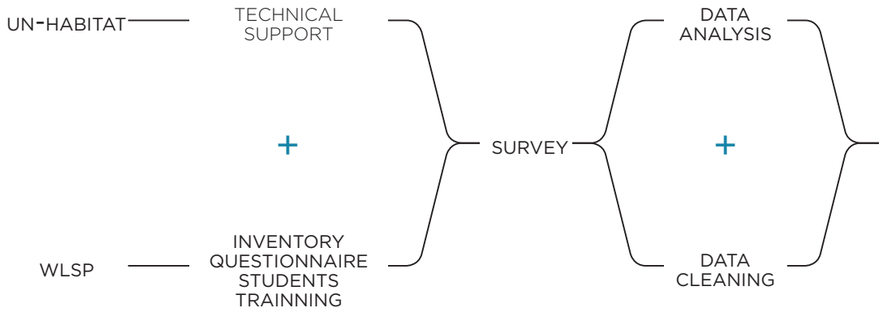
IN 2017

On July 24, 2017, Mr. Joan Clos launched the New Urban Agenda report in Chinese together with the Director of theWuhan Municipal Bureau of land resources and planning Mr, Sheng Hongtao and the vice mayor Wang Xiangwang. The China improvement of city public space project was officially launched and Mr. Joan Clos and director Hong Tao Sheng inaugurated the training base.

In 2017 the collaboration continued with the assessment of public space in Jianghan District and using Minecraft for the participatory design of two public space pilot sutes: Yao Lu and Jiang’an District

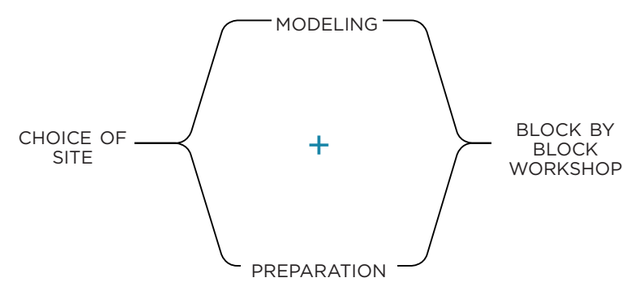
WORK PLAN

PROJECT ONE
OPS INVENTORY AND ASSESSMENT



Jianghan district will make a control plan combine with the report, and inclued the pand with “one-map” in Wuhan.

PROJECT TWO
BLOCK BY BLOCK



WLSP will transform the final model as a Implementation plan, and District government will do the construction

- Wuhan City
- Jianghan district
- Hitory of Public Spaces in Jianghan District
- Case for Public Space in Jianghan District
- Jianghan's Potential and Challenges

“People make cities, and it is to them, not buildings, that we must fit our plans.”

Jane Jacobs

INTRODUCTION

WUHAN, HUBEI PROVINCE, CHINA

1,920Km^2 Built-up area

8,494Km^2 Administrative area

10.6million 2015 population

11.2million 2030 population

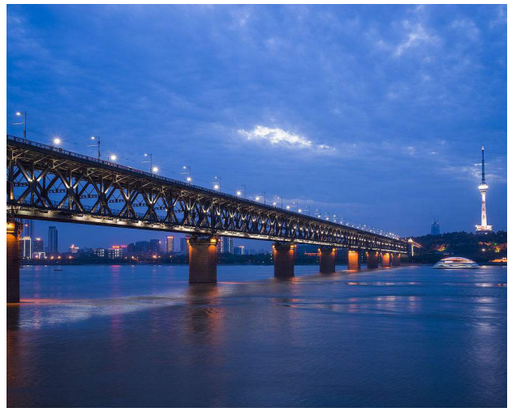
0.45% Growth rate

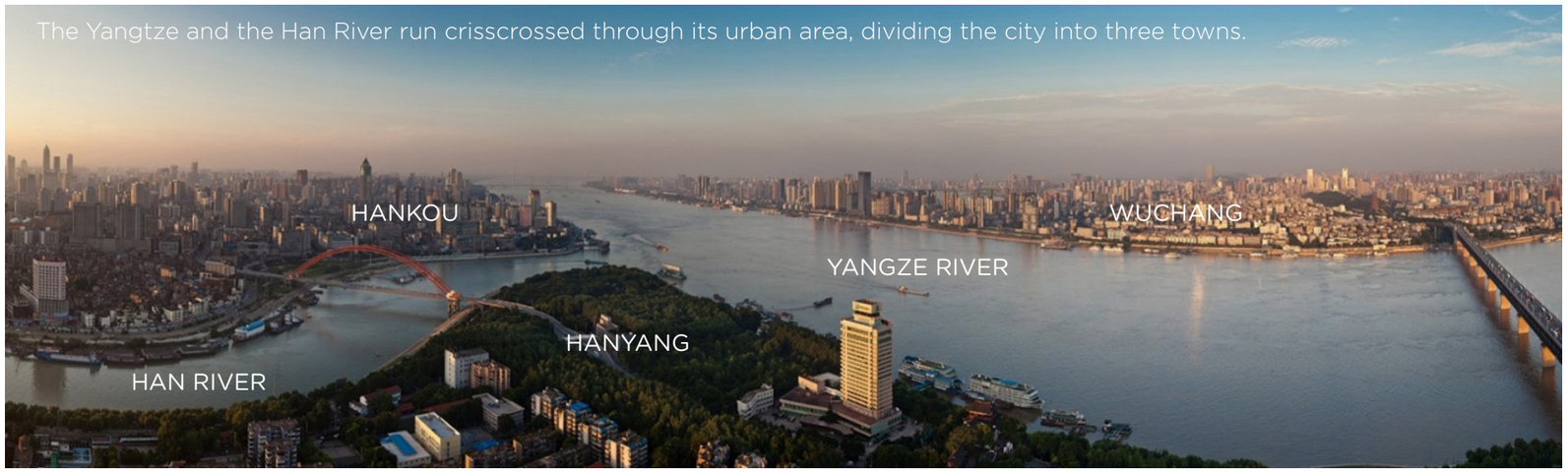
5,520 People / Km^2

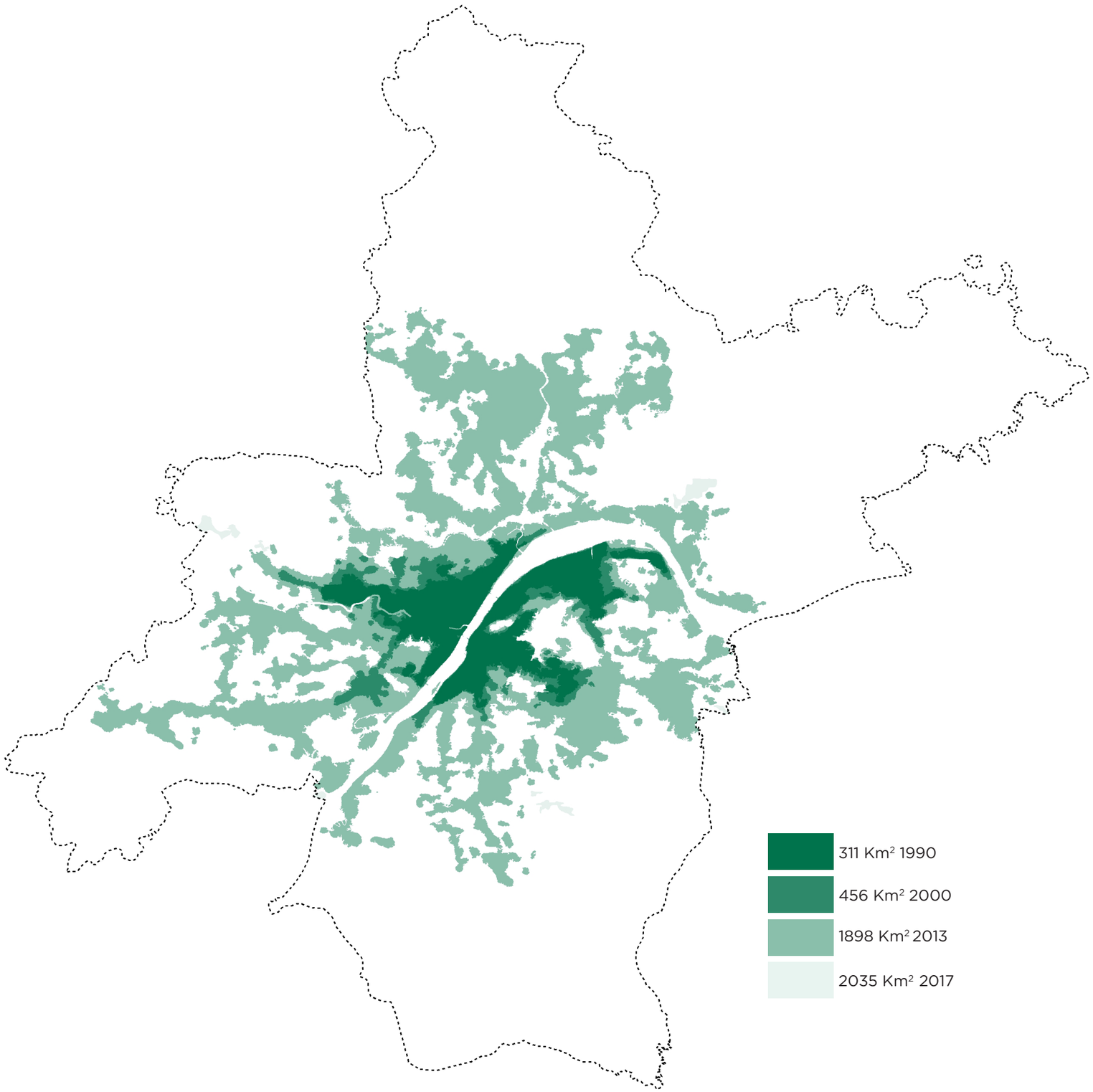
12.5% GDP growth rate

Wuhan is the provincial capital of Hubei Province and lies in the east of Jianghan plain at (113°41'E to 115°05' E and 29°58'N to 31°22' N). It is the most populous and largest industrial city in Hubei province and central China. Its resident population by 2015 was 10.6million and this is projected to reach approximately 11.2 by 2030. The geographical location of Wuhan creates a unique transportation advantage. At the intersection of the Yangtze River and its largest tributary, the Han River, Wuhan has historically been the thoroughfare to China's nine central provinces, and it is the hub for railway, road and water intersections. Wuhan will be one of eight megacities and the third largest city economy in China by 2025.In fact, in a global context, Wuhan is predicted to become the world's 15th largest metropolis by economic size by 2030.

The city contains many lakes and parks, including expansive, picturesque East Lake. But with the development in economic, increaseof population and urban expansion, has brought many social and environmental problems, such as the reduction of the function of the city structure, the pollution of the area and water environment. These problems have major impacts on people's mental and physical well being and overall quality of life.

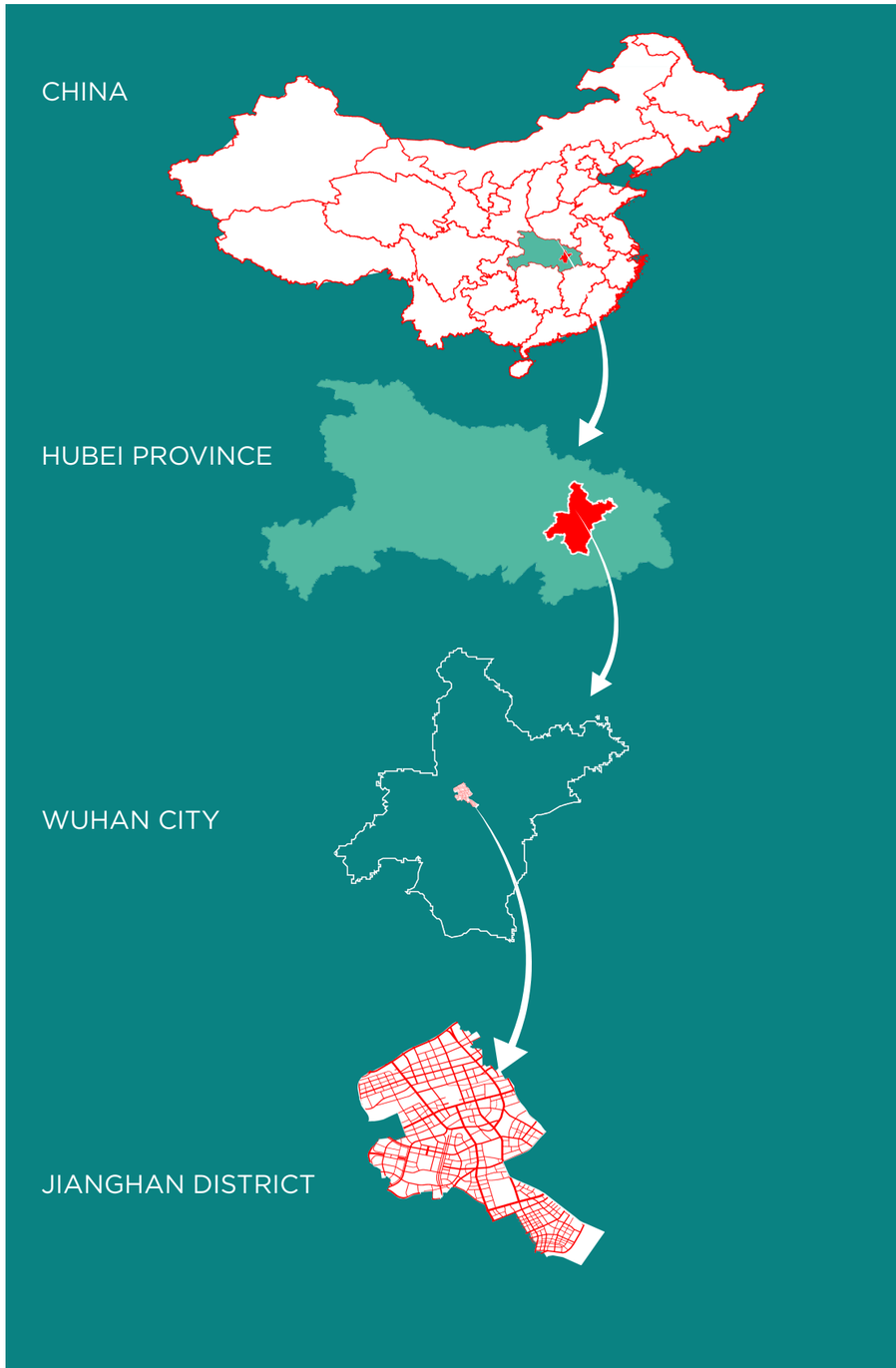






“Wuhan will be one of eight megacities and the third largest city economy in China by 2025”

-McKinsey



JIANGHAN DISTRICT A COMPACT AND DENSE CITY

Wuhan is comprised of seven urban districts and six suburban and rural districts. This study was conducted in Jianghan District-named after the intersection of the Yangtze River and Han River

Jianghan District is one of the 13 districts in Wuhan. It is situated on the northwest bank of the Yangtze River and its immediate neighbours are: Hanyangto and Wuchang to the south and Qiaokou to the west and Dongxihu to the north. The district covers a land area of about 28.3 square kilometres, about the same size as Macau or Manila. According to the 2015 Population and Housing Census, the district had a resident population of 680,000 accounting for a population density of 24,028 persons per square kilometres. This population is currently at 693,623 and is projected to decline to 550,000 by 2030. Jianghan is both the least spacious and most densely populated of the districts of Wuhan.

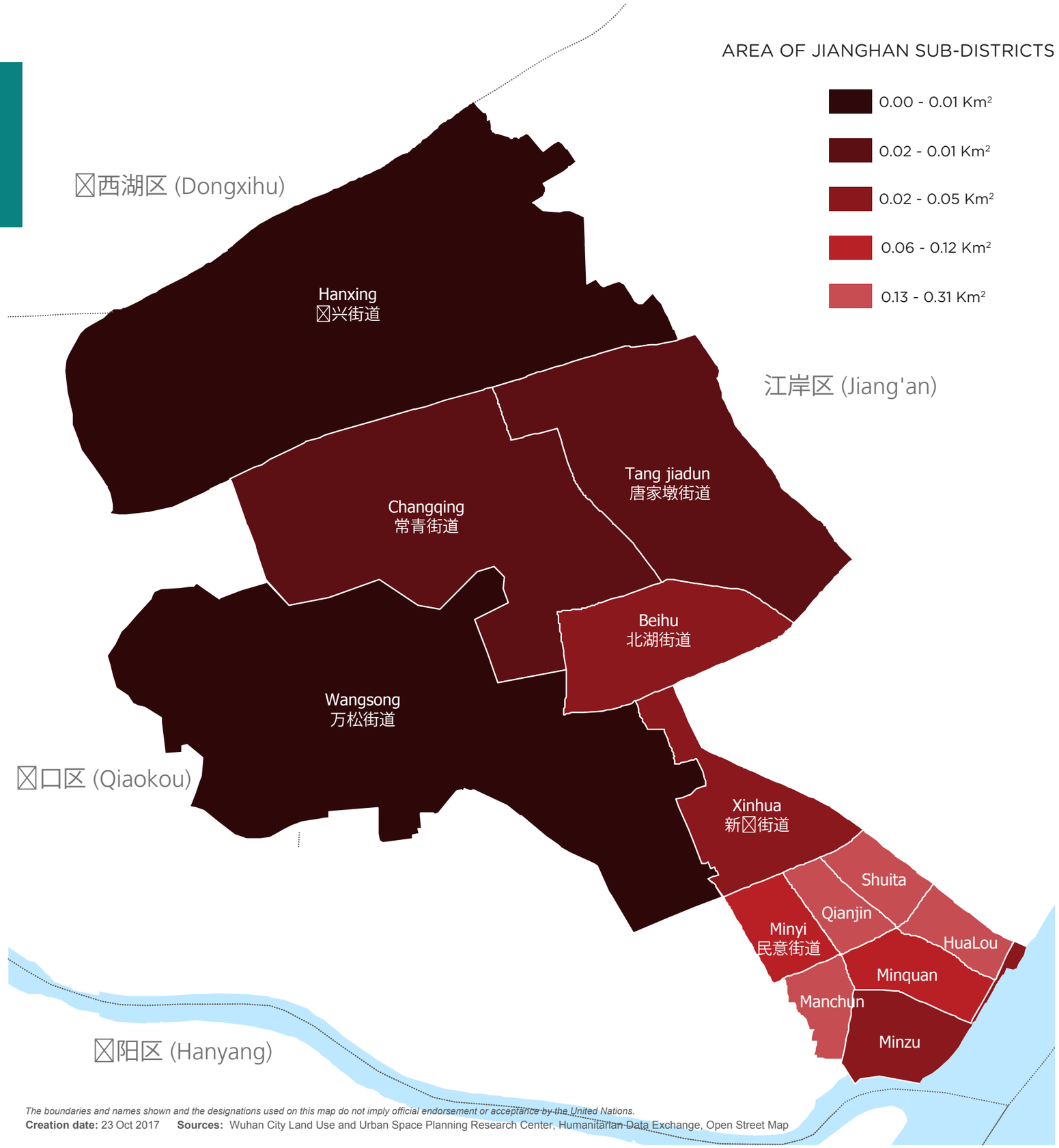
The district is characerised by an aging population and is also a shrinking district. This is a challenge but also an opportunity for the district and planners to re-imagine their district and its development. It is also a way of the district to recreate their public spaces and enhance their ecological function.

For administrative purposes, Jianghan is divided into thirteen (13) sub-districts, with Hanxing having the largest area of approximately 7.9 square kilometers, and 108 neighborhoods, a direct sub-level of a sub-district which is one of the smallest political divisions in China. The unit of analysis in this report is the sub-district level. The sub-district and neighborhoods of Jianghan District all have defined boundaries.

2015 - 680,000

2030 - 550,000

Aging population and Shrinking district

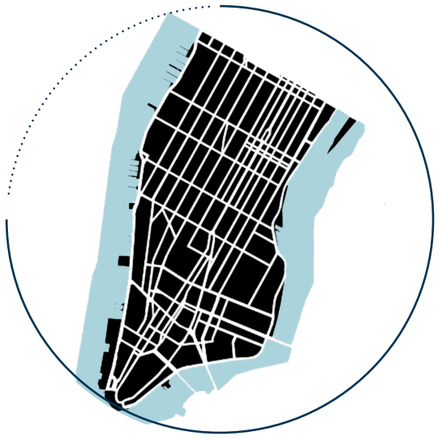


The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Creation date: 23 Oct 2017 **Sources:** Wuhan City Land Use and Urban Space Planning Research Center, Humanitarian Data Exchange, Open Street Map

COMPARISON WITH OTHER CITIES

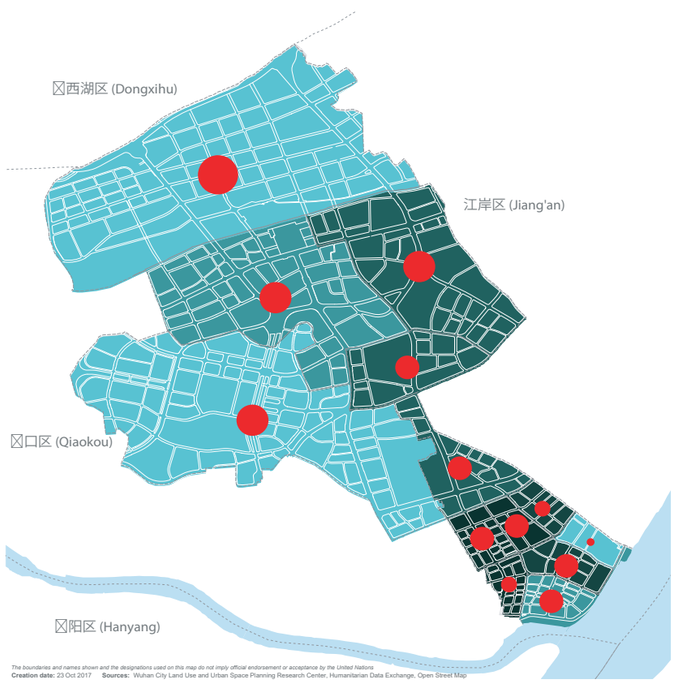
Paris
1st - 10th Arrondisements
23.3 Km²
468,000 Residents (2009)
20,085 residents / Km²



New York
Manhattan (South of Central Park)
22.8 Km²
612,000 Residents (2010)
26,842 Residents / Km²

London
Congestion Charge Zone
24.7 Km²
136,000 Residents (2004)
5,506 Residents / Km²

Wuhan
Jianghan District
28.3 Km²
687,422 Residents (2015)
24,290 Residents / Km²



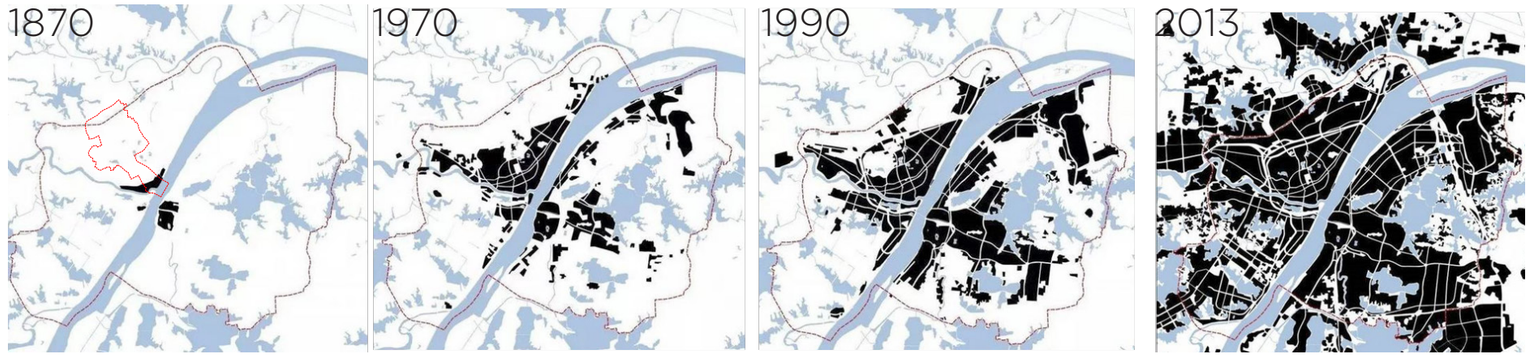
HISTORY OF PUBLIC SPACES IN JIANGHAN DISTRICT

Evidence shows the history of Wuhan can be dated back to the Neolithic Age, 6000 years ago.

The origin of Wuhan Three Towns—Hanyang, Wuchang, Hankou

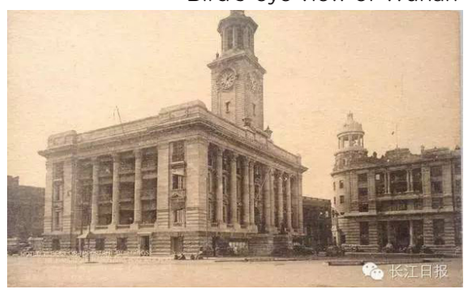
In Cheng Hua Period of Ming Dynasty, the Han River route changed, Hanyang town was divided into two parts, southern part is Hanyang, northern part is Hankou.

At the end of the Qing dynasty, Hankou had been developed as Xiakouting (equals administrative region—county), the name of three towns Wuhan has be used during the Qing dynasty and the Republic of China, the Tri—towns situation is quite unique.



Bird's-eye view of Wuhan

Bird's-eye view of Wuhan



Bird's-eye view of Wuhan

CASE FOR PUBLIC SPACE IN JIANGHAN DISTRICT

Zhongshan Park

Located by the Jiefang Avenue, Hankou, Wuhan, Zhongshan Park is one of the 100 famous historic parks in the country and a national key park. The Park covers an area of 328,000 ㎡, including 268,000 ㎡ of land, 60,000 ㎡ of water, with an overall green coverage of 93%.

Founded in the year 1910, Zhongshan Park has become a large-scale comprehensive park integrating leisure, recreation and amusement functions thanks to the hard work of several generations. Acclaimed as an “emerald” in one of the busiest commercial centers of Wuhan, the park receives more than 10 million visitors every year. Zhongshan Park boasts more than 219 varieties of plants, with a total of 5,281 trees and 50,016 shrubs (including those in hedges and flower beds), out of which 140 trees are under special protection.

The Park comprises the front, central and rear areas

The front area is a combination of Chinese and Western gardens, preserving the traditional Chinese garden style and historic buildings in major scenic areas.
The central area is a modern recreational and cultural area, with representative scenic attractions such as Shouxiang Hall, Zhanggong Pavillion, the bronze statues of Sun Yat-sen and Song Qingling, large music fountains and multiple groups of sculptures.
The rear area is a large-scale ecological amusement area with more than 40 programs, such as roller coasters, Ferris wheel, whitewater adventure, bumper cars, etc.

Current Situation

Thanks to its beautiful environment, Zhongshan Park is favored by people of all age groups. However, surrounded by buildings and with few entrances and exits, its accessibility and connectivity with the surrounding is relatively weak.

Planning Strategies

1. To demolish the road-front buildings along the edge of the Park so as to restore the view corridor, and realize the sharing of the green space by more residents.
2. To add more public road access and to enhance accessibility and visibility of park entrances.
3. To be linked with the Northwest Lake in the future, forming a city park.

JIANGHAN DISTRICT POTENTIALS

FANTASTIC SETTING

Jianghan has a magnificent location, at the confluence of two major rivers of China. This creates a unique transportation advantage. The City's water front is a important part of Jianghan's identity.

UNIQUE WATERFRONT

Uncover the recreational potential of Jinghan's waterfronts by ensuring its accessibility. This can be done through identifying key connections between the inner lakes and city to the Yangtze river.

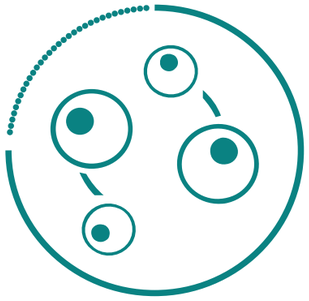
WALKABLE CITY

Jianghan emphasizes on walking as a viable mode of transportation. The street grids are well connected and this shows a potential for creating a walkable and sustainable city.

ECONOMIC STRENGTH

Wuhan has attracted foreign investment from over 80 countries, with 5,973 foreign-invested enterprises established in the city with a total capital injection of $22.45 billion USD. Wuhan is an important center for economy, trade, finance, transportation, information technology, and education in China.

JIANGHAN DISTRICT CHALLENGES



FRAGMENTED PUBLIC SPACES

Public spaces in Jianghan District are threatened by the expanding city structures, which have fragmented natural areas, creating small patches of public spaces in amongst buildings and roads.

LOW QUALITY & CHARACTERISTIC

The increase of urban environments in Jianghan District has left public spaces to be derelict and therefore decreasing public space's function.

INADEQUATE GREEN SPACE INDEX

Jianghan District falls short of standards set by the National Ecological city of 11m^2/capita as well as the international standard of 5m^2/capita. Total green public space is just 2.2m^2 per capita.

HIGH DENSITY AND LOW STOCK LAND

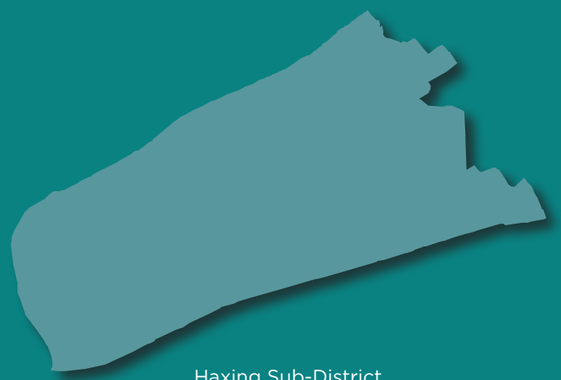
Jianghan is the least spacious and most densely populated of the districts in Wuhan. As the population increases, the supply of land in proportion diminishes. Jianghan needs to therefore make the best out of what is existing.

- Data Collection
- Data Clean-Up

“The proportion of urban areas dedicated to streets and public spaces is a crucial feature of the spatial plans of cities. Indeed cities that have adequate street and public spaces and greater connectivity are more livable and productive.”

Dr. Joan Clos

METHODOLOGY



Haxing Sub-District
7.9 Km2
138,438 Residents (2015)
17,571 residents / Km²
41 GPS data collected
Area of assessed public space
0.3 Km²

Wangsong Sub-District
7.1 Km2
89,860 Residents (2015)
12,630 residents / Km2
38 GPS data collected
Area of assessed public space
1 Km²

Changqing Sub-District
4.2 Km2
104,363 Residents (2015)
24,714 residents / Km2
30 GPS data collected
Area of assessed public space
0.26 Km²

Tang Jiadun Sub-District
3.1 Km2
89,824 Residents (2015)
28,527 residents / Km2
12 GPS data collected
Area of assessed public space
0.11 Km²

Minzu Sub-District
1.4 Km2
32,499 Residents (2015)
22,819 residents / Km²
10 GPS data collected
Area of assessed public space
0.04 Km²

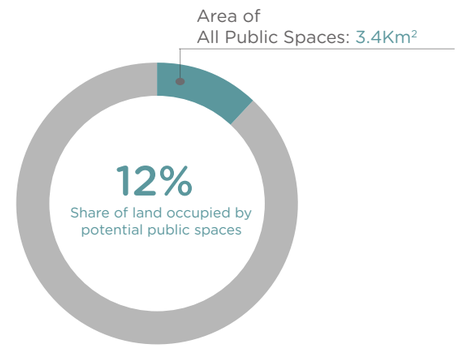
The data collection was undertaken using a structured questionnaire that was formulated to guide the classification and analysis of public spaces. This questionnaire was formulated by Wuhan Land Use and Spatial Planning Research Center together with UN-Habitat. The questionnaire was uploaded into the Kobo toolbox application where they were made accessible to surveyors. In addition to the questionnaire, maps were developed for easy identification of the public spaces as well as inclusion of new public spaces during the survey. Prior to the survey, the data collectors who were primarily university students were trained on the use of the data collection tool.

341 polygons were initially drawn as potential public spaces. 153 of the potential public spaces that were drawn were already coded with unique public space ID and were considered existing public spaces. These 341 polygons accounted for 3.4 Km² which is 12% share of the area of Jianghan District, showing a potential to expand the number of public spaces to counter the future population projections.

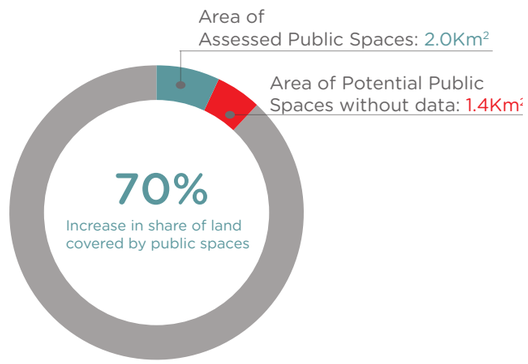
The 341 potential public spaces were then merged with 163 data points collected from the field and a total of 141 polygons were then obtained after the data clean up. This accounted for 2.0 Km² and 7.4% of the area of Jianghan District.

Jianghan has a potential to increase its area covered by public spaces to counter its current population growth as well as protect the existing public spaces.

AREA OF ALL PUBLIC SPACES



AREA OF POTENTIAL AND ASSESSED PUBLIC SPACES



Beihu Sub-District
1.3 Km2
38,056 Residents (2015)
30,386 residents / Km²
9 GPS data collected
Area of assessed public space
0.18 Km²

Xinhua Sub-District
1.1 Km2
32,547 Residents (2015)
30,015 residents / Km²
9 GPS data collected
Area of assessed public space
0.02 Km²

Minquan Sub-District
0.5 Km2
39,533 Residents (2015)
80,745 residents / Km²
3 GPS data collected
Area of assessed public space
0.001 Km²

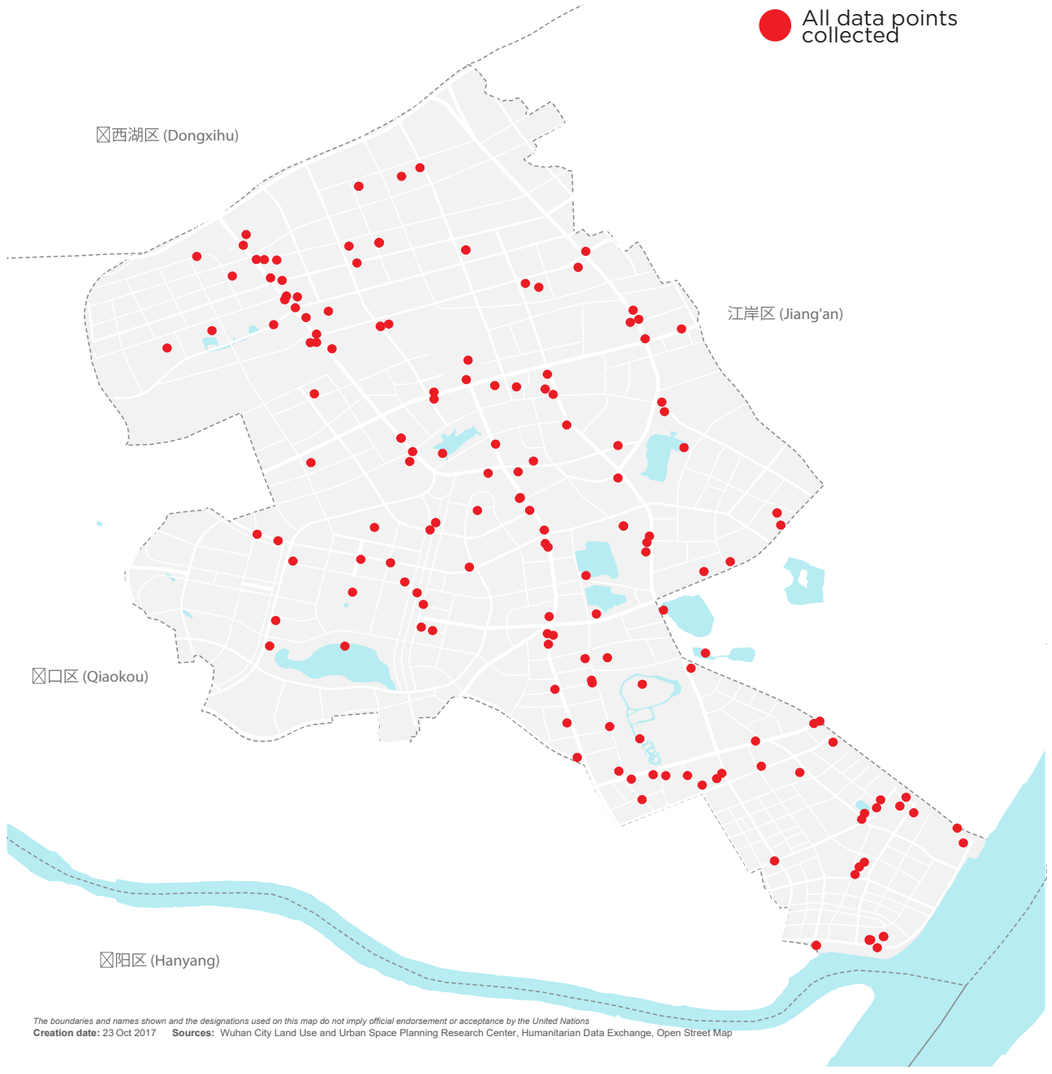
Minyi Sub-District
0.4 Km2
36,961 Residents (2015)
85,830 residents / Km²
0 data collected
Area of assessed public space
0

Shuita Sub-District
0.3 Km2
21,587 Residents (2015)
65,366 residents / Km²
2 GPS data collected
Area of assessed public space
0.01 Km²

Qianjin Sub-District
0.3 Km2
33,412 Residents (2015)
105,897 residents / Km²
2 data collected
Area of assessed public space
0.004 Km²

Hualou Sub-District
0.3 Km2
4,053 Residents (2015)
13,174 residents / Km²
6 GPS data collected
Area of assessed public space
0.01 Km²

Manchun Sub-District
0.3 Km2
26,289 Residents (2015)
88,700 residents / Km²
1 GPS data collected
Area of assessed public space
0.001 Km²



13
Sub Districts

163
Data entry points

141
Cleaned data entry points

The map on the left shows all the data that was collected in Jianghan District. The collected data was cleaned before data analysis was done. The cleaning was done in various stages and involved deleting multiple entries made for the same space, deleting data that did not have information, and deleting multiple entries in one polygon.

Out of a total of 163 data entries, 14 of them were found to be duplicate entries, 2 were outside the study area, 1 was overlapping with another point, 1 was in a polygon that already had data and 4 did not have polygons and were in areas where polygons could not be drawn. such as on top of a building A total of 141 points were then obtained for the analysis

ASSESSED PUBLIC SPACES

The overall goal of the open public space assessment was to establish the amount of land that is public space, but also the typology, quality, distribution and accessibility in Jianghan District. This will make a case for the protection of these spaces as well as monitoring and reporting on the Sustainable Development Goals. Public Spaces can be categorized variously. For the purpose of this assessment, public space was classified based on the data received and UN-Habitat's typologies of public spaces which are streets, open public spaces, public facilities and markets.

The equitable distribution of the spaces across the city is an important element of creating a cohesive city, balancing growth and revitalizing impoverished communities The assessment covered the 13 districts in Jianghan excluding Minyi sub-district where data was not collected or there is lack of public spaces. Majority of public spaces data were collected in Hanxing sub-district which had 41 data entries, out of these, 38 public spaces were assessed and Wansong sub-district which had 38 data entries and a total of 33 data points were assessed. The rest of the sub-districts had collected and assessed data points as follows Changqing sub-district (30 collected, 29 assessed), Tang Jiadun sub-district (12 collected, 11 assessed), Minzu sub-district (10 collected , 7 assessed), Beihu sub-district (9 collected, 8 assessed), Xinhua sub-district (9 collected, 8 assessed), Hualou sub-district (6 collected, 6 assessed), Minquan sub-district (3 collected, 1 assessed), Qianjin sub-district (2 collected, 2 assessed), Shuita sub-district (2collected, 2 assessed) and Manchun sub-district (1 collected, 1 assessed)

The total area of public spaces was found to be 2 Km^2.Out of these, open public spaces covered the majority of the area of all public spaces which is 1.61 Km^2 (81%). Public spaces along the street accounted for 0.16 Km^2 (8%) of all public spaces in Jianghan while public facilities covered an area of 0.015 Km^2 (0.8%) and markets covered an area of 0.003 Km^2 (0.2%). A surprising area of public spaces of 0.19Km^2 (9.5%) is covered by other public spaces such as spaces along business building frontage and potential public spaces. This further shows the potential of upgrading these public spaces into functional spaces.

The importance of public spaces and their impact on urban development cannot be ignored. Jianghan needs to put more effort in the design, management and protection of its public spaces to ensure a district that is livable and attractive. The per capita public space for Jianghan District is 2.9 m^2 this is expected to increase in 2030 where the population is projected to decline to 550,000 residents and will be at 2.8 m^2 per person.

Jianghan District has an important role to play in providing areas for public spaces for its residents. It is however, not just the amount of public space, but its quality, use, the process through which it is created,owned,maintained and its governance. It is therefore crucial to protect and revitalize the existing public spaces and upgrade the huge area covered by potential public spaces to ensure improved quality of life including the physical and mental well-being for it residents.

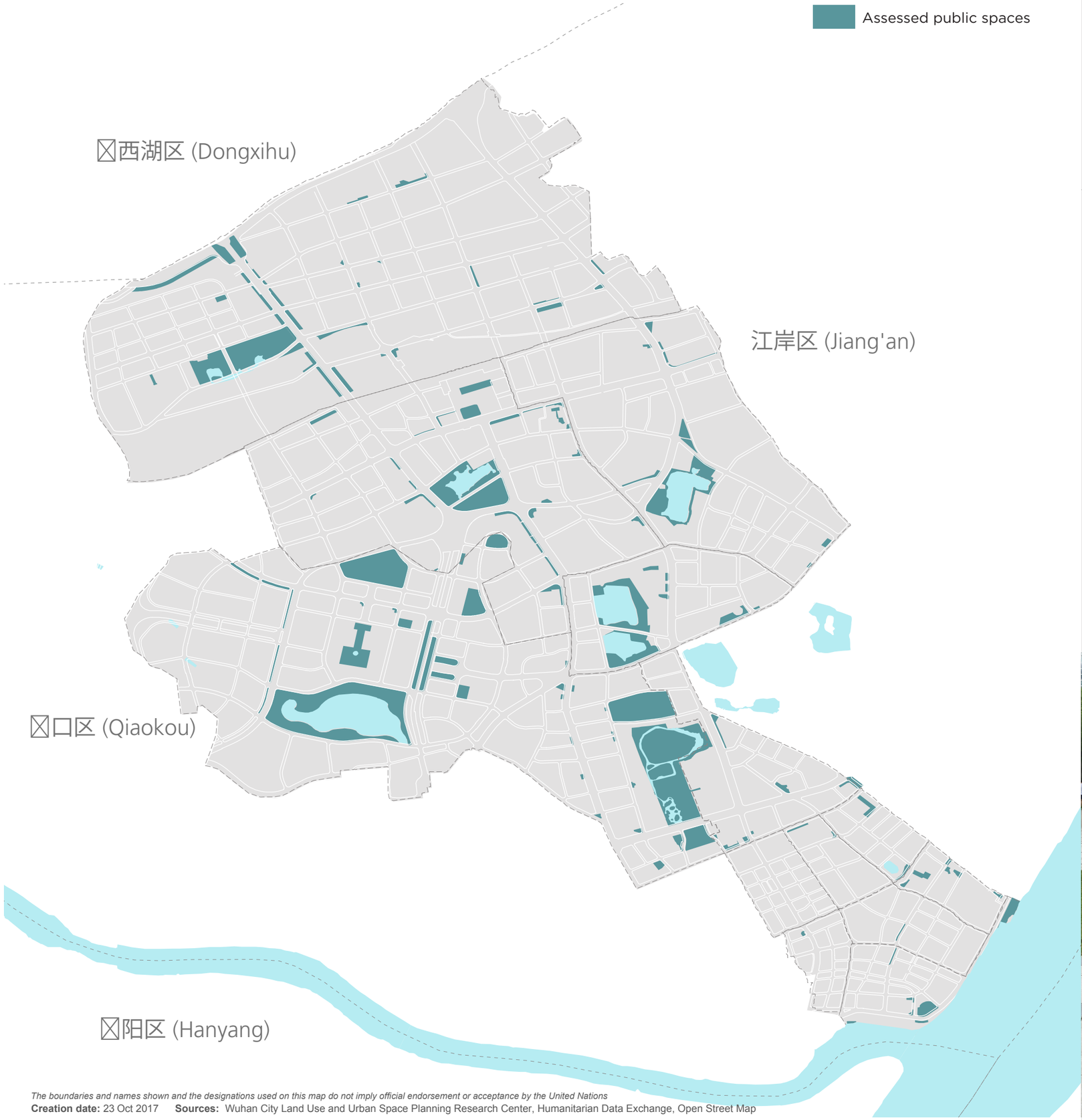
OPEN PUBLIC SPACES		
Typology	Area KM^2	Number
Parks	1.22	24
Community yards	0.15	15
Playgrounds	0.13	9
Plaza/Square	0.11	22
Water-body frontage	0.0035	2
TOTAL	**1.61**	**72**

STREETS		
Typology	**Area KM^2**	**Number**
Parking lot	0.09	13
Wide Sidewalk (over 5metres)	0.05	20
Transport Station	0.02	7
Road Reserve	0.00054	1
TOTAL	**0.16**	**41**

MARKETS		
Typology	Area KM^2	Number
Formal Market	0.003	1
TOTAL	**0.003**	**1**

PUBLIC FACILITIES		
Typology	Area KM^2	Number
City Hall	0.015	5
Public Library	0.0001	1
TOTAL	**0.015**	**6**

OTHERS		
Typology	Area KM^2	Number
Potential Public Space	0.13	17
Business Open Space	0.06	4
TOTAL	**0.19**	**21**



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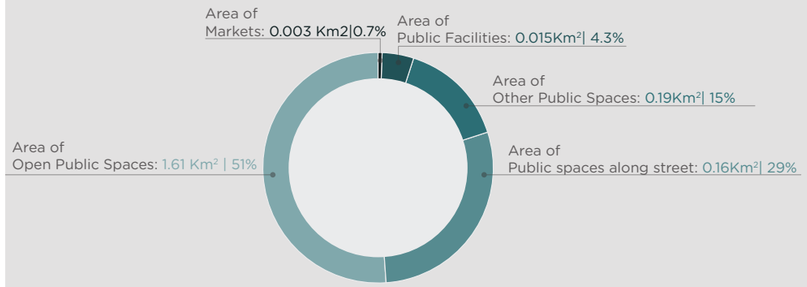
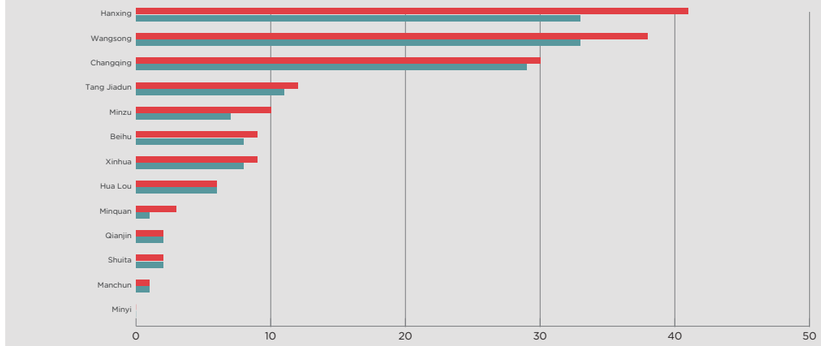
Creation date: 23 Oct 2017 **Sources:** Wuhan City Land Use and Urban Space Planning Research Center, Humanitarian Data Exchange, Open Street Map

PROPORTION OF EACH TYPE OF PUBLIC SPACE



DATA COLLECTED AND ASSESSED PER SUB-DISTRICT



- Streets as public spaces
- Open Public Spaces
- Green Public Spaces and Green Areas
- Typology of Public Spaces
- Public Facilities
- Ownership and Custodianship
- Accessibility and Connectivity
- Proximity Assessment
- Comfort Assessment
- Safety Assessment
- Use and User Assessment

“In the global environment, open spaces plays a pivotal role at the time of declining natural resources, increasing pollution, destruction of ozone layers, and fear of greenhouse effect. Without open space, the long-term sustainability of our cities is in some serious doubt”

Federal Department of Town Planning (2005:5), Malaysia

ANALYSIS

STREETS AS PUBLIC SPACES

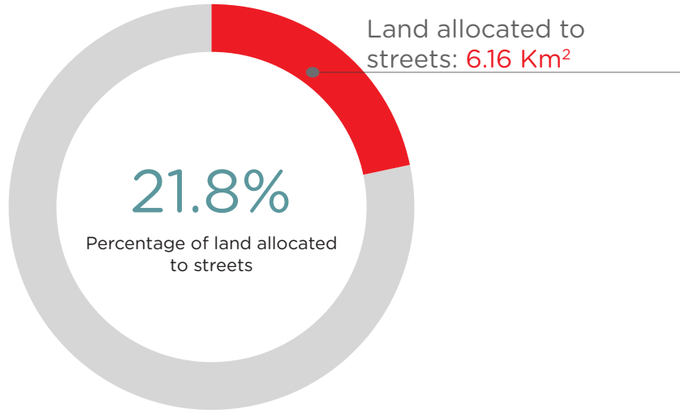
According to Donaly Appleyard (1981), streets are similar to meeting places where you can interact with strangers or an individual you know. It is a public space where town parades, public gatherings, and weekly markets are set-up for various interactions. In modern society, streets have merely become passes or paths and roads for vehicles having no emphasis on illuminating the social function. Streets can provides a greater harmony for social interaction. This builds a case that streets should not be reduced just to mobility functions (Project for Public Spaces). It is, therefore, very important to showcase streets in their entirety in which they elevate the uniqueness of the economic and social life of cities.

Rethinking on how to effectively maximize on public spaces, urban planners should focus on transit terminals, roads and parking lots and how they can serve both automobiles and mobility concerns. For instance, roads should be systemically shared with pedestrians and bike lanes as well as on-street parking. Also, with effective policies, parking lots can be converted into public markets during weekends when use of roads is minimal. Major urban road networks can be redesigned to provide dedicated bus lanes and bus stops that serves as gathering places for travelers.

The assessment found a total of 0.16 Km^2 of public spaces along the streets which accounts for 8% of all public spaces in Jianghan. These spaces include parking lots (0.09Km) , wide side walk (0.05Km^2), Transport station (0.02 Km^2) and road reserve (0.00054 Km^2). Wuhan is the seventh carbon emission trading center in China, following Beijing, Shanghai, Guangzhou, Shenzhen, Tianjin, and Chongqing in 2013. Jianghan can respond to these and mitigate CO_2 emissions by providing more green spaces and planting more trees along the streets.

With the rapid and ongoing developments, cities focus on relatively high density growth. In relation, street networks will get impacted by the form as well as rate of land use changes. Increase in multiple shopping activities and residential areas due to increase in population density in urban regions clearly showcase the demand for recreational activities. This showcase

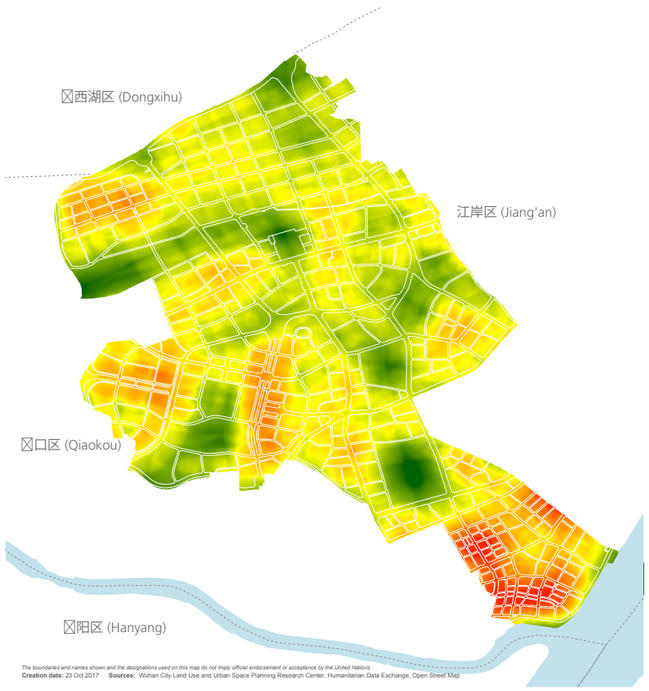
SCALE OF PUBLIC SPACE



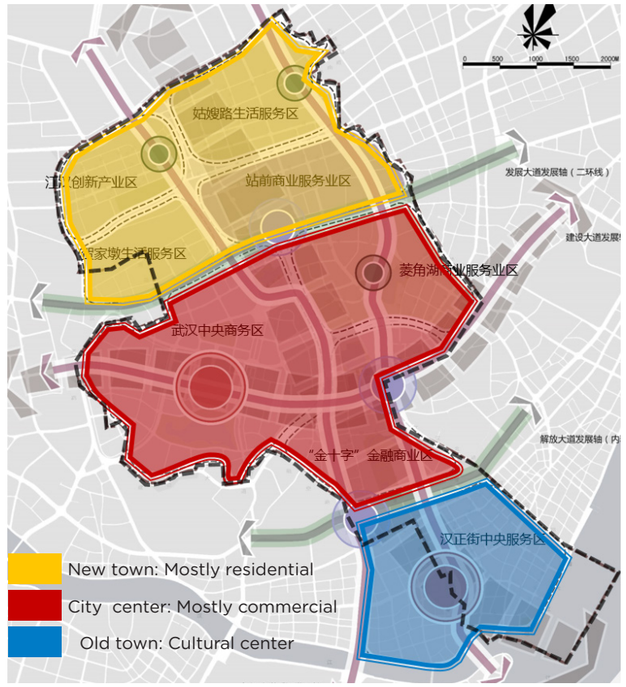
7.2Km (street length per Km^2)

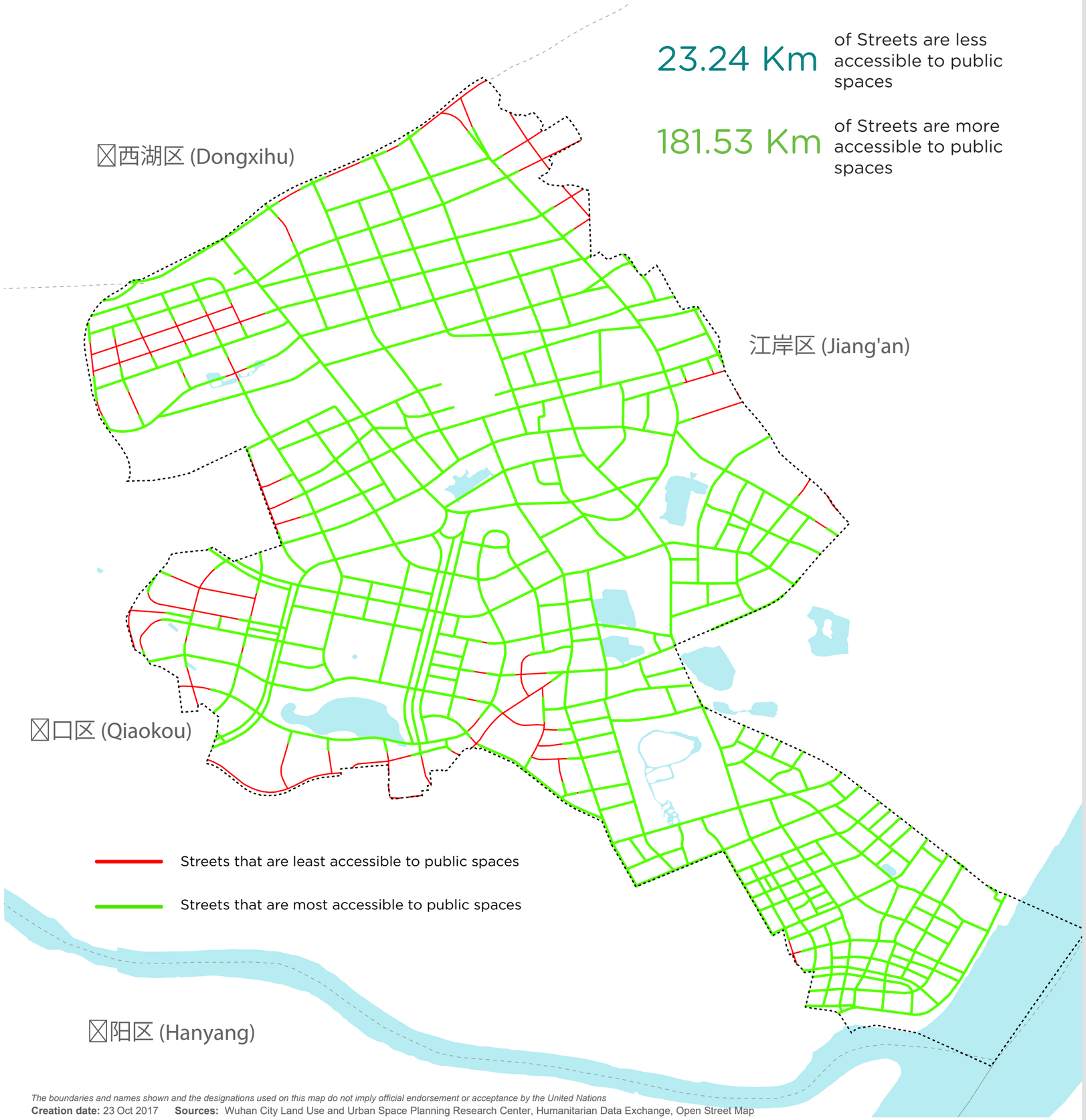
Jianghan falls behind the UN-Habitat's recommendation of 30%-35% of land allocated to streets as well as the 18Km per Km^2 of street length.

STREET CONNECTIVITY IN JIANGHAN DISTRICT



DIFFERENT SPATIAL CHARACTERISTICS OF JIANGHAN DISTRICT





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human desire to walk through city centers and meet with colleagues for recreational purposes. UN-Habitat also found a correlation between expansive street grids and prosperity and recommends a total of 35% of the land area to be dedicated to streets. Yet Jianghan has only 21.8%. Manhattan, has prioritized a reliable street pattern having the largest street grid in the world and a thriving economy with 36 percent of its area dedicated to streets.

Sidewalks should be well lit and wide. This attracts businesses such as outdoor cafes and public markets. Also, having benches every few meters is a good way to engage the community with resting places where they can get out and rest. Jianghan has a total of 181.53 Km of street length that is accessible to a public spaces within 10 mins walk. With wider pavements or sidewalks, it becomes safe for people wishing to jog in the morning with no worries of limited spaces and insecurity. Policies that mandate such investments in cities have been positively correlated with increasing physical activity by the public.

There is need to have many arterial streets to connect individuals to key locations in various parts of a city. Streets have to become a network that links the local assets together, thus making places accessible. In doing this, you create an economic and social environment where people have the opportunity to eat, shop, sit and relax, do recreational activities. The impact of street connectivity on accessibility to public spaces in Jianghan District was also assessed. The highest street density was registered in four sub districts namely: Minyi, Manchun, Minzu and Shuita registering between 21 – 28 street segments (lines) per square kilometer. This reflects the interconnectivity in these areas and apotential to encourage walkability and more efficient mobilit y. Local assets linked by the road tend to attract people as well as encourages them to spend time in that area. UN-Habitat recommends that for a city to be prosperous, 18Km of street length is recommended per square kilometer, yet Jianghan has only 7.2Km/Km^2.

Jianghan District can definitely utilize some of the best practices from all over the world when it comes to rethinking streets as places instead of a means of transportation. Connecting streets to local businesses will certainly increase consumers which in turn leads to proper investments in streets such as lighting and widened pavements as a matter of social benefit. This leads to a reduction in crime thus promoting safety.

OPEN PUBLIC SPACES

Public spaces in Jianghan District were categorized based on use, form and typology. From a broader perspective, they were classified as city/district level public spaces, neighbourhood/ sub-district level public spaces and pocket parks based on the size and recreational use of the public spaces. City/district level public spaces are larger and cater to the needs of a broader population, sub-district/neighbourhood public spaces provide for regular local use, and pocket parks are usually less than 400m^2 tend to act as scaled-down neighborhood public spaces

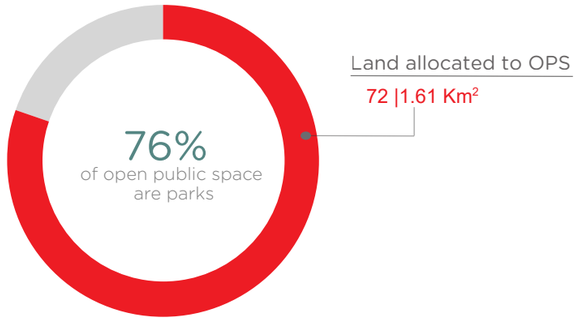
As many as 87 public spaces which accounted for 62% of all public spaces were sub-district/ neighbourhood level public spaces and pocket park accounted for 30% (42) while city level public spaces had the least representation in number of 12 (8%) but the largest in terms of area. It is however noteworthy that the smaller, neighborhood and pocket parks are usually more accessible and are often considered important spaces by the people.

These were then broken down into types of public spaces, namely, open public spaces, public facilities, markets and streets

Open public spaces refers to any green textures or hard surface that is accessible for use by the public at all times. The differentiation of these public spaces is based on the size, the function and use, surface texture and the availability of amenities within urban areas. Open public spaces occur in different typologies across the urban fabric such as parks, playgrounds, squares, gardens, riparian areas and sports fields among others. Plazas, squares, and parks are the most common types of public spaces. They are often located at a major crossroads (the intersection of two busy streets), at the end of a main street, or adjacent to a special natural feature like a beach or river

- Parks – usually occupies vast land sizes with natural vegetation coverage like trees or grassland. Parks have a demarcated entrance, paved pathways and have areas for different activities to cater for all park users. As with all public spaces, parks are in different scales in most urban areas.
- Playgrounds – these are spaces that are associated with playing activities of different scales with the main uses being children and the youth. Most playgrounds are found in neighborhoods.

PROPORTION OF LAND ALLOCATED TO OPEN PUBLIC SPACE TO ALL PUBLIC SPACES IN JIANGHAN DISTRICT



PER CAPITA OPEN PUBLIC SPACE

680,000
Population as of 2015

693,623
Population as of 2017

2.3m^2 / capita

550,000
Population by 2030

2.9m^2 / capita

OPEN PUBLIC SPACES		
Typology	Area KM^2	Number
Parks	1.22	24
Community yards	0.15	15
Playgrounds	0.13	9
Plaza/Square	0.11	22
Water-body frontage	0.0035	2
TOTAL	**1.61**	**72**

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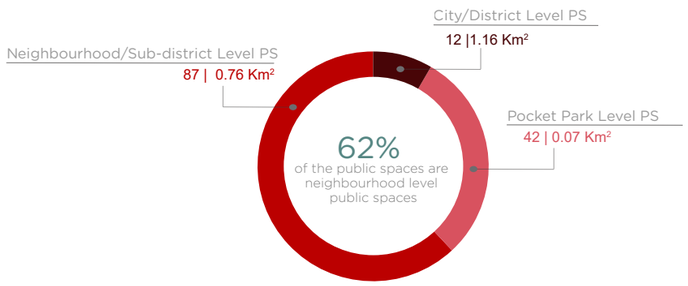
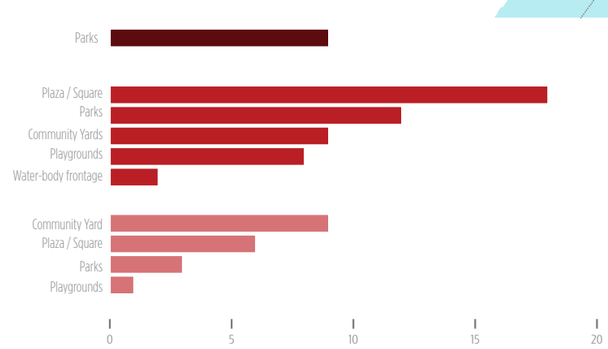
SCALE OF PUBLIC SPACE





- Riparian areas – riparian reserves along water bodies are important to filter out pollutants from the water bodies so as to promote biodiversity of the city. Riparian areas act as good public spaces as they are a scenic interface between terrestrial and aquatic ecosystems
- Gardens – gardens are small sized open public spaces mainly at the neighborhood level.
- Community squares/yards – most of these public spaces are shared between communities in the neighborhood level.
- Plaza and squares – these are hard-surfaces public open spaces mainly associated with streets. They are mainly bordered by buildings and paved walkways. In most cases, plazas will have a monument, potted plants, sitting areas and shops.

Open public spaces that were categorized at city level were all parks, and neighbourhood level public spaces were mainly Plazas/squares while pocket parks were maily community yards. The proportion of land allocated to open public spaces in Jianghan District was 1.61 Km^2 which is 51% of all public spaces in Jianghan but only 5.7% of the land share of Jianghan. The per capita open public space using 2017 population projection is 2.3 m^2 and this is projected to increase to 2.9 m^2 by 2030 due to the expected population decline.

Majority of the open public spaces which were 72 in number constituted mainly of parks having an area of 1.22 Km^2 amounting to 24 in number, community yards were 15 in number with a total area of 0.15 Km^2, playgrounds were 0.13 Km^2, plaza or squares were 0.11 Km^2 and waterbodies frontage were 0.0035 Km^2.

Jianghan should design their open public space network as an integral part of the urban structure and offer a variety of safe and attractive spaces that are well distributed throughout the district and that are accessible, connected and cater to the sporting and recreation needs of the community.

GREEN PUBLIC SPACES

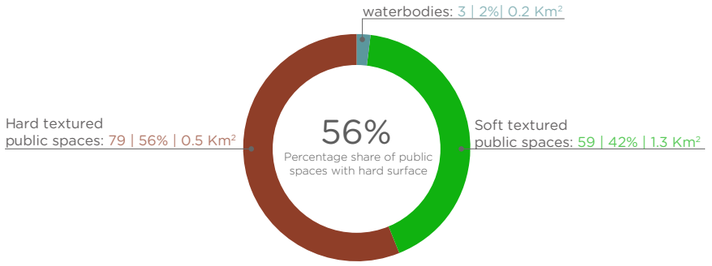
There is a recent revival of interest in the importance of green space to support healthy living in urban areas. Links between green space and health have been recognized throughout history, and were one of the driving forces behind the urban parks movement of the 19th century in Europe and North America (Schuyler, 1988). In urban areas preventable noncommunicable diseases, such as mental illness, obesity, cardiovascular diseases, type 2 diabetes and cancer, remain major factors not only affecting health and well-being,but also driving up the cost of health care and reducing the productivity of the workforce. Many such illnesses are linked to chronic stress and lifestyle factors, such as insufficient physical activity (Shortt et al., 2014). Research has proven multiple benefits that the amount of urban green spaces can contribute to addressing major public health issues related to noncommunicable diseases.

Climate change is recognized as a serious issue. The share of land dedicated to green areas has also been linked to climate change mitigation. Wuhan is the major city that has been given the responsibility of fighting floods from the middle and lower reaches of the Yangtze River. Jianghan District, which is at a confluence of two major rivers faces a major responsibility of fighting this natural phenomenon. Public spaces can be design to mitigate flood impact such as using parks as water retention areas during rainy seasons, as well as using terracing. The permeability of public spaces can also capture excess water and infiltrate it to the ground.

Green public spaces have also been linked to reduction of urban heat island effect. Urban greening is a cost effective way of moderating harsh climates at a local level. Trees and vegetation have a natural cooling effect as they provide shade, potentially reducing surface temperature, by 5°C, to 20°C. In addition, evapo-transpiration from vegetation consumes a significant proportion of the available heat energy in the atmosphere.

The total green area for Jianghan is 2 Km^2. This study shows that Jianghan District falls short of standards set by the National Ecological city of 11m^2/capita green area as well as the international minimum standard of 5m^2/capita green area. Total green public space is just 2.2m^2 per capita. By 2030, the per capita green area will be 3.6m^2. However, the presence of trees, soft texture and grass coverage is significant in Jianghan's public spaces.

TEXTURE OF PUBLIC SPACES



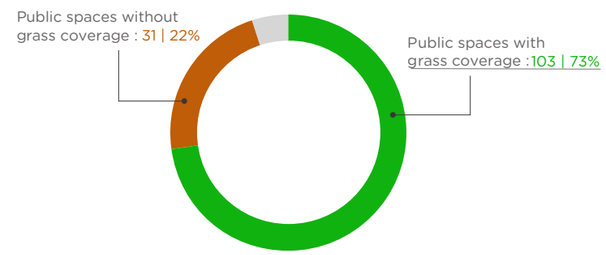
PER CAPITA GREEN PUBLIC SPACE

680,000
Population as of 2015

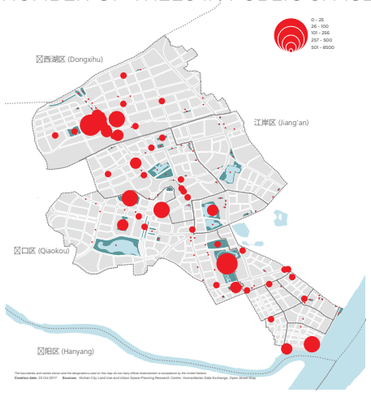
693,623
Population as of 2017
2.2m² / capita

550,000
Population by 2030
3.6m² / capita

PUBLIC SPACES WITH GRASS COVERAGE

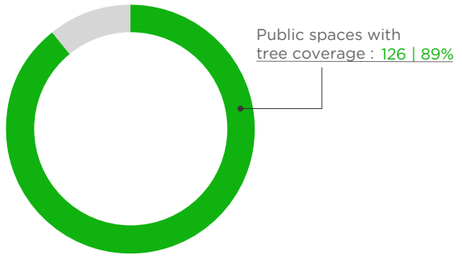


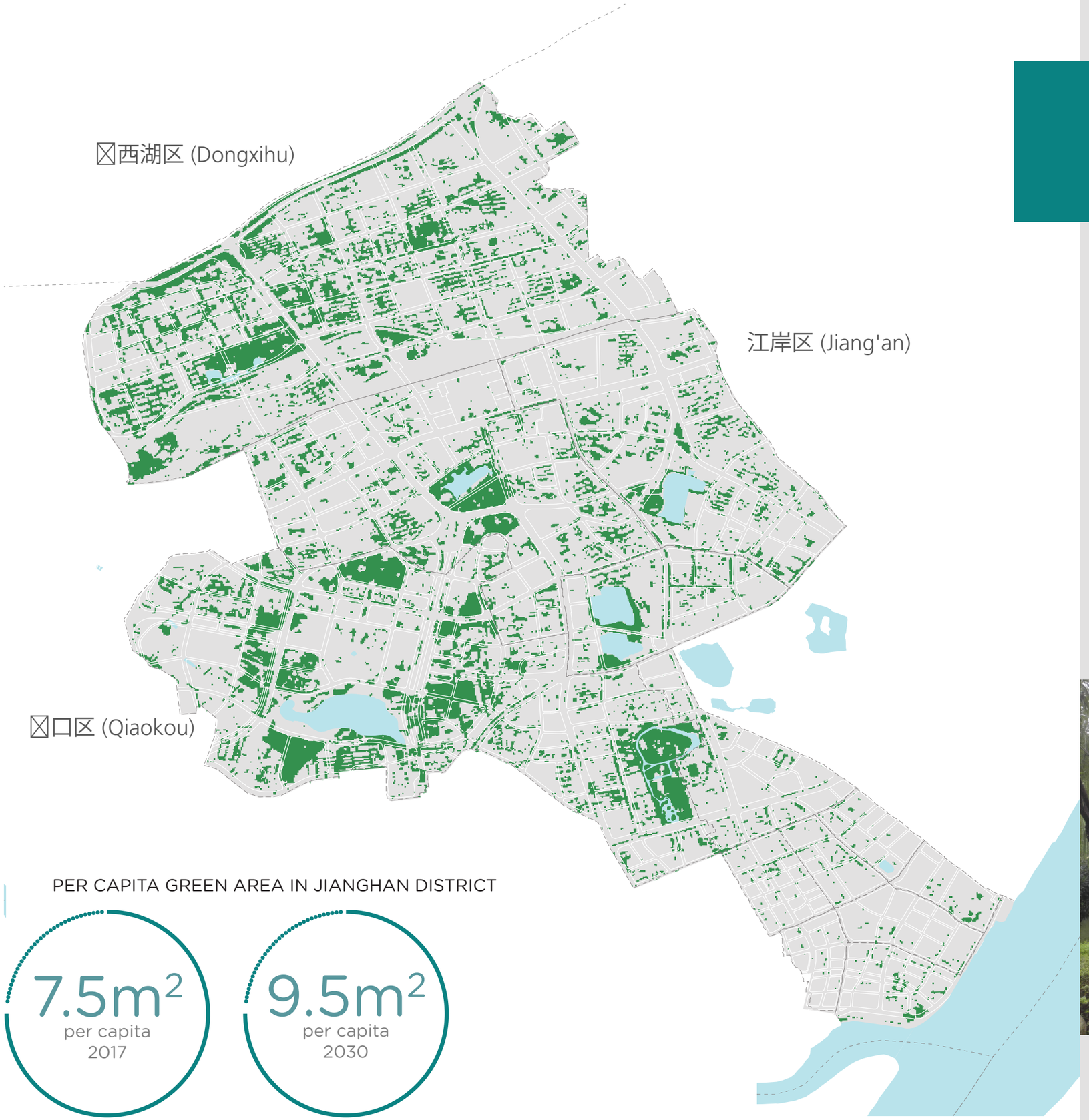
NUMBER OF TREES IN PUBLIC SPACES



GREEN PUBLIC SPACE INDEX

PUBLIC SPACES WITH TREE COVERAGE





PER CAPITA GREEN AREA IN JIANGHAN DISTRICT

7.5m²
per capita
2017

9.5m²
per capita
2030

GREEN AREAS

The importance of urban green areas and connecting fragments of green space with ecological corridors to improve biodiversity cannot be overlooked. If adequately designed, green corridors can improve urban ventilation, allowing for cooler air from outside to penetrate into the more densely built areas, and reducing thus the urban heat island effect. Among the most dangerous pollutants is $PM_{2.5}$, which can directly pass through human lungs and move into the blood system. The use of nature-based solutions, such as increased vegetation cover in an urban landscape, is one of the possible solutions for reducing $PM_{2.5}$ concentration. Studies conducted by UN-Habitat has shown that Jianghan District has an annual average $PM_{2.5}$ of 52.5 ug/m^3 which is 5 times greater than the recommended annual average of 10 ug/m^3 by W.H.O.

Area of green spaces in Jiangahn District including trees, private gardens, public green areas, natural areas, strips along streets etc were calculated using satellite imagery and found to be 5.2 Km^2 which accouts for 18% of the total area of Jianghan District. This area shows a green per capita of 7.5m^2 which is below the recommended 9 m^2 per capita green area by W.H.O. Due to the expected population decline, the per capita green are increases to 9.5^2 when the population is projected to 550,000 in 2030.

TYPOLOGY OF PUBLIC SPACES

Public space typology must be considered within the morphology of the city. A space or street by itself as a public space is meaningless. Public spaces must be conceptualized and designed in its physical and spatial context. This helps in understanding the relationship between the physical form of the public space, the function it provides and the relationship to other built form elements.

The survey conducted in Jianghan revealed a total of 141 public spaces. Out of these, majority were parks, which amount to 24 (17%), plazas /squares were 22, wide side walks were 20, potential public areas were 17, community yards were 15, parking lots were 13, playgrounds were 9, transport stations were 7, public facilities were 6, business open spaces were 4, water body frontage were 2, road reserves was 1 and one market.

All the above public spaces combined cover an area of 2km^{2,} which is about 8% of the total area of Jianghan. UN - Habitat recommends a 15% to 20% of land to be dedicated to public spaces while 30%-35% should be left for streets. Jianghan's area of public spaces falls below this recommendation and might need to consider creating new public space to counter its growing population.

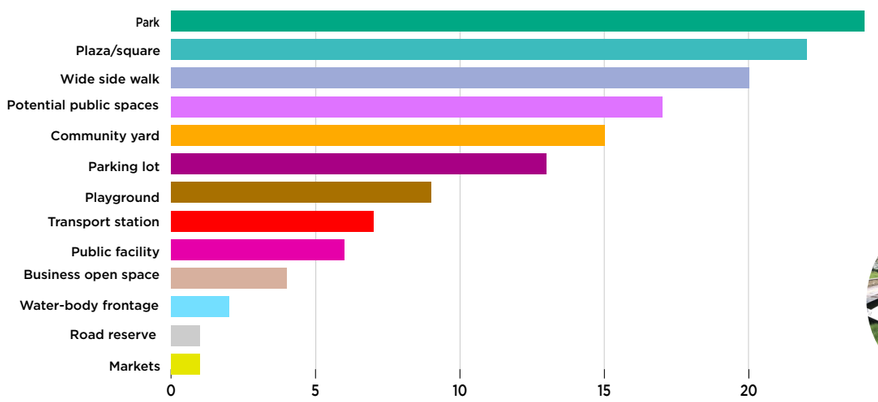
The assessment shows a presence of various landmarks and monuments in the city. Monuments gives cities their identity and character to a public space and a city as a whole. Land marks have become symbolic in informing on history culture and heritage of a community.

The assessment reveals that various landmarks are present in 64 (45%) public spaces. Out of these, 19% (27) are monuments, 28% are seating furniture, 4% (5) are play furniture, 5% (7) are artificial shading and 11% (15) are artificial water bodies. The remaining 77 (55%) of public spaces do not have any special landmarks or monuments on them.

Water frontages are another important aspect that defines the character of a public space. They bring forth a serene environment for relaxation and more importantly they contribute to maintaining biodiversity. Jianghan has 2 natural water body frontages which cover an area of 0.0035Km^2. Such natural resources should be guarded and maintained to preserve this natural heritage.

TYPOLOGY OF PUBLIC SPACES

PROPORTION OF DIFFERENT TYPOLOGIES OF PUBLIC SPACES



LANDMARKS PRESENT IN PUBLIC SPACES

Seating furniture 40, 28%

Monuments 27, 19%

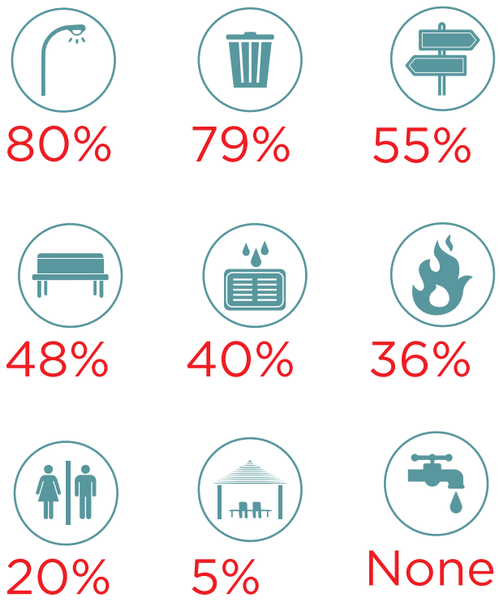
Artificial water bodies 15, 11%

Artificial shade 7, 5%

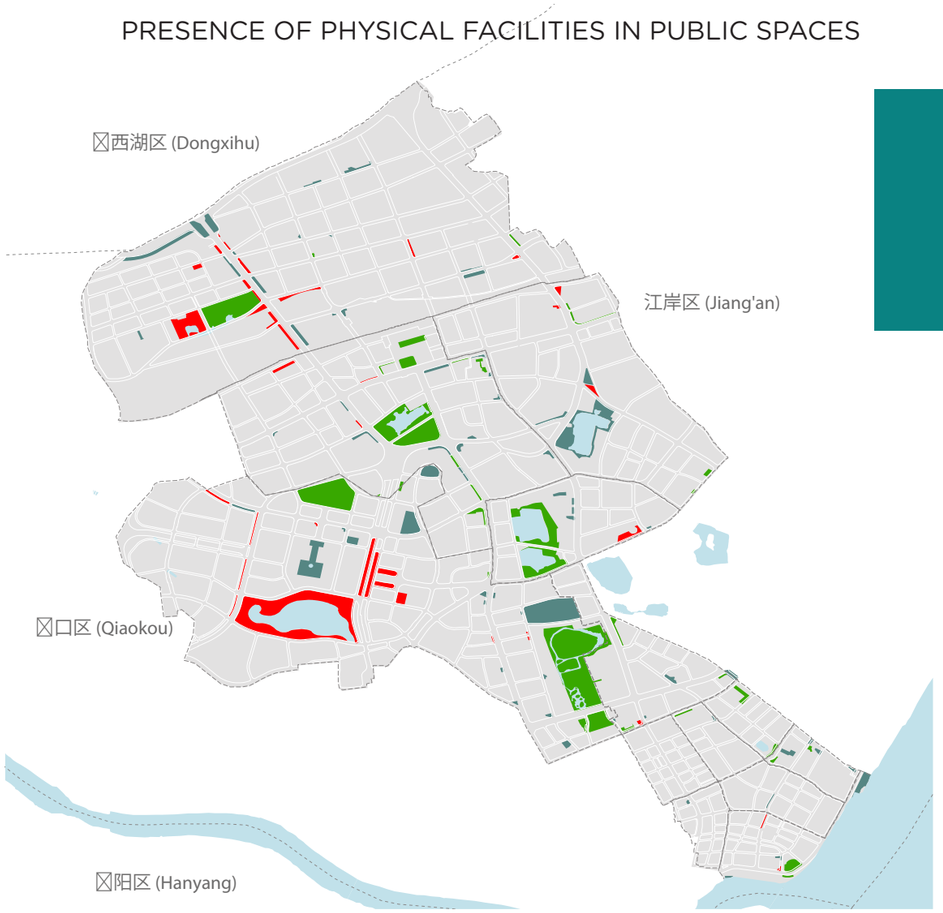
Play furniture 5, 4%

PHYSICAL FACILITIES

AMENITIES PRESENT IN PUBLIC SPACES



PRESENCE OF PHYSICAL FACILITIES IN PUBLIC SPACES



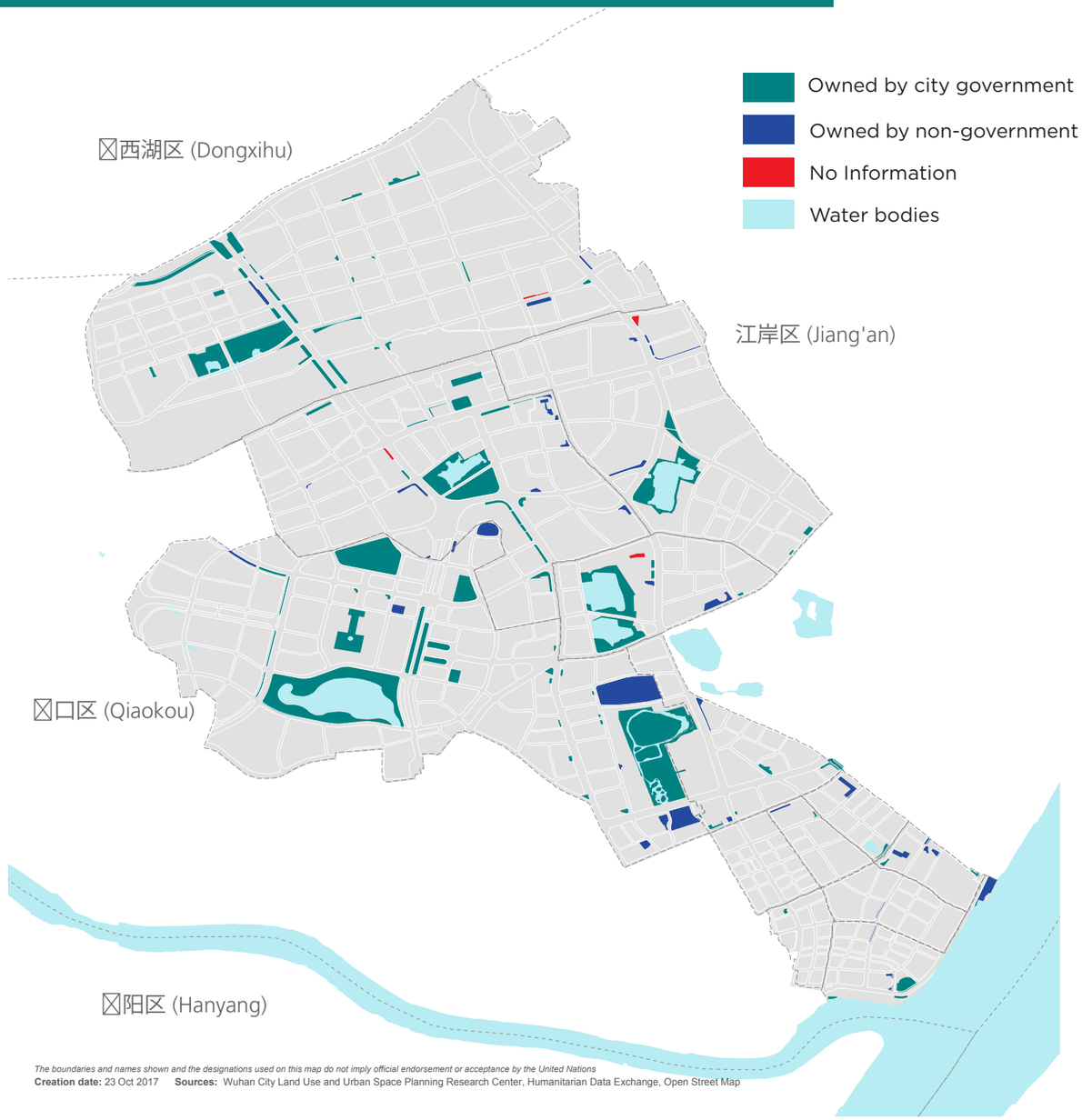
OPEN PUBLIC SPACES			
Typology	Total No.	Good condition	Majority Present
Street lighting	113	60	Plaza/Square (21)
Garbage bin	111	44	Parks (22)
Signage	77	35	Parks (17)
Seating facility	68	26	Parks (19)
Drainage	56	25	Plaza/ Square (13)
Fire emergency	51	16	Plaza/ Square (13)
Public Toilet	28	15	Parks (14)
Artificial Shade	7	1	Parks (3)
Water Tap	0	0	n/a

The presence of well-designed and maintained places coupled with adequate infrastructure supporting safety and comfort in public spaces such as signage and lighting, as well as seating, shade and shelter, encourages people to use facilities, thereby supporting activity and social interaction. These features contribute to building social capital as well as the physical and mental health of the community. In a study involving older women, Chastin et al. (2014) found that the lack of resting places outside the home strongly limited participants' motivation or confidence to be active. Most said they would walk more if they could find resting places at staggered intervals in public spaces, enabling them to rest when needed and giving them increased confidence to venture further outside. This confirms other research that has identified the value of trees and greenery as attractors for older people to use the outdoor environment, but also the importance of seating and facilities such as toilets to enable older people's access to and enjoyment of public green space (Aspinall et al., 2010).

In Jianghan, a physical facilities index was calculated to determine public spaces with the least number of amenities and their condition. An aggregate of presence, condition and sufficiency of seating facilities, street lighting, garbage bin, public toilet, signage, fountain or tap, drainage ditch, artificial shade, vehicular parking, bicycle parking, fire emergency, convenient stores, health facilities and baby care facilities. A total of 37 public spaces out of the total of 141 had majority of these amenities present and were in good condition while 37 either did not have the amenities or were in poor condition. 67 public spaces had either a moderate proportion of these amenities present and were in

113 public spaces out of the total 141 had mainly street lighting but only 53% were in good condition. Artificial shade, public toilet were rarely present in public space while the ones with these amenities were not in good condition. None of the public spaces in Jianghan had water tap/fountain for drinking water. Amenities were mostly found in parks and plazas/square. This shows a gap in the provision of amenities in public spaces in Jianghan District hence affects the functionality of these spaces.

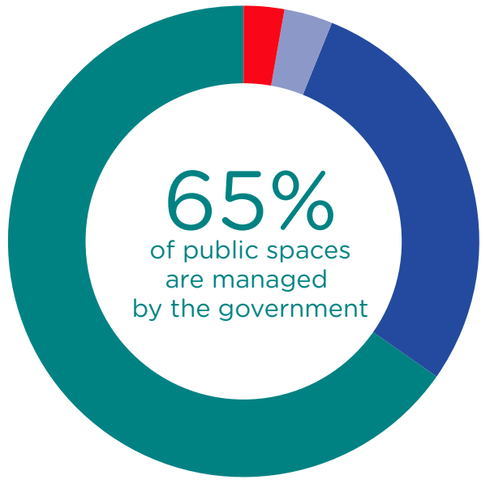
OWNERSHIP AND MANAGEMENT

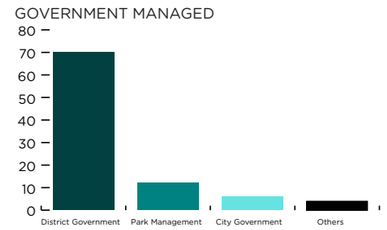


The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

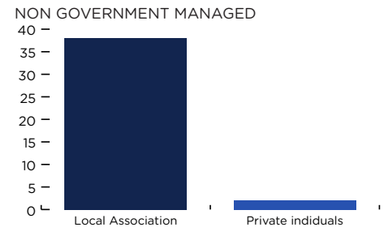
Creation date: 23 Oct 2017 **Sources:** Wuhan City Land Use and Urban Space Planning Research Center, Humanitarian Data Exchange, Open Street Map

MANAGEMENT OF PUBLIC SPACES



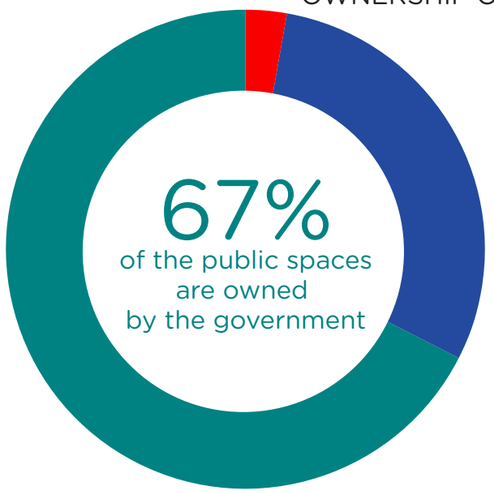


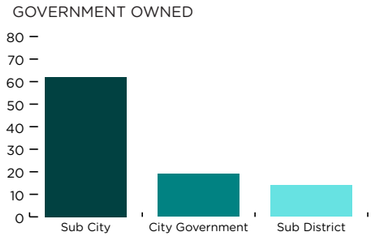
65%
(Public spaces owned and managed by government)

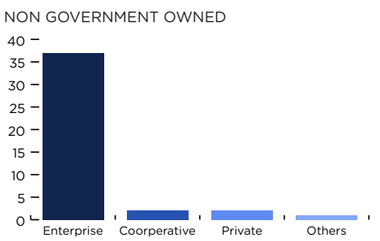


28%
(Public spaces owned and managed by non-government)

OWNERSHIP OF PUBLIC SPACES



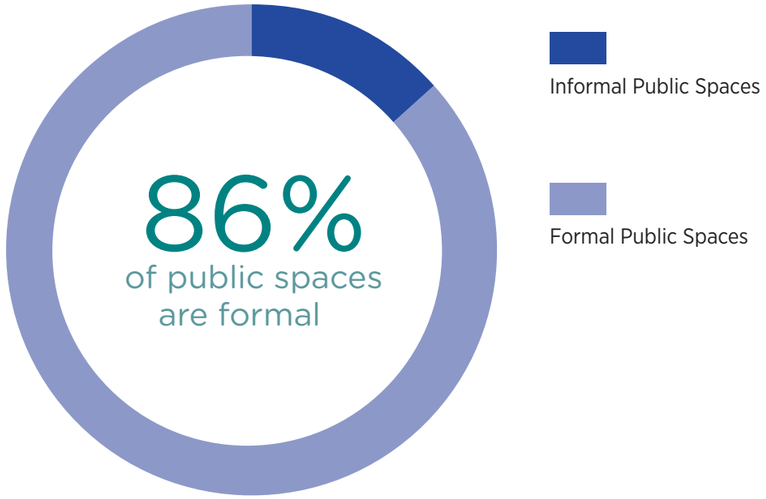




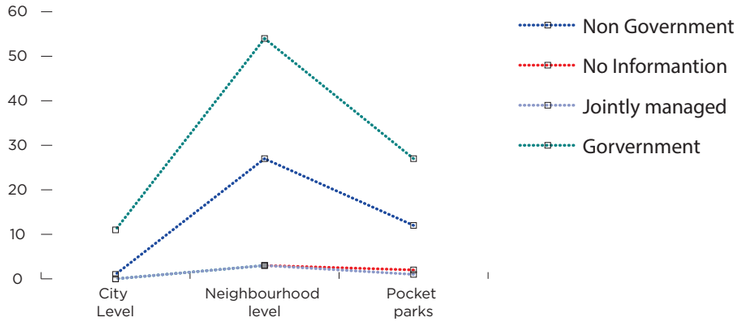
55%
(Public spaces are formal, owned and managed by government)

Government
Non - Government
No Information
Jointly Managed

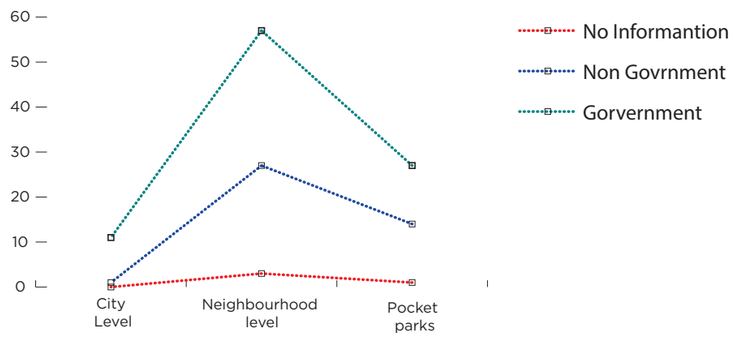
GRAPH OF MANAGEMENT OF PUBLIC SPACES AT DIFFERENT LEVELS

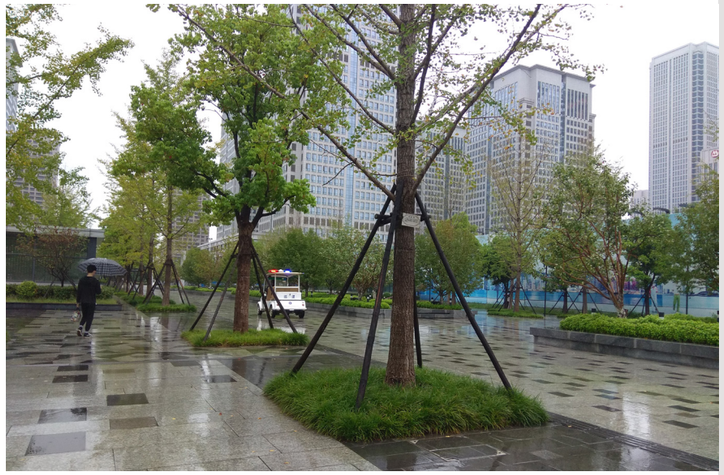


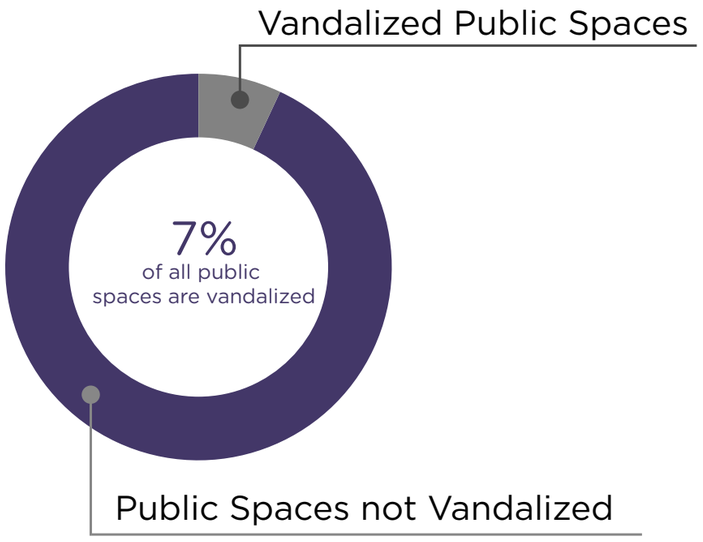
MANAGEMENT OF PUBLIC SPACES AT DIFFERENT SCALES



OWNERSHIP OF PUBLIC SPACES AT DIFFERENT SCALES







Great public spaces are places where people always want to return. Central to this is a progressive management plan that promotes ways of maintaining and enhancing a clean, safe and lively place. Good management understands the needs and desires of existing and potential users of the open public space and strives to ameliorate their experiences. Moreover, the management acts swiftly to empty waste bins, maintain and fix infrastructure and amenities thereby giving people a feeling of comfort and safety in the space.

The city wide assessment of Jianghan shows that majority (65%) of public spaces are owned and managed by the government. Out of these, majority are owned by the sub city branch of the government while majority is managed by the district government. 28% of public spaces are owned and managed by non government with major ownership being entreprices and managed by local associations. Formal public spaces amount to 86% of all public spaces. Majority of neighborhood level public spaces are owned (57)and managed (54) by the government while only 3 are managed jointly.

A small number of public spaces (10) were recorded as vandalized this included, broken seats and street laps, illegal advertising, damaged cycle lanes etc. A surprising percentage 60% (6 out of 10) of the vandalized public spaces are owned and managed by the government.

ACCESSIBILITY AND CONNECTIVITY

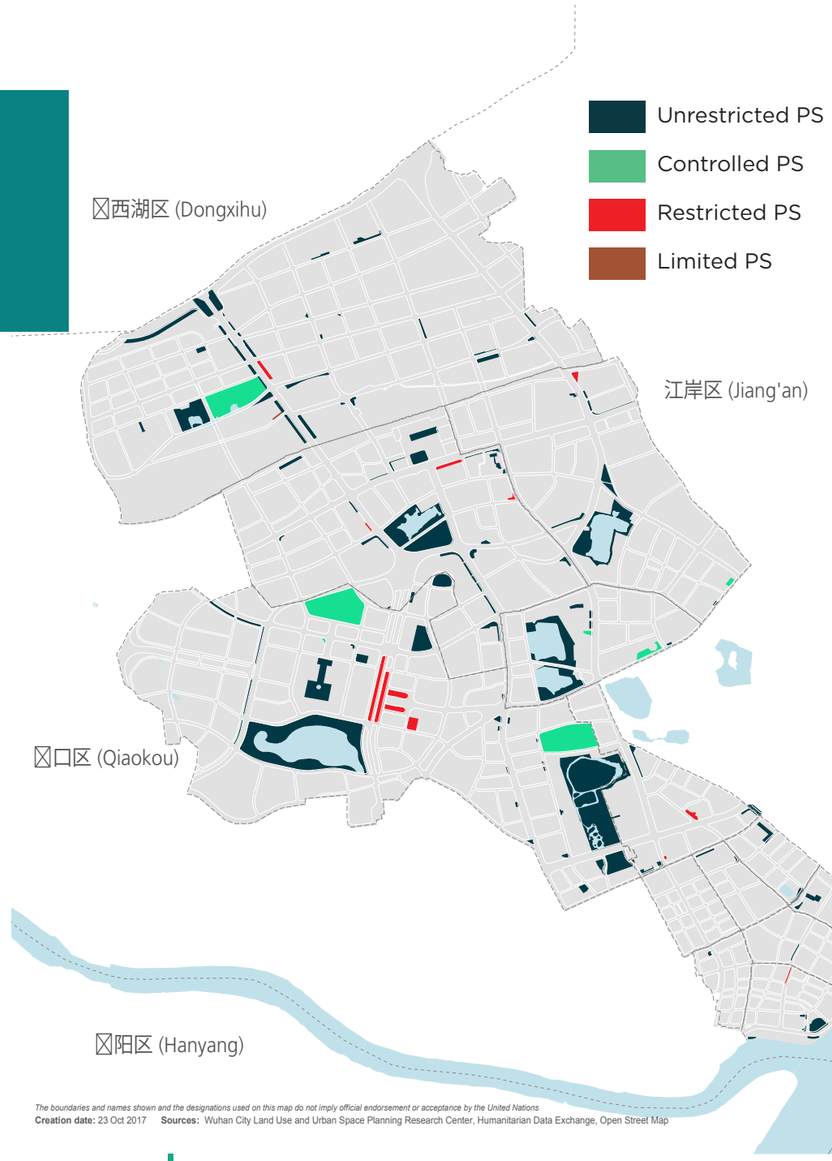
Access is basically the ability of an individual to gain access to a facility or service. Accessibility is dependent on socio-economic status, race, gender, age and physical ability. Connectivity is the articulation of networks that connect different public spaces irrespective of their typology and location. Connectivity is important to ensure that public spaces are not left as an island and therefore lose its functionality. Increased connectivity allows users to use as many diverse open public spaces as possible. A high quality public space can be of limited value if access to it is restricted by major barriers such as transportation corridors. An integrated public network is efficient and effective in increasing the use of public spaces and hence the sustainability of the open spaces.

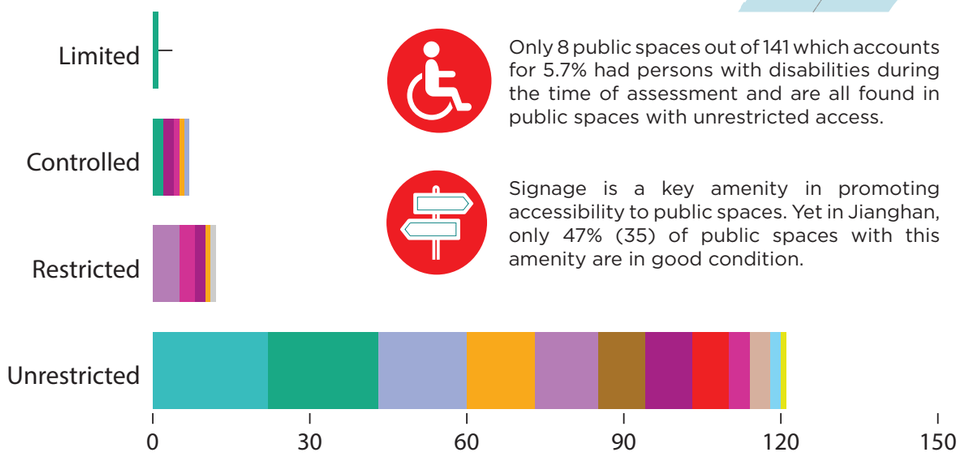
Access into public spaces is described in two ways:

- Physical access – this describes the physical opportunity created to use the physical space. Issues like paved sidewalks, pedestrian walkways, public transport etc. are important elements which promote mobility and foster social interaction in the public open spaces. For easy access to open spaces, there has to be adequate infrastructure for all people to get to the open spaces and especially for the physically challenged. Physical access is also determined by the distribution of open spaces across urban centres, the more the open spaces, the easier it is to access them.
- Inclusivity – this describes the ability to allow everyone to use public spaces. Once entry fees are charged to use the public open spaces, they lock out the economically disadvantaged people from enjoying such facilities which cause segregation in the urban areas.

There are four categories used to assess the inclusivity of public spaces based on accessibility in Jianghan District

- The first is **unrestricted access** to public spaces which means the space do not charge the users to enter and use the space. Users are also not restricted to the time they can spend in the public spaces. The assessments shows that majority of public spaces in Jianghan are unrestricted with the majority of these unrestricted spaces being plazas (22) and parks (21) During the time of assessment, there was a good representation of different users, however, male adults (age 25 - 60) appeared to be dominant or in majority of the assessed public spaces, they were present in 86 unrestricted access public spaces.

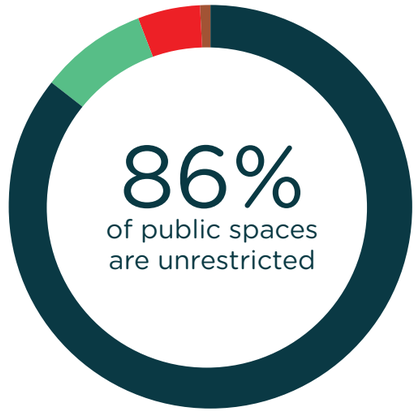




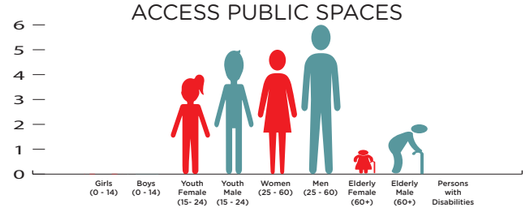
Only 8 public spaces out of 141 which accounts for 5.7% had persons with disabilities during the time of assessment and are all found in public spaces with unrestricted access.

Signage is a key amenity in promoting accessibility to public spaces. Yet in Jianghan, only 47% (35) of public spaces with this amenity are in good condition.

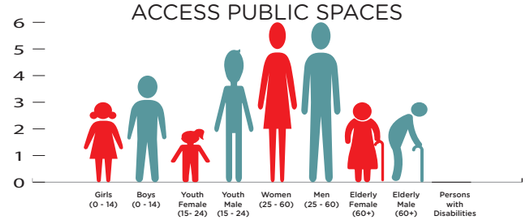
ACCESSIBILITY LEVEL OF PUBLIC SPACES



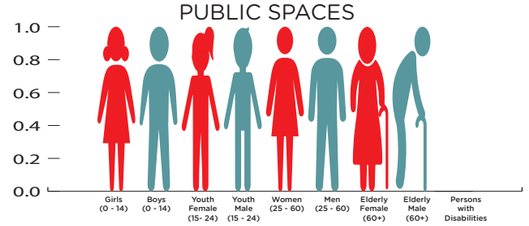
PROPORTION OF USERS IN RESTRICTED ACCESS PUBLIC SPACES



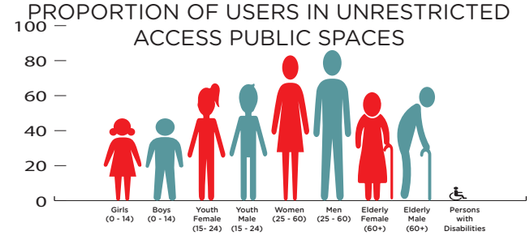
PROPORTION OF USERS IN CONTROLLED ACCESS PUBLIC SPACES



PROPORTION OF USERS IN LIMITED ACCESS PUBLIC SPACES



PROPORTION OF USERS IN UNRESTRICTED ACCESS PUBLIC SPACES



19% (Public spaces that are most accessible)

An accessibility index of public spaces in Jianghan revealed that only 19% (27) are most accessible.

89% (Public spaces with clear entrance)

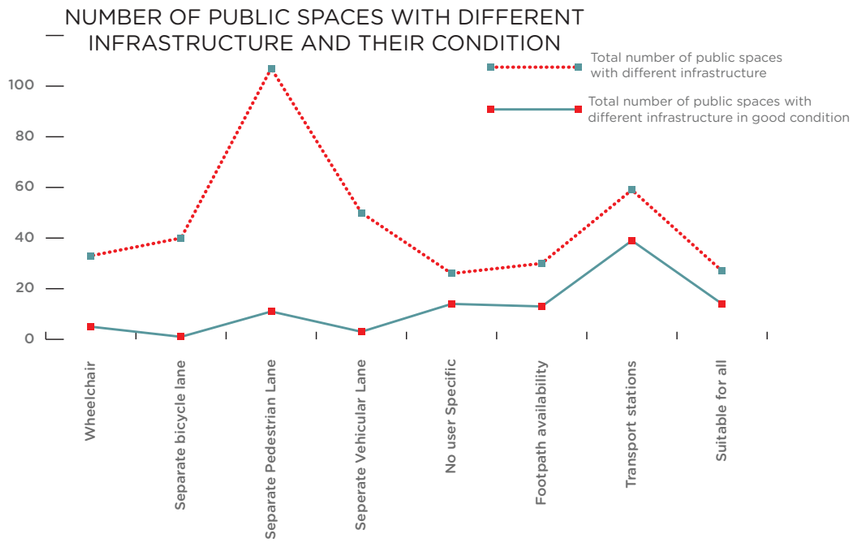
The assessment showed a significant number of public spaces (89%) have clear and defined entrances.

41% (Public spaces with bicycle parking)

41% (58) of all public spaces in Jianghan have bicycle parking and only 17 of these are in good condition.

36% (Public spaces with vehicular parking)

Out of all public spaces in Jianghan, 36% (51) have vehicular parking and only 21 are in good condition



- The second category is public spaces with **controlled access** where charges are not imposed on the users but the public open spaces are used at only certain times of the day. Public spaces with this level of access amounted to a total of 7 with majority of them being parks (2) and parking lots (2). At the time of assessment, dominant users present in the controlled access spaces were adult male and female (age 25 - 60) who were present in 6 of the public spaces..
- The third category is public spaces with **limited access** where users are required to pay an entrance fee. Public space with this level of access was only one park and the users present during the time of access were equally represented in terms of age and gender. However, persons with disabilities were not present.
- The last category is the **restricted access** where the public space is restricted to specific users. Public spaces with restricted access were 12 with majority being potential public spaces (5). The dominant users present in the restricted public spaces were male adults who were present in 6 out of 12 of the public spaces.

The physical accessibility of public spaces in Jianghan was also determined using the infrastructure available to access the public spaces, their condition and the presence of clearly defined entrances.

Research has shown that 1 Km is generally acceptable distance for most people to walk to city's facilities, but if the route is interesting, inviting and of good quality, many people happily walk longer . (Jan Ghel). The map on the left shows how far one can potentially reach 2.5 Km of walk and 5 Km of cycling.

Only 8 public spaces with restricted access had persons with disabilities present during assessment period. This may be due to the low number of public spaces with wheelchair access infrastructure that are in good condition. 107 public spaces had separate pedestrian lanes but only 11 were in good condition. 13 out of 30 public spaces had footpaths that were in good condition. 50 public spaces had separate vehicular lanes but only 3 were in good condition. 59 public spaces had transport stations present but only 39 were in good condition.

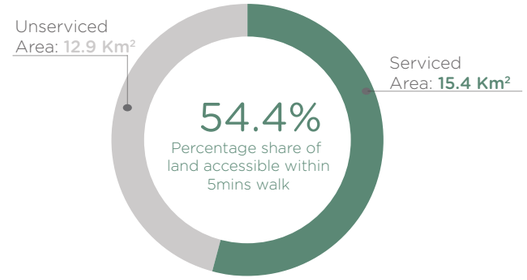
PROXIMITY ASSESSMENT

Urban parks and gardens play a critical role in cooling cities, providing safe routes for walking and cycling as well as sites for physical activity, social interaction and for recreation. A key indicator of accessibility is proximity to public space from a residence or neighbourhood to the nearest public space. Recent estimates show that physical inactivity, linked to poor walkability and lack of access to recreational areas, accounts for 3.3% of global deaths. Walk distance is important because walking is the primary access mode from home to public spaces and because walking distance has a significant impact on public space use. It has been noted that accessibility and utilization of public spaces have decreased since they are neglected in urban planning and development processes.

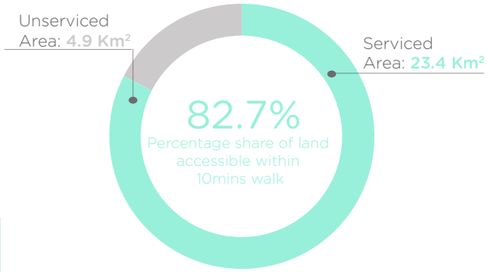
A study in the United Kingdom used wearable electroencephalography (EEG) devices to demonstrate the effects of a short walk in a green space on brain activity that might be associated with enhanced relaxation and restoration (Aspinall et al., 2015). It was also shown that walking in natural environments produces stronger short-term cognitive benefits than walking in the residential urban environment (Gidlow et al., 2016a).

The maps on the right focuses on spatial access as understanding influences on walking distance to public spaces along the streets as a key element of establishing equitable access to public spaces.

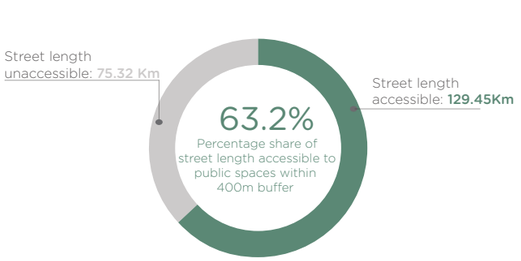
AREA COVERED BY 400m (5 mins walk) BUFFER



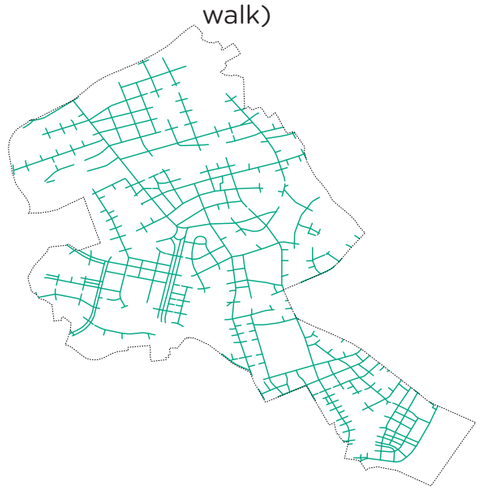
AREA COVERED BY 1,000m (10 mins walk) BUFFER



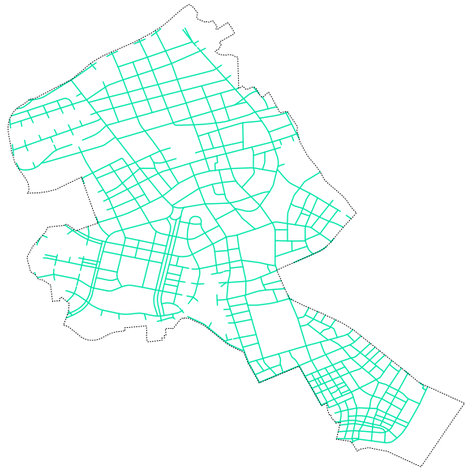
LENGTH OF STREET ACCESSIBLE TO PUBLIC SPACES WITHIN 400M



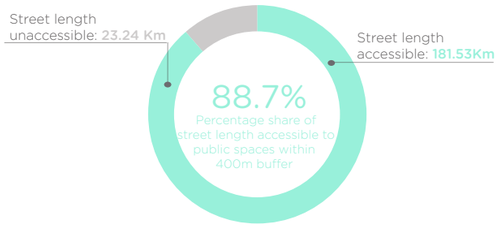
STREETS ACCESSIBLE TO PUBLIC SPACES WITHIN 400M BUFFER (5mins walk)



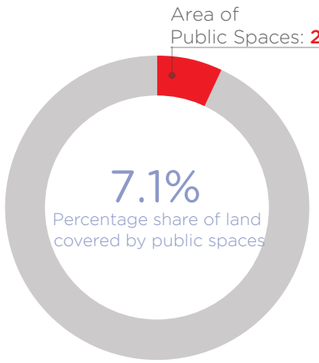
STREETS ACCESSIBLE TO PUBLIC SPACES WITHIN 1,000M BUFFER (10mins walk)



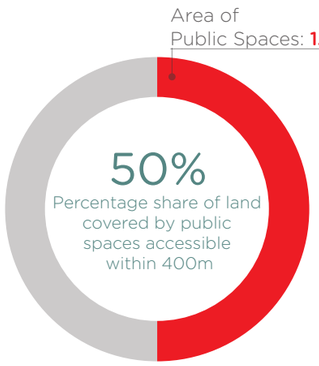
LENGTH OF STREET ACCESSIBLE TO PUBLIC SPACES WITHIN 1,000M

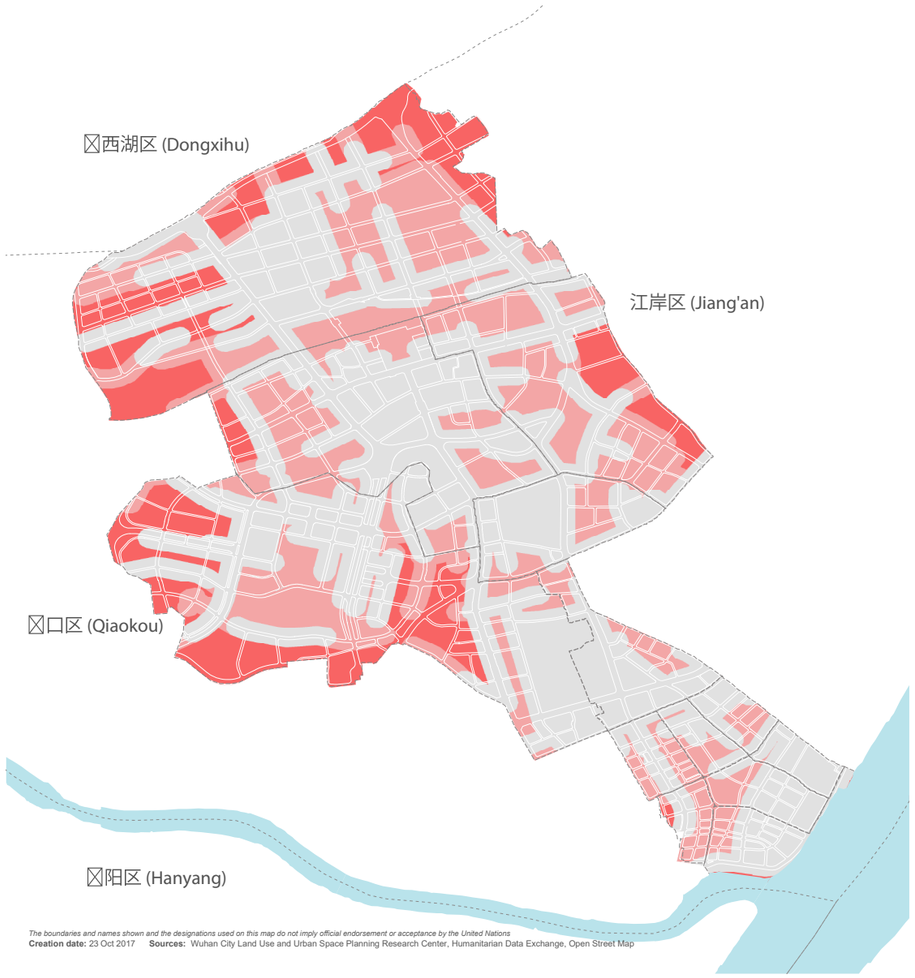


AREA PUBLIC SPACES IN JIANGHAN DISTRICT

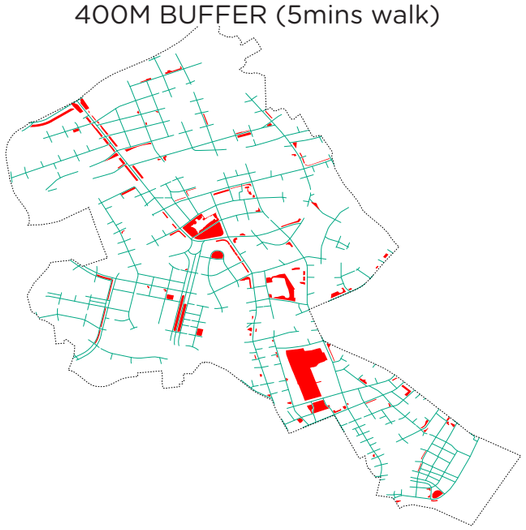


AREA PUBLIC SPACES ACCESSIBLE WITHIN 400M BUFFER (5mins walk)

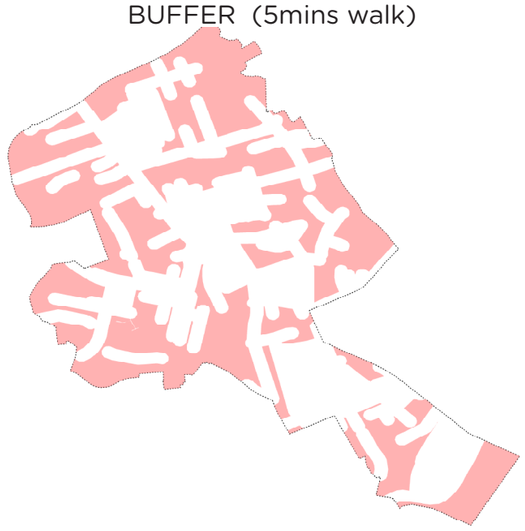




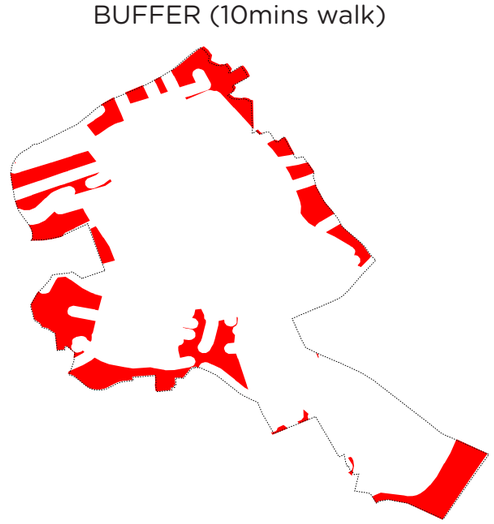
PUBLIC SPACES ACCESSIBLE WITHIN 400M BUFFER (5mins walk)



AREA UNSERVICED WITHIN 400M BUFFER (5mins walk)



AREA UNSERVICED WITHIN 00M BUFFER (10mins walk)



Lessons from across the world show that spaces that are within a 5-to 10 minute walk from home tend to be more active. As such, 1,000m or 10mins walking distance has been widely accepted and promoted as a 'reasonable distance' for people to walk, and as such, ideal for the distribution of neighbourhood public spaces. The assessment, with the assumption that all streets are walkable with no barriers such as rivers and highways, found that 54.4% (15.4 Km^2) of the area of Jianghan is within the 400m (5mins walk) from public spaces. A total of 1 Km^2 (50%) of public spaces are within 5mins walk from any location along the street. When a 1,000m (10min) distance is used along the street, a total area of 23.4 Km^2 (82.7%) is accessible to public spaces leaving 4.9Km^2 as unserviced area.

Streets that are most accessible to public spaces within 400m (5 mins walk) accounted for 129.45 Km in length which is about 63% of the total street length in Jianghan District. A total of 181.53 Km street length is accessible within 10mins walk leaving only 23.4 Km of street that is least accessible to public spaces.

In order to ensure equal spatial distribution of public spaces and to ensure that every resident has equal access to public spaces, Jianghan has to ensure that they create public spaces in areas that are lacking, especially areas that have no public spaces within 10mins walk. Areas that have over provision or poorly located public spaces should be evaluated for land use change to ensue land use efficiency. This will create a network of public spaces that spans the entire district.

Streets in Jianghan should also be evaluated in terms of quality to measure how walkable the public space is for pedestrians and also if the spaces are easily accessible for cyclists. Streets with sidewalks especially those leading to public spaces should also be mapped out not only to promote walk-ability but also as areas of mixed-use.

COMFORT IN PUBLIC SPACES

Public spaces play the role of creating comfort and the quality of stay to the populations in urban areas. However, there are certain measures that are required to creating comfort in public open spaces.

The importance of comfort in public spaces is as follows:

- Promotes the use of public spaces
- Promotes public health of the people in the community
- Promotes social interactions in the public spaces
- Allows the use of open public spaces by a variety or of users

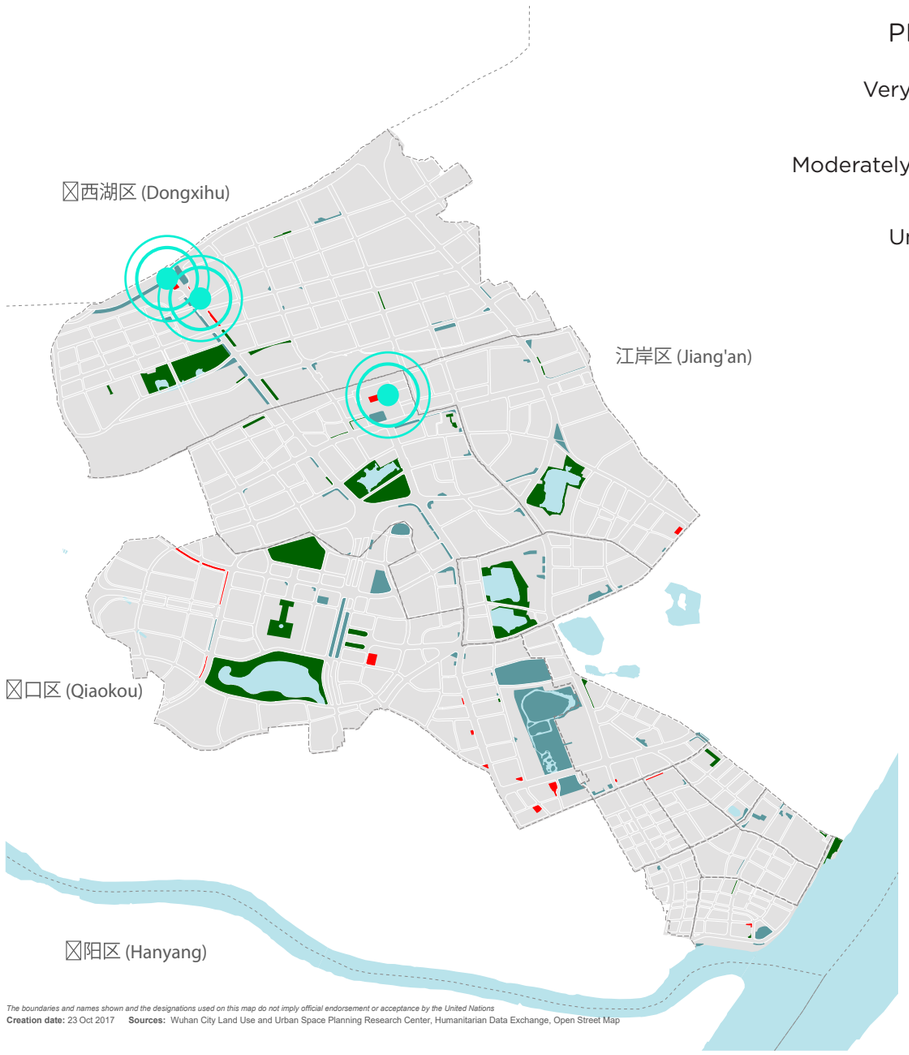
The main perceptions of comfort in open public spaces relates to:

1. **Comfort from natural environment** – the elements of nature like sunshine, snow, wind and rain may cause harsh conditions that reduce the use of public spaces and especially for young children and the elderly. Extremely sunny episodes may be uncomfortable for users of public spaces. For this reason, it is important for installation of shading to create comfort in the public spaces. Shading from sunshine can be done naturally or artificially. Natural shading includes the planting of trees to provide shade. Artificial shading includes the use of canopies or gazebos where people can shield themselves from harsh weather especially from sun and rain.

Strong winds can cause discomfort in the public spaces. Trees can act as natural wind breakers. In plazas and squares, comfort from wind is done by designing buildings in a way that block the full effect of wind from hitting the open public spaces.

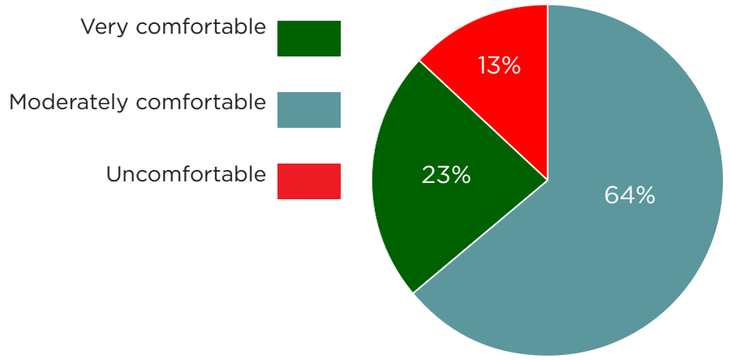
2. **Cleanliness** – this is mostly the first aspect of comfort that people consider before using public spaces. Cleanliness in public spaces includes collection activities like:

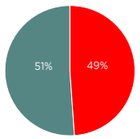
- **Provision of dustbins**, areas of garbage collection and frequent collection of garbage in public spaces. Since these are areas frequented by human traffic, there are great chances that they are also areas that receive huge amounts of trash from food and other plastic wrappings and therefore need to be regularly cleaned.
- **Provision of clean water** in the public spaces especially for sanitation purposes. Clean water is necessary to clean and maintain ablution and toilet facilities in public spaces. Without this, there will be odours and disease breeding zones in the public spaces.



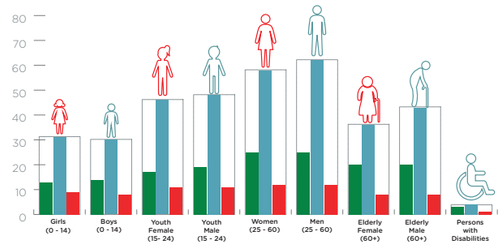
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations
Creation date: 23 Oct 2017 **Sources:** Wuhan City Land Use and Urban Space Planning Research Center, Humanitarian Data Exchange, Open Street Map

PERCEPTION OF COMFORT IN PUBLIC SPACES





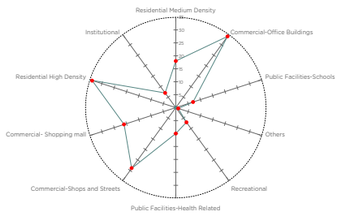
PROPORTION OF USERS IN PUBLIC SPACES PERCEIVED AS COMFORTABLE



An accessibility index of public spaces in Jianghan revealed that only 19% (27) are most accessible.

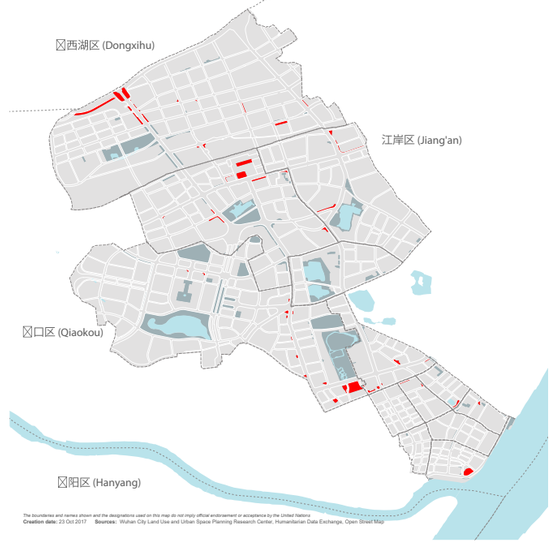
Very comfortable | Moderately comfortable | Uncomfortable

PUBLIC SPACES WITH NOISE LEVELS ABOVE 65 DECIBELS

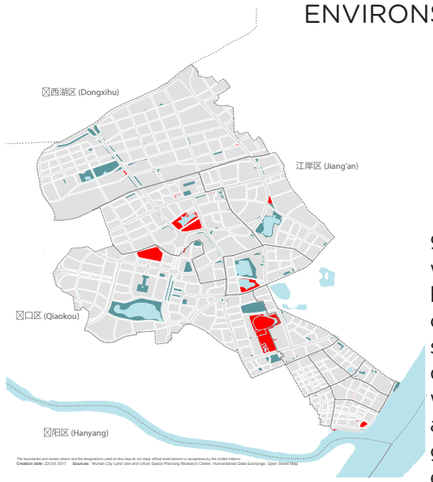


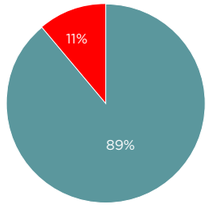
34	34	29	21	18
High Density Residential	Commercial-Office Building	Commercial-Shops, Streets	Commercial-shopping mall	Medium Density Residential

10	7	7	7	1
Public Facilities-Health related	Public Facilities-schools	Recreational	Institutional	Others



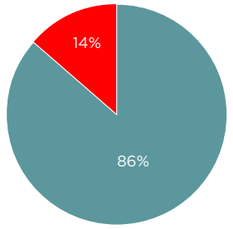
PRESENCE OF GARBAGE DISPOSED IN PUBLIC SPACE ENVIRONS





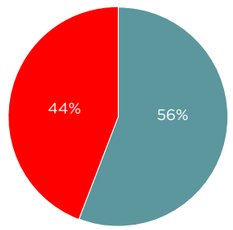
96 out of 111 public spaces with garbage bins did not have garbage dispposed on their environs .Public spaces with garbage disposed in their environs were 11% (16) while as many as 89% (125) did not have garbage disposed in their environs.

PRESENCE OF BAD ODOUR IN PUBLIC SPACES



Presence of bad odour was found in 20 (14%) public spaces, out of these 4 had garbage disposed in their environs, showing a slight correlation between garbage disposed and bad odour in public spaces

PRESENCE OF CLEAN WATER BODIES IN PUBLIC SPACES



Public spaces with water bodies were 16 (11%) out of all (141) public spaces in Jianghan District. 44% (7) of these were not clean.

d

24% (Pleasant view as incators of comfort)

Pleasant views in Public spaces in Jianghan were found in 102 public spaces, of these 24 (24%) were perceived as very comfortble while 8 (8%) were uncomfortable

(Gender balance as incators of comfort)

Public spaces that were perceived as very comfortable had a good representation of all ages groups as well as gender.

(Clean environs as indicators of comfort)

Public spaces with bad odor and garbage disposed on their environs were also assessed in Jianghan as indicators of comfort. Majority of these spaces were perceived as moderately comfortable.

100% (Noise levels as incators of comfort)

Public spaces with noise levels above 70db in Jianghan were 3 and all were perceived as uncomfortable.

(Presence of amenities as incators of comfort)

Essential amenities such as seating, artificial shading and garbage bins have a role to play in ensuring public spaces are comfortable. Majority of public spaces in Jianghan District. with these amenities have been found to be very comfortable

AMENITIES PRESENT IN VERY COMFORTABLE PUBLIC SPACES

24%

A comfort index of public spaces in Jianghan revealed that out of all (68) public spaces with seating infrastructure,24%(16)public spaces were perceived as very comfortable while only 9% (6) were perceived as uncomfortable.

23%

A similar result was found in public spaces with presence of drainage infrastructure, where out of a total of 56 public spaces, 13 (23%) were perceived as very comfortable while 4 (7%) were perceived as not comfortable.

43%

Presence of artificial shading has been linked to comfort in public spaces. Jianghan public spaces recorded a total of only 7 public spaces with artificial shading and out of these 3 were perceived as very comfortable while none were perceived as uncomfortable

23%

The mechanism of garbage disposal and collection is linked to the environmental comfort of public spaces. Jianghan had a total of 111 public spaces with presence of garbage bins, out of these, 25 (23%) were perceived as very comfortable while only 11 (1%) were perceived as not comfortable.

- Regular maintenance by trimming grass and hedges is important to improve the public spaces. Unkempt natural vegetation like overgrown grass and hedges can bring feelings of insecurity in the public open spaces.
- Air pollution can be a sign of cleanliness and therefore comfortable areas. Public Spaces near industrial zones of traffic zones may suffer from fumes from mechanization which create discomfort in the open spaces.
- For open public spaces like plazas and squares that allow public art, it is important that the art is in a way that is acceptable to all and is aesthetically pleasing. Graffiti on walls may not be welcoming for all limiting the use of such spaces. Public art should be maintained for the cleanliness of open public spaces.

3. **Provision of sitting space infrastructure** – public spaces require sitting areas for the elderly, physically challenged or those watching over children. Since the public spaces are areas for relaxation, it is important that there is sufficient sitting space. Providing such amenities also promotes the public health of the residents as the elderly can enjoy the open air and sunshine in the public spaces while seated as well as guardians of children using the parks.

4. **Noise levels** – comfortable open public spaces are those that are not filled with noise from surrounding activities or from traffic. To reduce noise levels, it is important that the open public spaces are places in areas of compatible land use. There are however, many methods to curb noise pollution in open spaces by buffering the open spaces with trees and other vegetation.

5. **Cultural comfort** – different social and religious groups have different requirements from public open spaces. Islam for example, requires decency in dressing and women may not venture into public areas where they perceive areas of indecency.

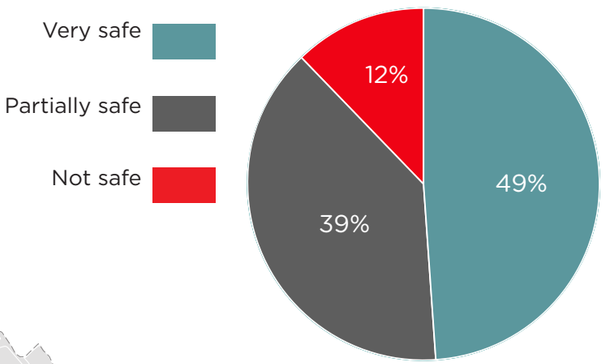
SAFETY IN PUBLIC SPACES

Safety in public spaces is perceived as an important element of both the quality of community life, and the effective management of cities. The fear of violence/crime and the perception that an environment is unsafe is a major obstacle to many people's use and enjoyment of public spaces. The issue of safety includes (fires, bullying, crime, violence, accidents, etc.). Women and girls fear and experience various types of sexual violence in public spaces, from unwanted sexual remarks and touching to rape and robbery. Parents usually fear insecurity in their neighborhoods and would not allow their children to go out and play if the neighborhood is unsafe, physical injuries that may occur in the playground, the uneven grounds and possible traffic risks. An aggregate of perception of safety during the day and at night revealed that 49% (69) of public spaces in Jianghan were perceived as very safe while 39% (55) were perceived as partially safe and a total of 12% (17) were perceived as unsafe.

The image of a public space also contributes to whether it will be utilized or not. If the public space environment experiences poor lighting and visibility, physical isolation, poorly maintained, and has a confusing layout, people avoid the place. Street lighting is seen as an indicator of safety in Jianghan, with 103 public spaces that have street lighting which accounts for 91% were perceived as partially to very safe at night. The condition of these street lighting infrastructure was also an indicator of perception of safety. In order to create an environment of safety and comfort, there is a great need to address these fears of personal safety and the actual safety in the community. While majority of public spaces (65%, 91)were perceived as partially safe at night, as many as 75 public spaces which accounts for 53% of all public spaces in Jianghan were perceived as very safe and a very small number of 10 (7%) were perceived as unsafe.

Previous research indicates that attracting and creating greater opportunities for public spaces use by women, children and seniors in particular, is an important first step for enhancing safety. Community involvement in the design and planning of public spaces is essential in alleviating the perception of insecurity. While planning and designing safe public spaces, physical features of a space with special focus on lighting, landscaping, visibility, motorized traffic, pedestrian traffic, urban furniture, potential hiding spots, signage, security personnel, proximity to other public spaces, proximity to emergency services, and access to public transportation should

PERCEPTION OF SAFETY IN PUBLIC SPACES



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Creation date: 23 Oct 2017 **Sources:** Wuhan City Land Use and Urban Space Planning Research Center, Humanitarian Data Exchange, Open Street Map

9% Percentage of PS with crime incidence

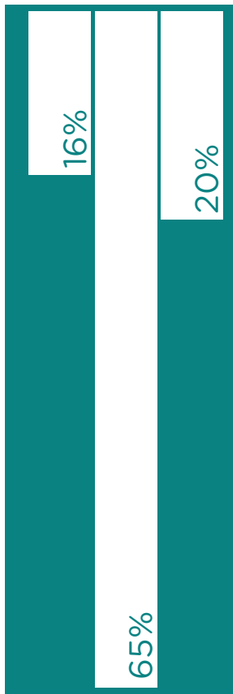
6% Percentage of PS with traffic accidents

9% Percentage of PS with traffic accidents along adjacent streets

97% (CCTV as indicators of safety)

The result of the citywide assessment found that 97% of the public spaces with CCTV cameras were perceived as partially to very safe during the day.

50% of the vandalized public spaces had no CCTV cameras. 64% (90) of all public spaces with CCTV camera were found to have no crime incidence.



91% (street lighting as indicators of safety)

Out of the 113 public spaces that have street lighting, 103, which accounts for 91% were perceived as partially to very safe at night. This results shows the importance of street lighting in making public spaces feel safer.

The condition of the street lighting infrastructure was also linked to safety of public spaces. 53% (60) of all public spaces with street lighting were in good condition, out of these, 56 public spaces were perceived as very safe at night.

be put into consideration. Traffic accidents in public spaces and along adjacent streets that occurred within 3-4 weeks of the survey were also assessed. Only 9 (6%) had incidence of traffic accidents in the public spaces while 12 (9%) public spaces had records of traffic accidents along adjacent streets. This was based on interviews conducted during the survey.

The design of streets and places can reduce crime and anti-social behaviors making places and spaces feel safer, which in turn can enhance the physical, mental and social well-being of community members.

According to research done by Yue, Zhu, Ye, & Guo (2017), crimes that occurred frequently in Jianghan District were robbery, e-bike theft, fraud and burglary. The study shows that most e-bike thefts took place around 15:00 and 18:00 pm while robberies mostly took place during evenings. These are times when people tend to go for entertainment from work, and the night provides many opportunities for crimes to occur. However, interviews conducted during the assessment revealed that a small number of public spaces 13 which accounts for 9% had incidences of crime while none of the public spaces had anti-social behaviors. Jianghan District can take appropriate measures to ensure that they address the actual crimes and ones recorded in public spaces. The City council should ensure that there are well-lit streets and widened sidewalks. This will increase pedestrian traffic and help minimize crime in the region. CCTV cameras has also been seen as an indicator of safety. 50% of the vandalized public spaces in Jianghan had no CCTV cameras and 64% (90) of all public spaces with CCTV camera were found to have no crime incidence.

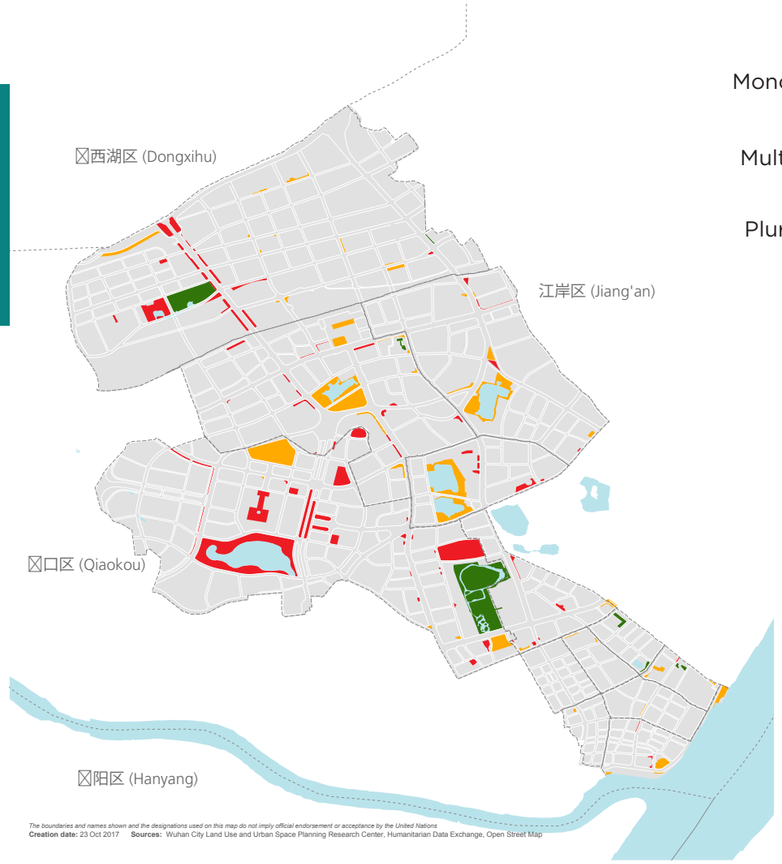
Urban public spaces should have mixed uses and activities, for diverse user groups at different times of the day to provide natural surveillance systems, in that there is reduced isolation and encourages surveillance by local residents and business people and therefore creating a feeling of safety. Investment in street lighting in public spaces and streets used at night can improve safety and surveillance and increase usage. Additionally, ensuring constant maintenance and providing child friendly outdoor play space in the community promotes safety in public spaces.

USE ASSESSMENT

The significance of public space can be seen from the perspective of an individual, a community or a city. Public space is a space with features that allows the people to spend time and enjoy their life regardless of their differences. There are several ways to transform a place into a destination, people go somewhere because there is an activity - something to experience. Majority of public spaces in Jianghan are non-organized and levels of staying activities differ. Most activities in Jianghan's public spaces is socializing, such as discussions, chatting, siting, standing, resting, eating etc. This shows a potential of public spaces in Jianghan District to become lively due to the presence of staying activities.

Public spaces can be mono-functional meaning they are limited to only one activity. These spaces are mostly perceived as unsafe. In Jianghan majority(57%, 80) of the spaces were recorded as mono-functional public spaces. This shows that Jianghan suffers from a lack of spatial comprehension with little planning consideration for the human scale. The remaining public spaces were multi-functional (21%, 31) and pluri-functional (22%, 32).

Public spaces that are multi-functional or spaces that are used for different types of activities at different times of the day are usually perceived as safe. The assessment showed that majority of pluri-functional (spaces with different kinds of activities at the same time) and multi functional public spaces were found to be very safe to partially safe. None were perceived as unsafe.

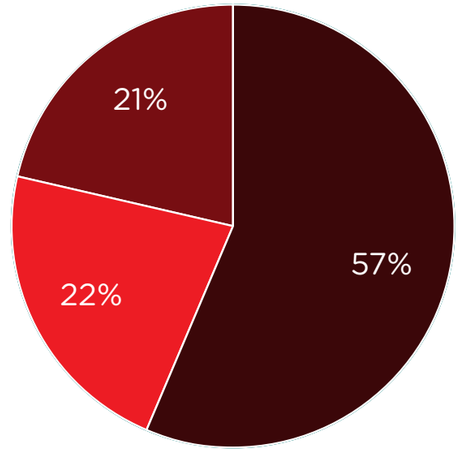


Mono - functional public space

Multi - functional public space

Pluri - functional public space

USE OF PUBLIC SPACES



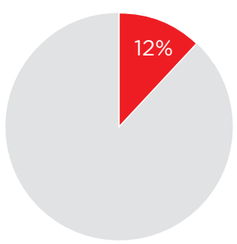
65% (Multi-functionality as an indicator of safety)

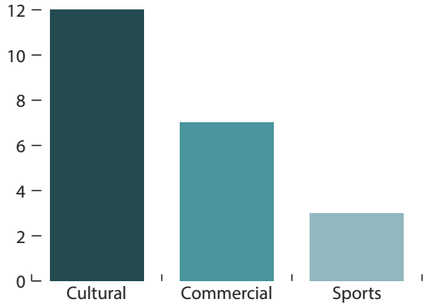
63% (Pluri-functionality as an indicator of safety)

Public spaces that had multi-functional activities accounted for 31 of all public spaces. Out of these 65% (20) were perceived as very safe while the rest (35%, 11) were perceived as partially safe. None were perceived as unsafe.

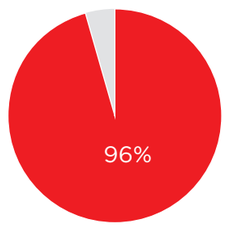
A similar result was found in pluri-fuctional public spaces, which accounted for 32 of the total public spaces. Of these, 63 % were perceived as very safe while the rest 37% as partially safe and none were perceived as unsafe.

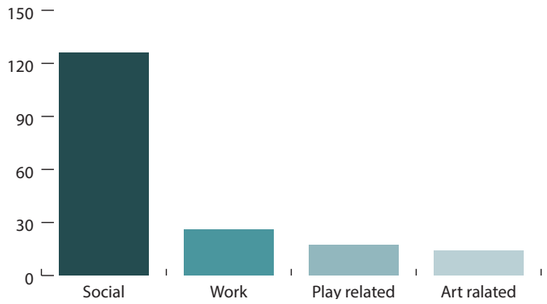
ORGANISED ACTIVITIES IN PUBLIC SPACES





NON-ORGANISED ACTIVITIES PUBLIC SPACES





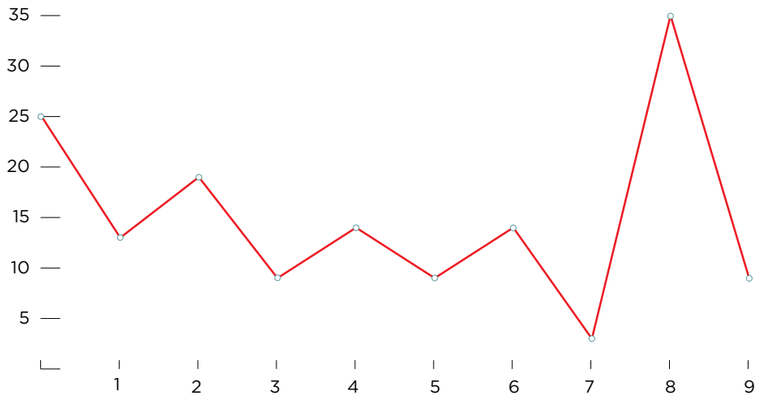
59%
(Women as indicators of safety)

Gender survey conducted in Jianghan's public spaces shows that out of the 141 public spaces, 83, which accounts for 59%, were perceived as very safe during the day as they had a well representation of women present during the assessment

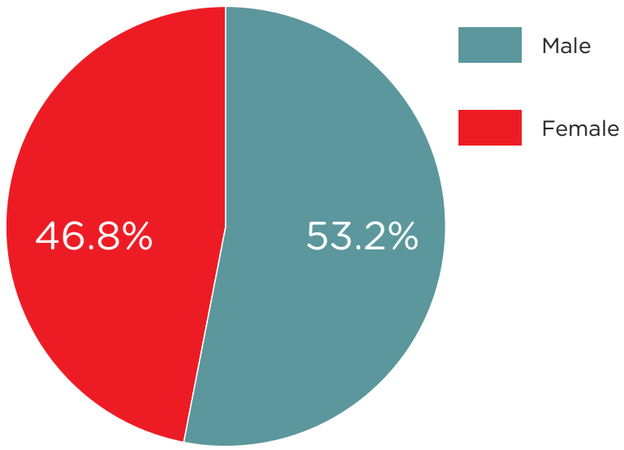
Only 8 public spaces out of 141 which accounted for 5.7% had persons with disabilities during the time of assessment

Assessment shows that pocket parks have the most number of users, and gender balance

USER INDEX FOR PUBLIC SPACES

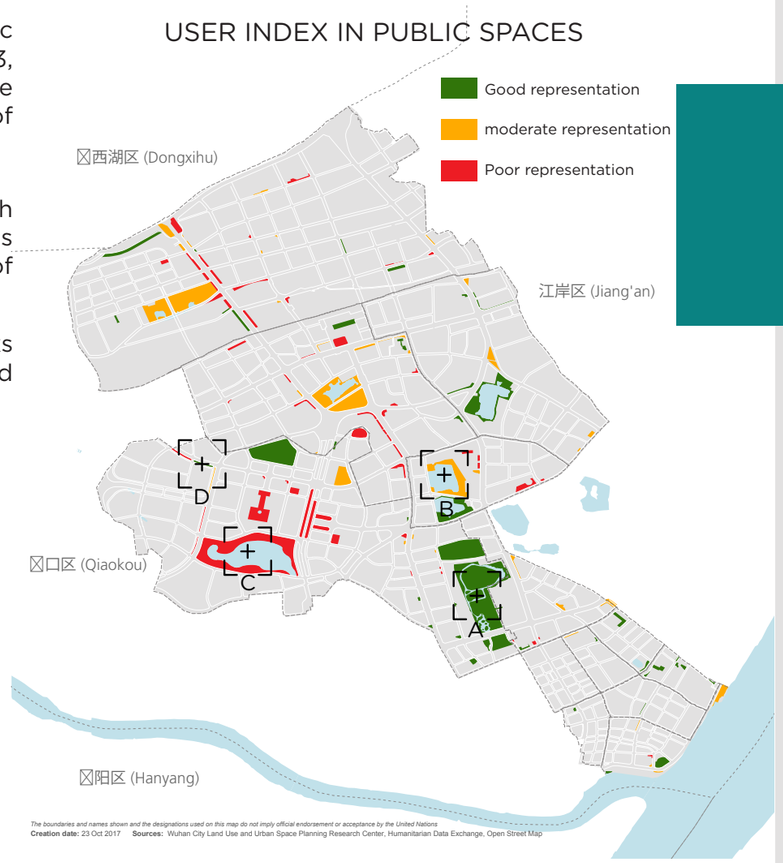


GENDER DATA FOR PUBLIC SPACES

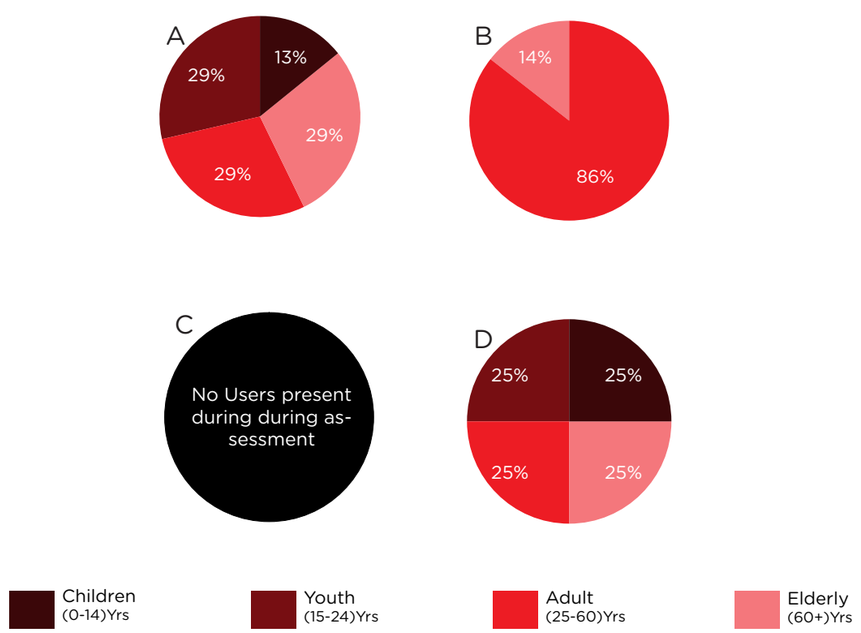


Data used for this assessment is based on time of survey and was conducted during a weekend.

USER INDEX IN PUBLIC SPACES



AGE DATA FOR SELECTED PUBLIC SPACES



USER ASSESSMENT

Planning and design of public spaces that focuses on inclusivity of all gender should start with an inventory on who doesn't use a particular public space, when, and why. This is because when certain groups, like women or girls, do not use a space, it is usually an indication that the space feels insecure to members of that group. Public spaces with an equal representation of both age and gender has often been perceived as safe.

A user index was analyzed to understand the distribution of gender and age in public spaces in Jianghan. The index represents public spaces with the most number of age groups within a public space. The index took a range from 1-8 representing 4 age groups(0-14, 15-24, 25-60, 60+) both female and male. Majority of public spaces, mostly pocket parks had a good representation of both age and gender. However, quite a number of women and men age 25-60 can be found in public spaces but very few children (age 0-14) use public spaces for recreation. Persons with disabilities were least (5.7%, 8) represented in public spaces.

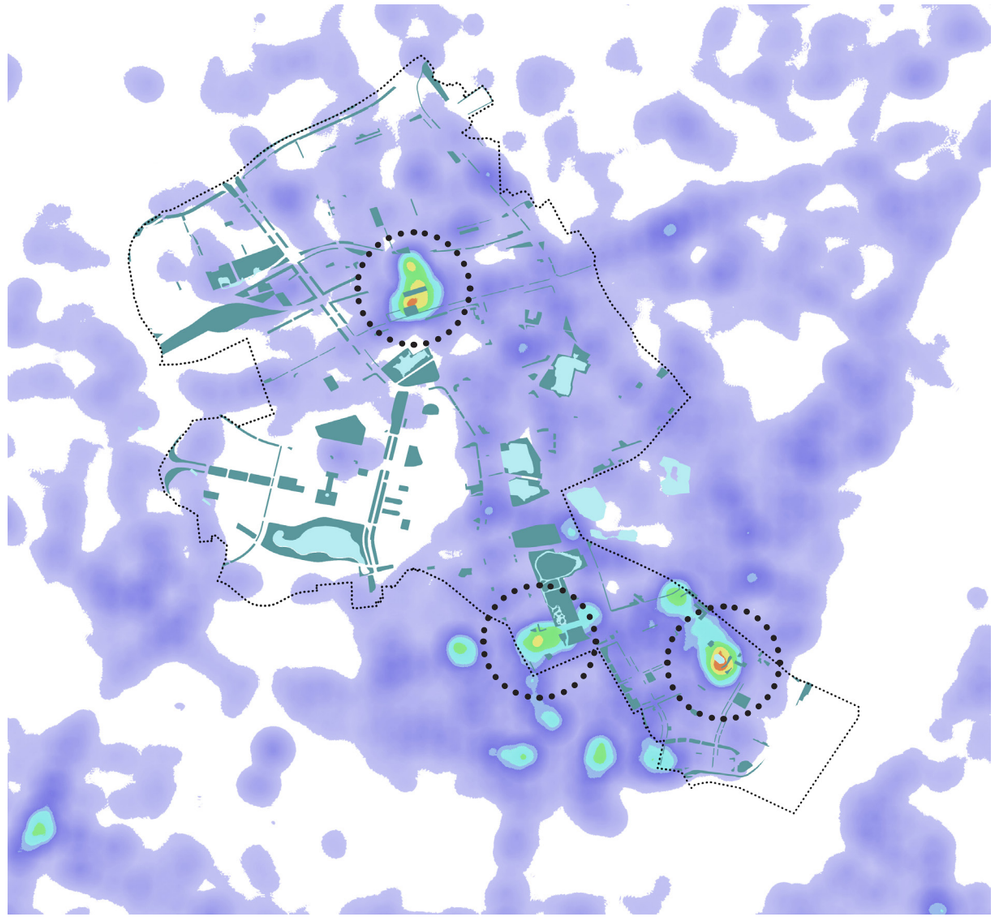
A map of the user index showed a good representation, moderate representation and poor representation. A selection of public spaces was used to better understand the distribution of age and gender. Poorly representative public spaces have 2 to none of the age groups, while good represented public spaces have an almost equal representation of all user groups.

THERMODYNAMIC ANALYSIS

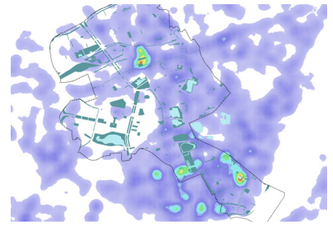
This section explore the utility of big open data through the Baidu Maps platform for integration with the city-wide public space survey results. Baidu Mpas is able to obtain space-time paths from geolocated data. The resulting map is a thermogram of pedestrian and traffic activities. This results was made with the thermographs between April 28th 2017 to May 1st 2018, May 9th 2017, May 13th 2018 and May 14th 2018.

The thermogram map of pedestrians and traffic was overlaid with the public space to map the mobility patterns associated with different types of public spaces in order to unveil potential areas of social exclusion: public spaces which are less visited by people living relatively near, who prefer further spaces. It was also used to identify public spaces that have activities happening adjacent to them and if these public spaces have amenities and infrastructure to support these activities.

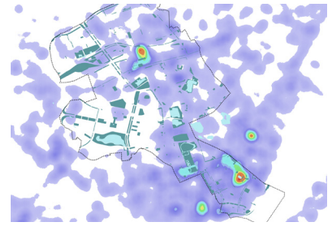
PUBLIC SPACES WITH HIGH ACTIVITY ADJACENT TO THEM



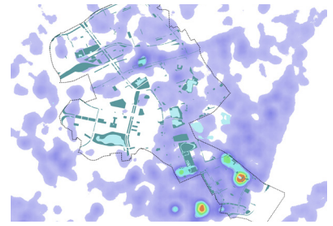
28th April 2017-1628Hrs



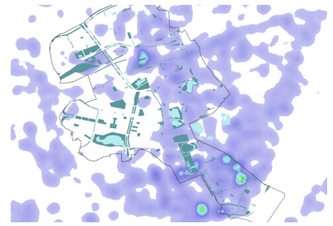
29th April 2017-1618Hrs



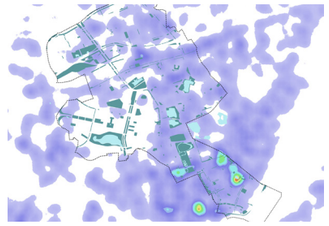
30th April 2017-1321Hrs



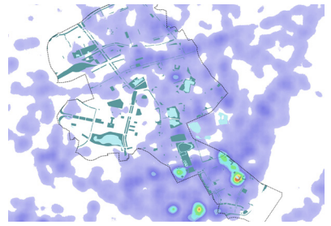
1st May 2017-1313Hrs



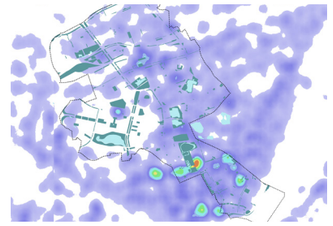
14th May 2017-1431Hrs



13th May 2017-1431Hrs

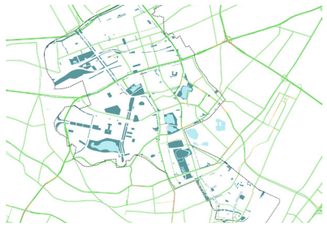


9th May 2017-1214Hrs



28th April 2017-1904Hrs

29th April 2017-1413Hrs



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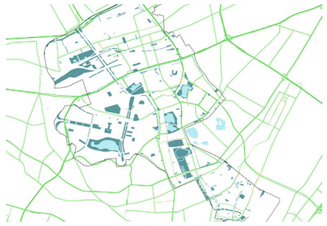
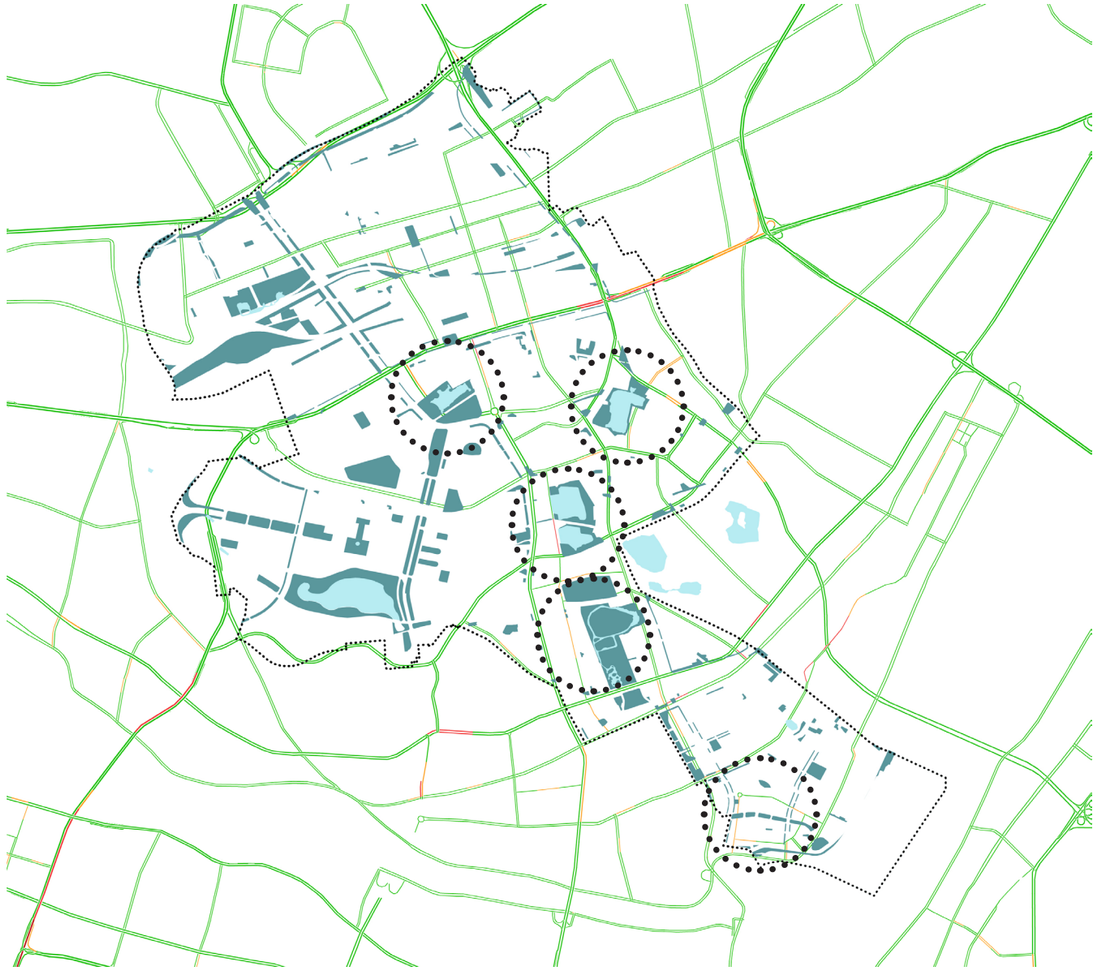


1st May 2017-0913Hrs

5th May 2017-1920Hrs

PUBLIC SPACES WITH HIGH VOLUME OF TRAFFIC ADJACENT TO THEM



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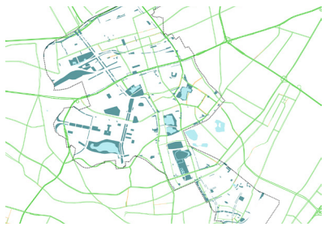


Accessibility affects the location of activities in urban areas such that areas with congested transport infrastructure will attract few investors and in some cases cause others to relocate to other areas which have free mobility trends. This is because congested areas affect the service delivery due to time taken to move from one point to another and also the issues of safety and security to both pedestrians and motorists arises.

The streets of Jianghan should offer numerous experiences, that appeal to the senses and enrich the walk. However, the pedestrian accessibility and pleasure is affected by a range of factors. Easy and comfortable walking requires space to walk freely without being disturbed by physical elements, parked cars, vehicular traffic, bicycles or other people. In Jianghan, there are bicycles parked on sidewalks, making it very difficult to walk along them.

The thermodynamic maps offers a clear picture of the most used roads and sidewalks, and offers an opportunity to investigate why the others and not used and what can be done to upgrade and improve them. It also clearly shows the public spaces that are close to these activities and what can be done to improve their accessibility, safety and amenities to cater for the large volume of users.

- How Safe?
- How Inclusive?
- How Accessible?

“But man is a part of nature, and his war against nature is inevitably a war against himself”

Rachel Carson

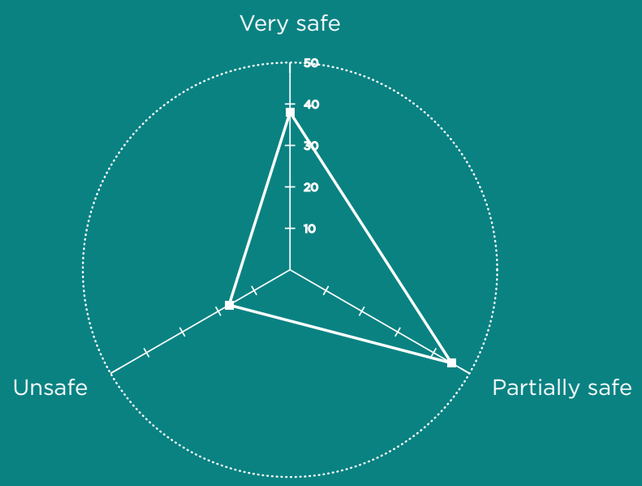
SUMMARY FINDINGS

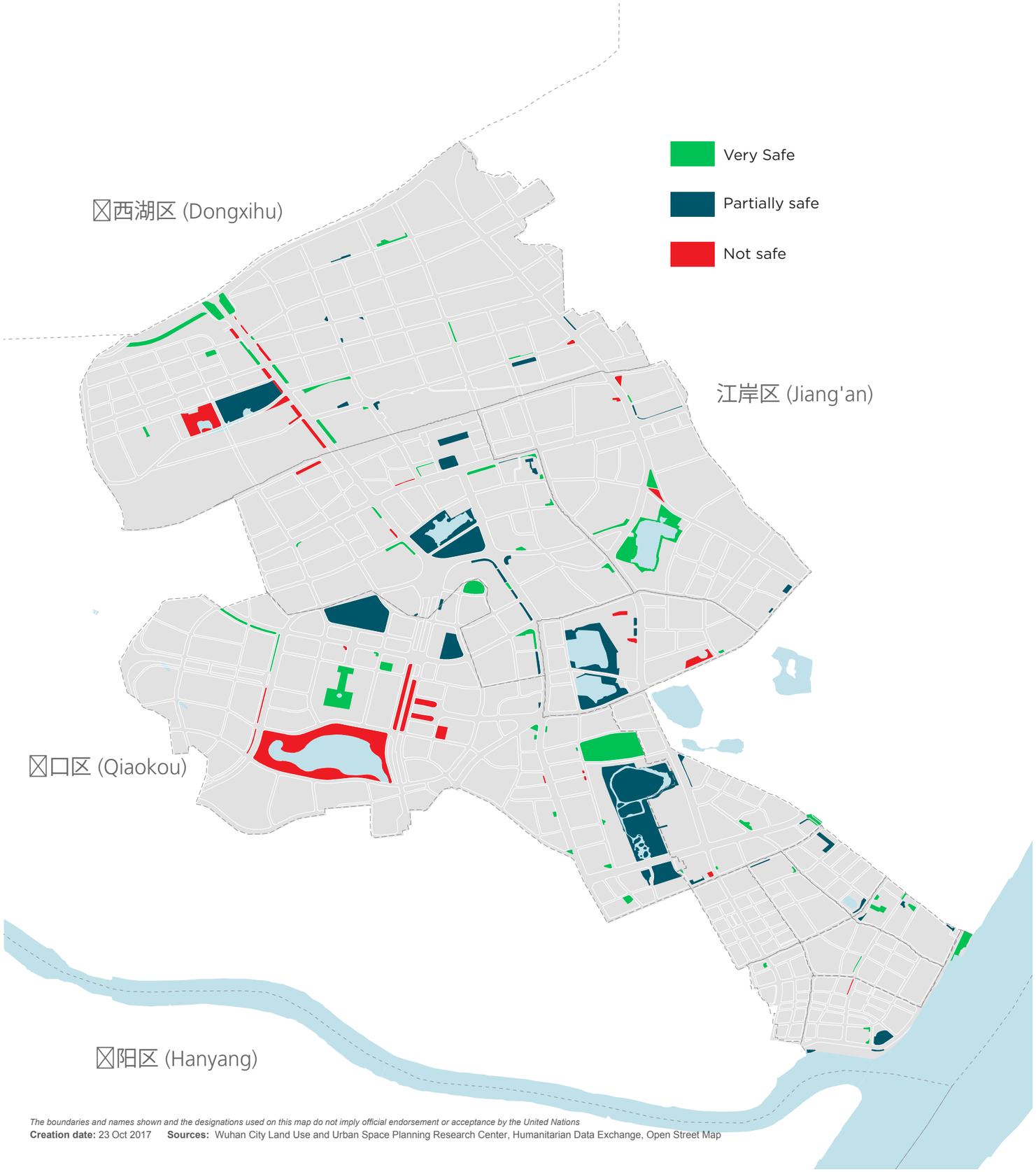
HOW SAFE?

The main aim of the city wide public space assessment in Jianghan was to assess the quality, distribution and accessibility. This assessment also informs on how safe the public spaces are in Jianhan. Safety is an important factor as it directly affects the use and comfort of public spaces. Unsafe extents often creates fear that plays a key role in users' access and experience in public spaces.

Vandalism, crime incidences, anti-social behavior, traffic accidents, safety levels at night and presence of CCTV cameras were all put in consideration to come up with an aggregate index that was used to rank public spaces' safety. The indexing reveals that 38% (53) were perceived as very safe, 45% (63) were perceived as partially safe while 17% (25) were perceived as unsafe.

Creating safe public spaces requires involvement of all stakeholders. Community participation in the design, creation and management of public spaces ensures ownership and use of public spaces and thus safety.





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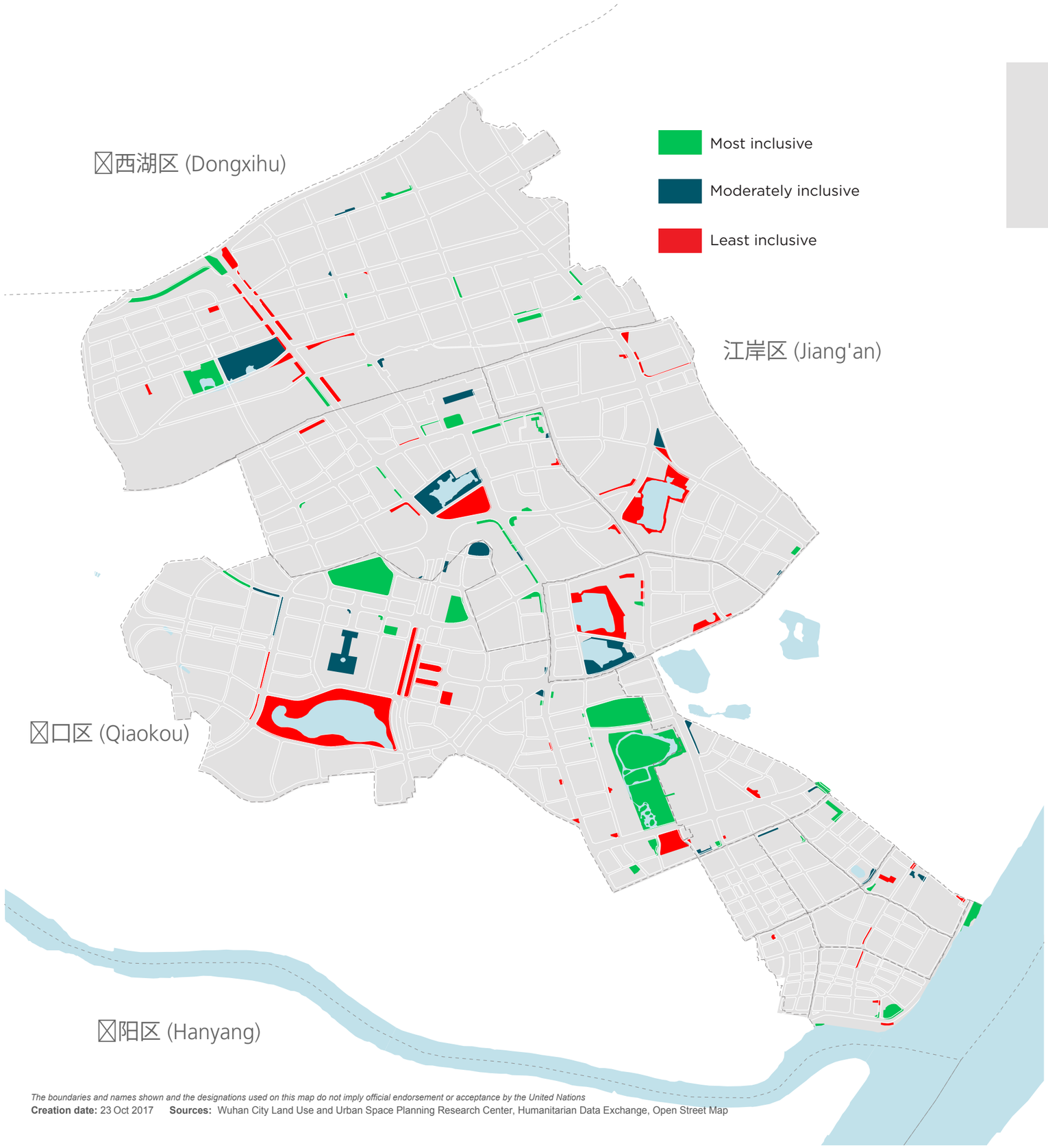

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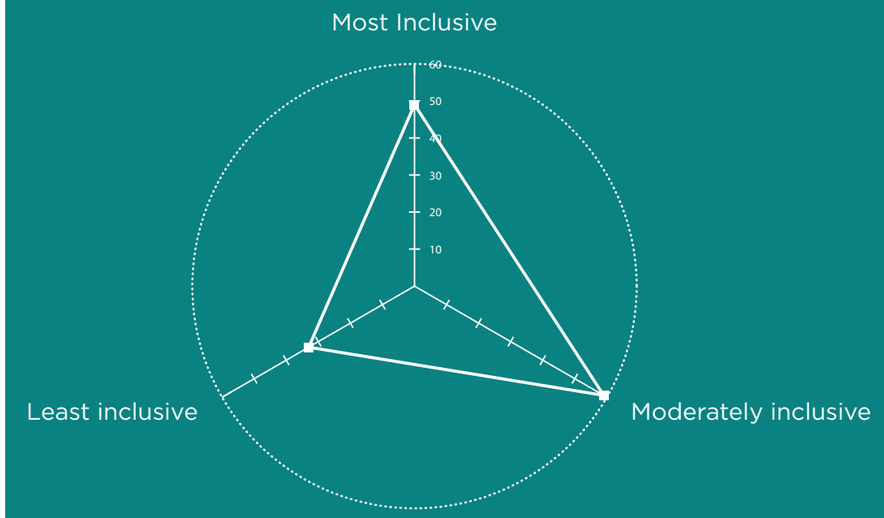
HOW INCLUSIVE?

Public spaces are essentially aimed at improving quality of urban life. This has to be extended to all users regardless of age, gender or disability. Presence of infrastructure for access and amenities for use are key indicators in determining how inclusive public spaces are. Access infrastructure such as bike lanes, parking lots, wheelchair access lanes, signage and pedestrian lanes provide access to different users. Amenities such as seating furniture, artificial shade, children's playing facilities, toilets and safety features in general are indicators of comfort and should suit all users.

As a measure for this, an index was evaluated considering comfort, accessibility, safety and physical amenities. This reveals that 35% (49) of public spaces were percieved as the most inclusive, 42% (59) were percieved as moderately inclusive and 23% (33) were percieved as least inclusive.

Inclusivity can be best achieved through community participation, better designs better management of public spaces.

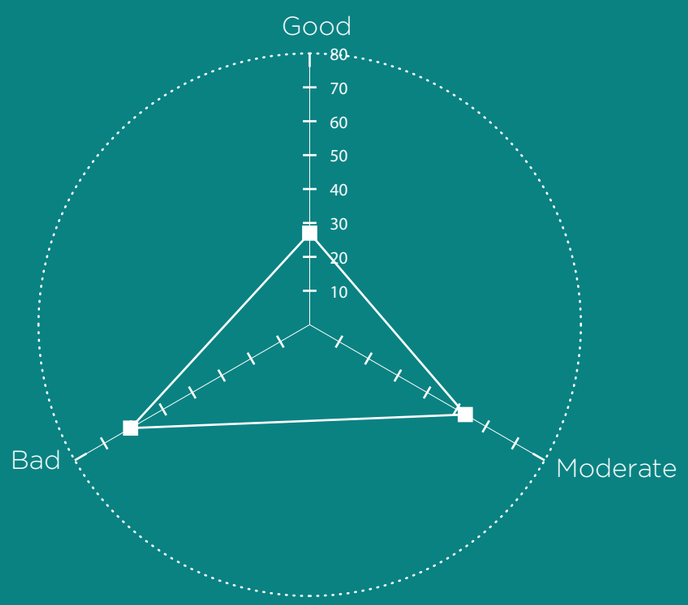


HOW ACCESSIBLE?

Accessible, safe and inclusive public spaces are important ingredients for bridging the inequalities in public space and the urban divide. As such, the availability, location, management of public space and deployment of support infrastructure has an impact on the accessibility and inclusiveness of public spaces.

The accessibility assessment was based on various factors that were overlayed to obtain a weighted aggregate that was used to measure the accessibity of a public space. The factors that were put in consideration were level of access to a public space, i.e, restrictions, condition of infrastructure and its ad aptiveness to all users. The weighted classification based the assessment shows that 19% of all the public spaces are most accessible while 43% are least accessible.

To enhance accessibility, Jianghan should consider improving infrastructure to access public spaces for all users regardless of age, gender and disability. It is also important to ensure that public spaces are free for all with clear and defined entrances.



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“

If you plan for cars and traffic, you get cars and traffic. If you plan for people and places, you get people and places

Willian H. Whyte (1980)

”

- Policy Recommendations
- Proposed Pilot Projects
- Vision and Goals
- Objectives and Strategies To Achieve Vision
- References

“If you plan for cars and traffic, you get cars and traffic. If you plan for people and places, you get people and places”

Willian H. Whyte (1980)

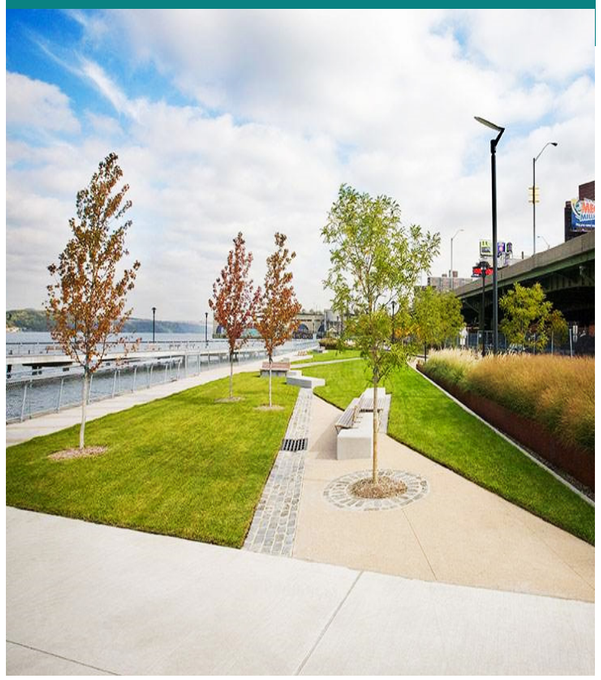
WAY FORWARD

POLICY RECOMMENDATIONS

DEVELOPMENT STRATEGIES

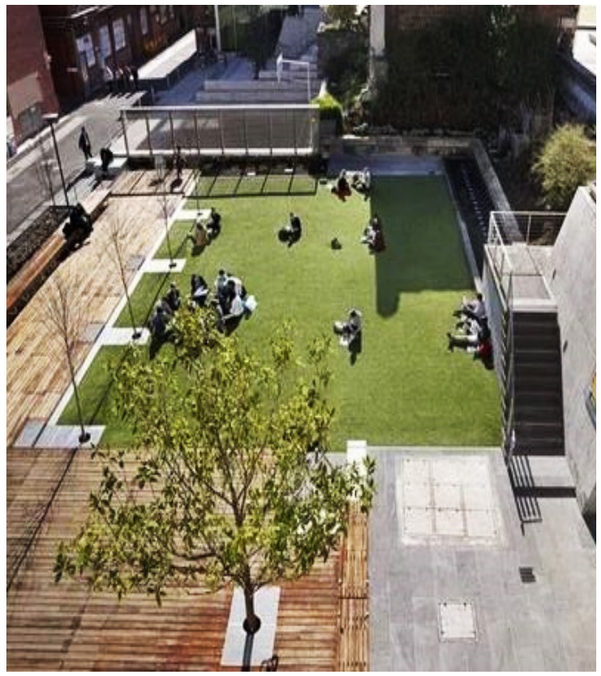
TO ADD NEW GREEN AREAS AMID CITY REGENERATION

On one hand, in areas of redevelopment, new park greens will be added in accordance with the unified regulatory planning; on the other hand, in areas of rehabilitation, new green spaces will be added by demolishing temporary or illegal buildings.



TO ENCOURAGE THE SHARING OF EXCLUSIVE GREEN SPACES

The green spaces inside of large-scale institutions or gated communities will be opened for public sharing. And the lateral spaces of public buildings will be transformed into more intimate and flexible green areas so as to enhance overall green coverage.



TO ACTIVATE NEGATIVE SPACES

By opening up the boundaries and introducing public facilities, negative spaces will be activated to attract and accommodate diverse activities, improving the vitality and quality of spaces.

TO DEVELOP THREE-DIMENSIONAL GREEN AREAS

Green areas on building roofs, walls, viaduct piers and other structures will be added so as to realize an all-round, multi-dimensional green coverage, enriching the forms of green spaces.

DEVELOPMENT PHASES

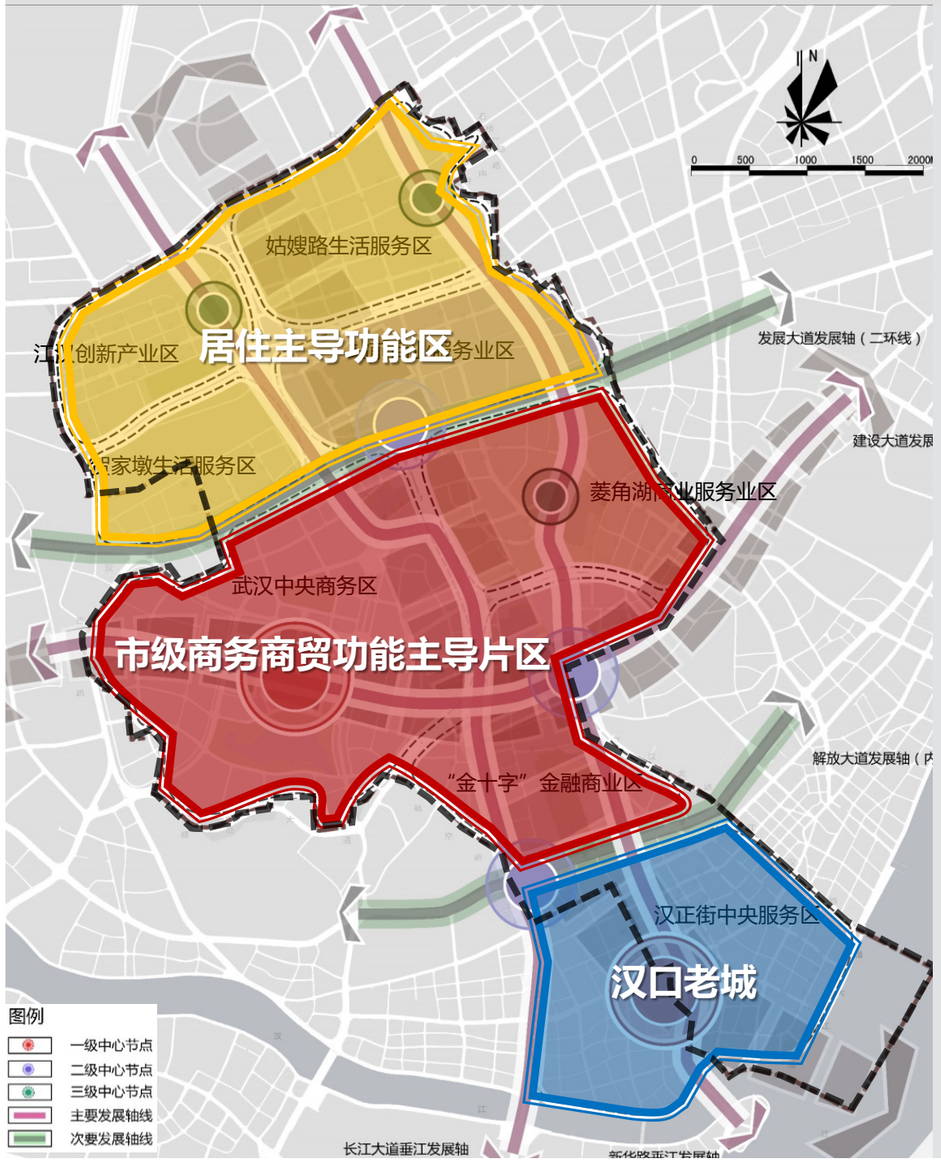
Phased development, gradual implementation

To upgrade the urban green standard of Jianghan district and achieve the planned objectives, a phased implementation is proposed, combining near-term and long-term projects.

	KEY DEVELOPMENT OBJECTIVES	KEY PROJECTS
Near-Term development (2017-2022)		
The phase for incremental development and quality upgrading	Key projects at this phase are the upgrading of urban parks and the development and connecting of the greenway network, in combination with the regeneration of old urban areas and the implementation of the regulatory planning of green spaces. The development of various green axes, green belts and greenway networks will be completed and the key areas will be optimized and upgraded so as to achieve the objectives of a per capita park green area of 4.2m² /person, and an overall green coverage 35%.	Park upgrading project Greenway network connecting project
Long-Term development (2023-2030)		
The phase for quality upgrading supplemented by incremental development	Through development of projects such as the three types of small green areas, three-dimensional greening and community greening, per capita park green area is expected to reach 5.2m² / person in 2030 with an overall green coverage of 40%. A green space framework with "One Belt, Two Axes, Three Zones and Multiple Nodes" will be established in Jianghan District, and ultimately achieve full coverage of green spaces.	Three types of small green spaces Three-dimensional greening Community greening

ZONE-SPECIFIC GUIDELINES

Potential tapping in the north zone, strengthening in the central zone, and enhancing in the south zone



Residential-dominant area – ecology and livability
Potential tapping in the north zone: To create small community green spaces

Municipal business and trade area – To display urban image
Strengthening in the central zone: Wangjiadun sponge city pilot, quality improvement of important lakes, building of the lake-front greenway network

Enhance the South zone: the Y-shape central green corridor of Hanzheng Street; inserting of new green spaces wherever possible

PROPOSED PILOT PROJECTS

CITY-WIDE PUBLIC SPACE INVENTORY AND ASSESSMENT

PROPOSE PILOT PROJECTS

MINECRAFT AS A PARTICIPATORY DESIGN TOOL TRAINING

PREPARE DESIGN GUIDELINES FOR SELECTED PUBLIC SPACE TYPOLOGIES

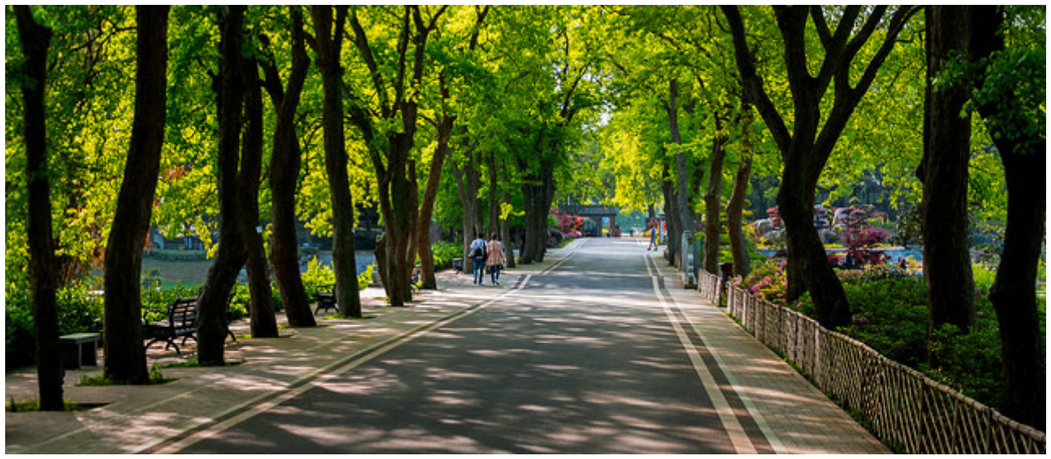
CITY-WIDE PUBLIC SPACE STRATEGY

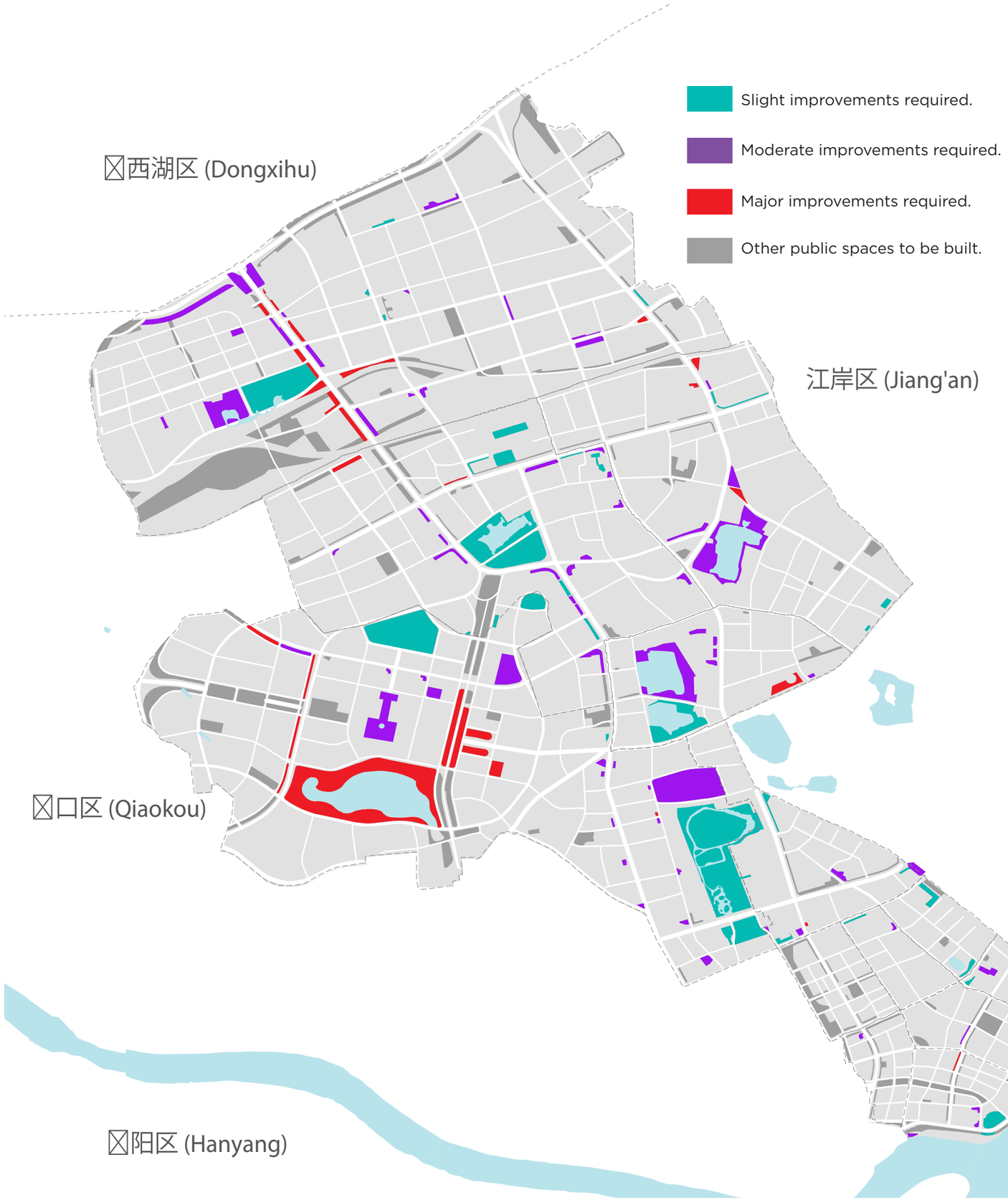
ACTION PLAN

MONITORING AND EVALUATION

The city-wide public space inventory and assessment in Jianghan identified gaps in the safety, accessibility and inclusivity of public spaces. Its also investigated the accessibility of public spaces, the quality and quantity, spatial distribution and the network of public spaces within Jianghan district. These were to further identify public spaces that require attention, that lacked amenities, were very unsafe, were non-functional, were perceived as uncomfortable or lacked gender and age balanced etc. These spaces were identified through an aggregate and a map was prepared to show the three categories of improvement that is needed, slight improvemnt, moderate improvement and major improvement needed.

The city of Jianghan should investigate their public spaces and prioritize those that require major improvements and include them in their workplan. This will ensure that public spaces in Jianghan are functional, and through better design and management, these spaces will be of high quality and characteristic.





PUBLIC SPACES FOR IMPROVEMENT

The aim of the city wide assessment is to inform on areas where facilities may be lacking, areas where there might be over provision, poorly located public spaces and where there are opportunities for improvements to meet the local needs. This provides a basis for evidence-based policy making and allocating resources and developing frameworks for the protection and revitalization and management of public space.

Based on the overall assessment, a weighted aggregate was obtained and used to determine public spaces that require improvement based on comfort, accessibility, green, safe, and inclusivity. 21% (29)off all public spaces require the most improvement while 29% (41) require the least improvement measures.

This information is useful in identifying which public spaces requires upgrading. It also provides a case for Jianghan district to prepare annual action plans that identifies key stakeholders working on public space and incorporate public space rehabilitation projects in their work-plan and municipal budget.

VISION AND GOALS

Vision: Public Spaces in Jianghan District to be of High Quality, More Accessible, Unique and Diverse.

High Quality

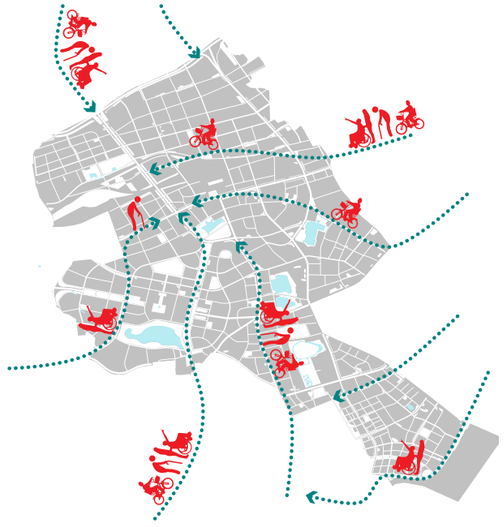
The quality of public spaces is a primary factor to be measured when evaluating the attractiveness of a city for investment and making it an attractive place to live, work and play.

As mentioned earlier, majority (57%, 80) of the spaces in Jianghan were recorded as mono-functional public spaces. Notwithstanding, the district has a potential of increasing the quality of its public spaces. To achieve this, the intensity of use, the intensity of social activities, the duration of activity, the variations in usage, and the diversity of use in public spaces should be enhanced through better design, management and maintenance.

More Accessible

As many as 43% of public spaces were considered as the least accessible and only 19% were considdered as the most accessible. Jianghan District can take advantage of its street grids to increase connectivity and accessibility of its public spaces. Access and connectivity is important in regard to public spaces as it creates social cohesion, allowing the built environment to be connected to the streets and the open spaces. It also allows people to easily move from their work stations to enjoy public spaces and back to work in a short period of time.

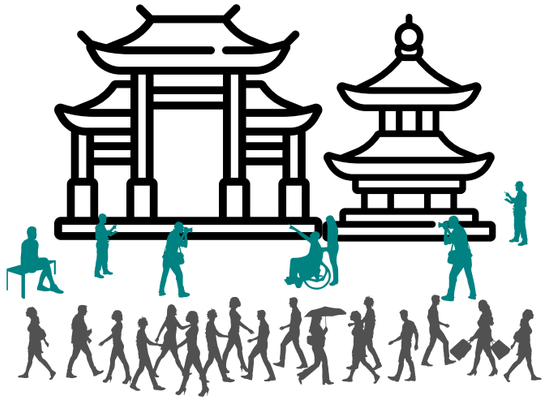
Increased connectivity in urban areas may also help to increase property values in the area as everyone wants to live in areas that have good quality public spaces.



Unique and Diverse

The district itself is unique in character; having the new town, at the northern part of the district, which is mainly for residential use, the central area which is the main commercial district and a centre of trade and commerce and the old town of Hankou which is a historic town which hosts a rich mix of culture and heritage.

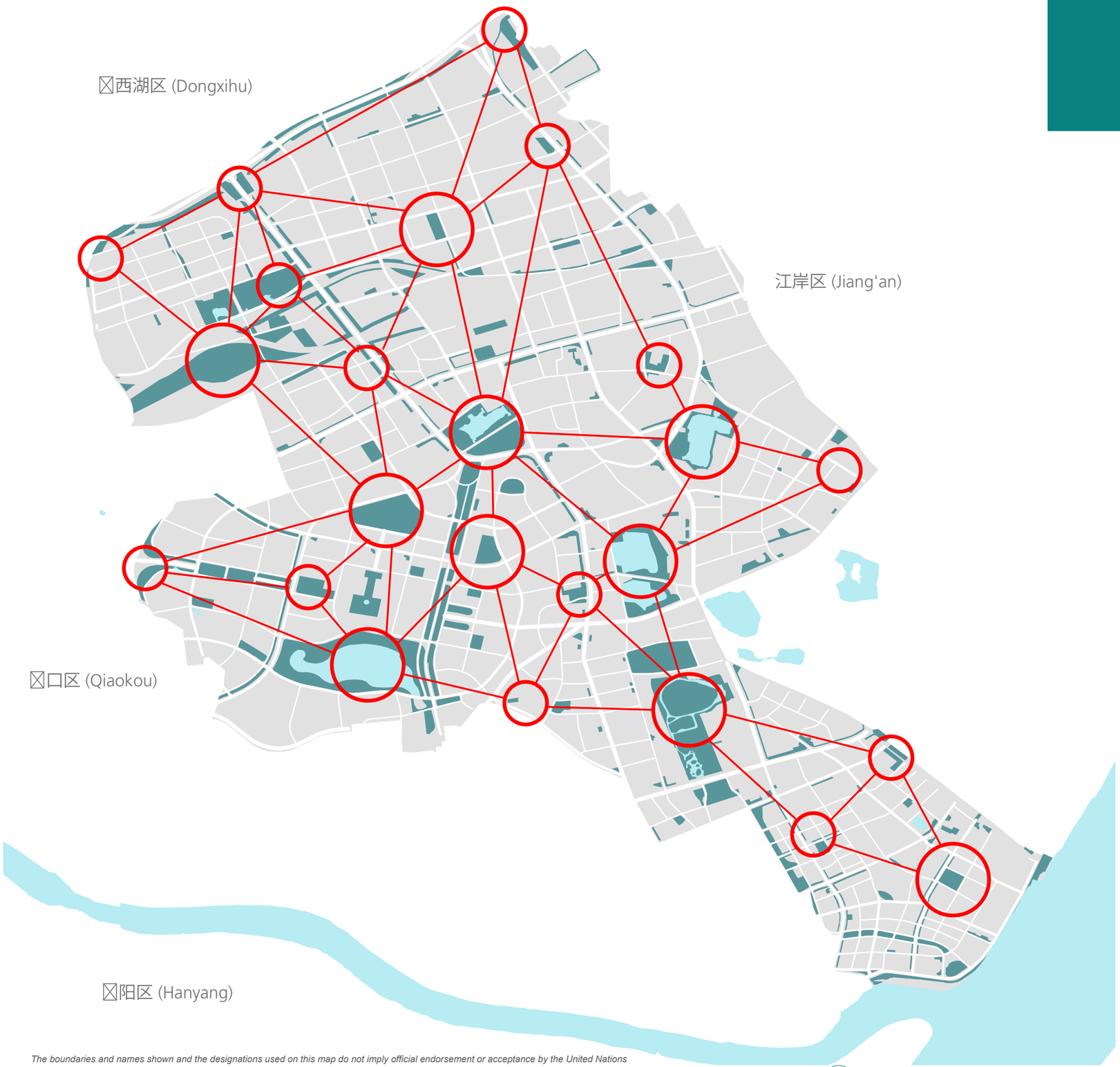
Jianghan District should envision public spaces where culture, heritage and modernity do not conflict. Promotion of culture as a catalyst of public space development where these historical and cultural attractions are well connected by public transport and embedded within a network of high quality public spaces in the entire district. This will not only attract tourism in the district of Jianghan, but will also enhance the local economy.



CELEBRATING JIANGHAN'S POTENTIAL

Jiangshan District has many unique qualities which makes the district one of the most exciting and significant areas within Wuhan city. The Yangtze and Han rivers that supports transportation, the lakes within the district which are part of creating an ecological garden district, the beautiful parks, and the unique character between the new town and the old town of Hankou etc. Its economic strength is a major advantage of the district. These qualities offer a significant value to Jianghan District on which the district can capitalize on.

The district is characterized by an aging population, low stock land and fragmented public spaces which provides very limited strategies to develop public space. To achieve its vision of high quality, more accessible, unique and diverse public spaces, Jianghan District should take advantage of it's immense potential.



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GOALS

PROTECTION

Public space should always remain public. There is an increasing proportion of privatization of public space in towns and cities, for example, from exclusive shopping malls and waterfront developments to suburban gated communities. Furthermore, in many towns and cities some public spaces are not maintained and become derelict, their vibrancy and potential lost. Public space should always remain public. There is an increasing proportion of privatization of public space in towns and cities, for example, from exclusive shopping malls and waterfront developments to suburban gated communities. Furthermore, in many towns and cities some public spaces are not maintained and become derelict, their vibrancy and potential lost.

Jianghan District is the most densely populated and least spacious of the districts in Wuhan. This district is grappling with limited land. As a result of these, public spaces are being threaten by the expanding city structures and grabbing for private development. The district undertook a city-wide public space inventory and assessment to identify the share of land that is public space, the per capita green area but most importantly the location of these spaces with the aim of protecting them.

Jianghan District needs to work in close partnership with residents of the district, NGOs, private sector and other key stakeholders in an effort to not only reclaim those public spaces that have been grabbed but also to protect the ones that exist now. Signage and acquisition of ownership documents is also another means of protecting public spaces.

The district should formulate policies and laws that ensure the protection of public spaces, sensitization of the public to the need to protect public spaces. Public institutions managing the environment should also encourage community involvement through sensitization to help protect public space as well as perform due diligence before buying land. The institutional framework around the maintenance of public space should also be clear so that this important public asset is more likely to contribute in a positive way to urban development

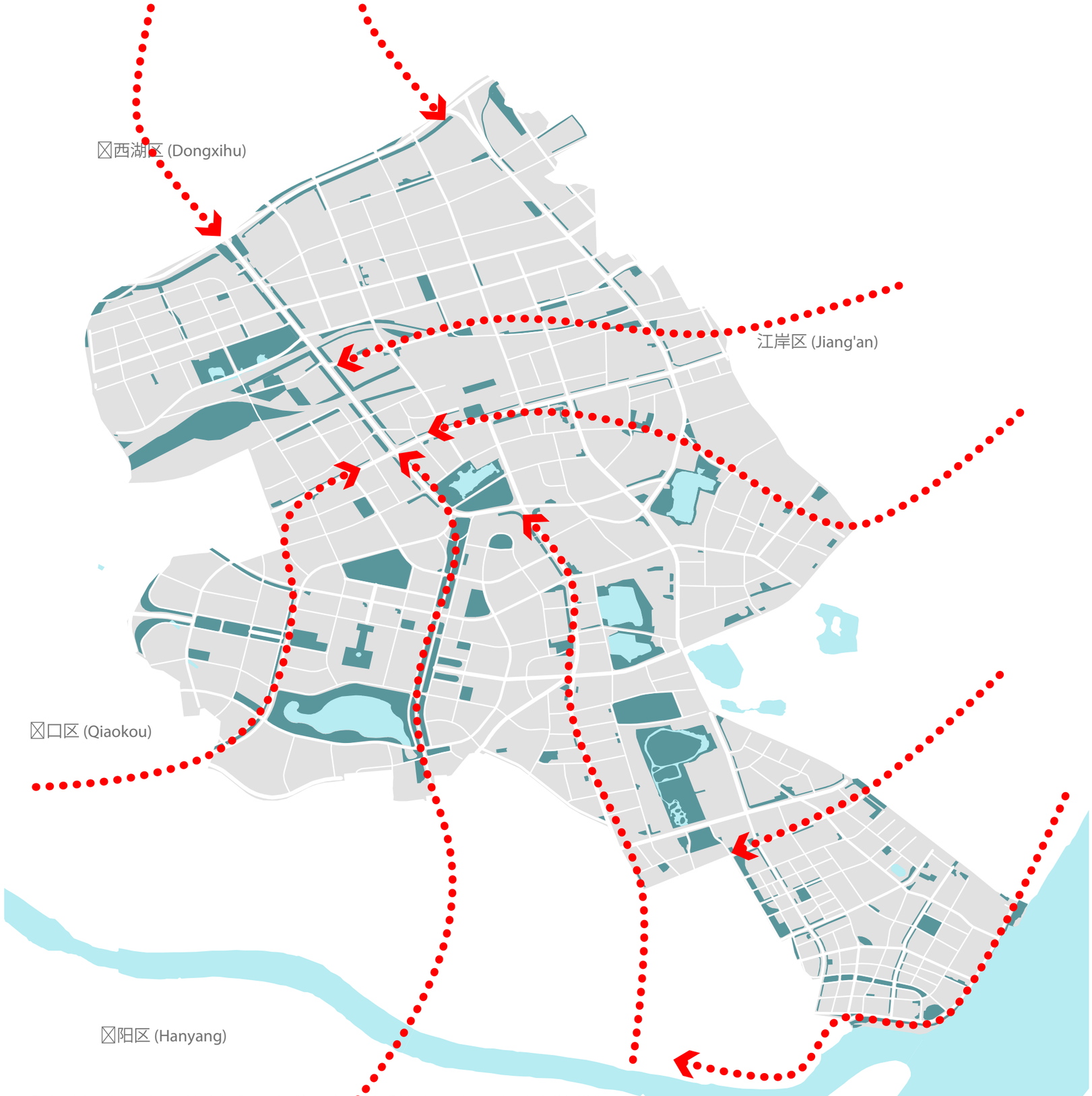
NETWORK

Many cities have realized the importance of well-designed and maintained public spaces in order to improve living conditions. However, public spaces need to be connected in a network which guarantees availability and accessibility. A holistic view of the city and its public space network is fundamental to maximize the potential of the existing infrastructure. The urban tissue is generated by the public spaces network, which contributes to construct the distinctive urban image of the city.

The goal of the city-wide public space inventory and assessment is not only to identify gaps in the safety, accessibility and inclusivity of public spaces but also to identify areas that lack public spaces within the city, where there is over provision and where they are poorly located. Jianghan's public spaces are diminishing and the ones that exist now are fragmented. The district should therefore, aim at reclaiming their public spaces and creating a network that links them. The urban network can be understood in two dimensions: physical form and functionality.

To ensure that residents of Jianghan experience their public spaces, these links between different spaces with different functions should be well connected, this in turn, creates social cohesion and sustainability. The district can capitalize on well connected streets (strings) to link to the open public spaces (nodes) and ensure every resident is within 10mins walk to a public space. Biodiversity conservation can be used as a method to create connectivity of public spaces and opens up new green corridors and the geometry formed by such connectivity leads to optimization of space.

Jianghan should also conduct a detail study of their street to measure their walk-ability and bike-ability, this will support walking as a means of transport and therefore reduce carbon emission by motorized transport.



DIVERSITY

Gehl identified the importance of creating places to walk, places to stand, and opportunities to sit. He also emphasized on creating places that facilitates enjoyment.

Public spaces are a key element of individual and social well-being, the places of a community's collective life, expressions of the diversity of their common, natural and cultural richness and a foundation of their identity. The community recognizes itself in its public places and pursues the improvement of their spatial quality.

When people do not see their values and preferences reflected in a place, they feel unwelcome. fostering safe spaces where particular communities can come together and celebrate their unique culture is important in achieving diversity.

Diversity in public space is a prerequisite of comfort and enjoyment in those spaces. The survey revealed that public spaces that were perceived as the most inclusive were only 49 accounting for 35% of all public spaces in the district. Jianghan should develop public spaces that are vibrant, and welcoming to all. Public space can make urban areas more attractive and create employment, such as through public markets; they can be a tool for inclusions, for example well-lit streets can contribute to women's sense of safety and freedom to move around the city and they can be a space for organizing communities, as well as cultural expression and diversity.

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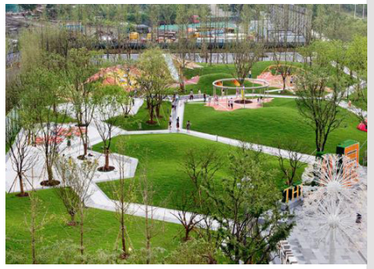
OBJECTIVES AND STRATEGIES

CITY PARKS

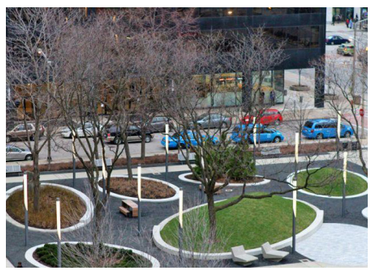


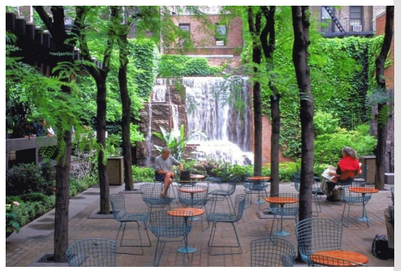



LINEAR SPACES



POCKET PARKS



Cities need to prioritize public space strategies and plans, in order to guarantee accessibility for all. Local government, in partnership with the different stakeholders, need to increase public space awareness and coordinate within their different departments. In many cases, there is no clear understanding of the role of different departments nor coordination between them. For instance, pavements are the responsibility of the Road Department, safety of the Emergency Services Department, trees of the Environment Department, cleaning and safety of the Health Department, licensing of the Local Business Department etc. In such cases, clear coordination mechanisms need to be developed to improve communication between the different departments. It is comforting to note that some local governments have created unified public space agencies.

Jianghan District should work towards creating a detailed action plan with public space projects as part of their workplan and working with key stakeholders involved in public space works to ensure implementation and the realisation of their vision and goals.

It is therefore in this report that public space design guidelines are presented for different public space typologies according to the objectives of the public space strategy. To ensure that Jianghan provides a high quality, safe and sustainable public space network for all residents and visitors to the city The recommendations provided in this report are strategic advice for specific places and cannot be considered as actual projects. They are to be further developed and designed by Jianghan district. They act as guidelines and models for the design of different public space typologies.

GAPS IN PUBLIC SPACE PROVISION

The potential of public space to fulfil its role of promoter of equity can be best fulfilled by correcting imbalances in the supply, quality and distribution of public spaces in different sections, neighbourhoods and settlements of the city. This is why public space surveys have to cover the whole urban area.

The city-wide public space inventory and assessment hopes to grasp trends in thinking about public space at city level, and to think of ways forward in developing comprehensive strategies for public spaces. While surveys and maps can offer a general picture of the position and type of public spaces in a city, indicators are numeric expressions that can offer useful information on the availability and quality of public spaces and help identify performance targets for the future.

Public spaces in Jianghan were found to be fragmented and of low quality and characteristic. The north ans south areas were found to lack city level public spaces. When a 1,000m buffer (10 minutes walk) is used along the street to a public space, the periphery shows a gap in the provision of public spaces. The quality analysis that is (Accessibility, Use, Comfort, Facilities, Green coverage) were also conducted and Jianghan's public spaces were found to be of low quality especialy in the accessibility and use.

AREA UNSERVICED
WITHIN 1000M BUFFER
(10mins walk)

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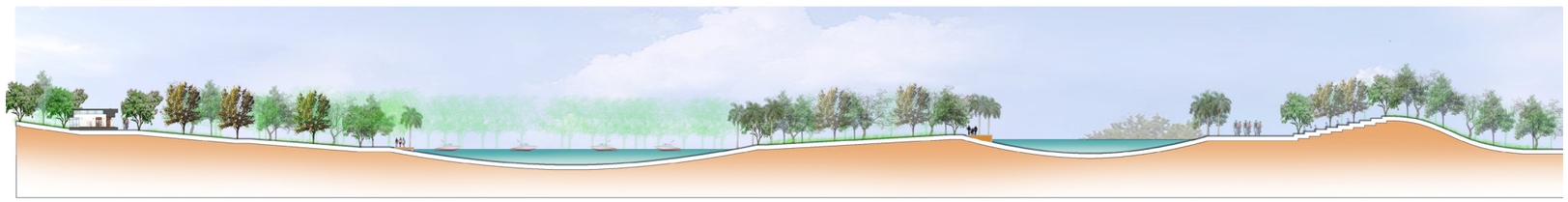
To take advantage of lake park as the catalysis to activate the district and improve the quality.

Having sufficient and adequate public spaces is a precondition for cities to function efficiently and equitably. Cities are well known for their public spaces and access to these spaces are a first step towards civic empowerment. City level public spaces are mostly located far from where the majority of the daily users live. As such, using and experiencing them requires a deliberate effort. They are usually accessed using some mode of transport. Therefore, if these spaces are attractive, welcoming and include a variety of use for everyone, they become destinations.

Majority of the parks in Jianghan district are located in the central business district. Areas such as the southern part of the district has no city park while the northern residential area has only two parks according to the results of the city-wide public space inventory and assessment. The city parks that exists, if designed and linked well to the district level public spaces, the pocket parks and the linear parks, they can activate the district by creating a network of public spaces that can enhance th experience of the district's residents.

City Park C

- A Art gallery
- B Floating gazebos
- C Viewing decks
- D Childrens play area
- E Seating areas
- F Landscape amphitheatre
- G Landscape nodes
- H Boating dock
- I Picnic area
- J Landscape curio shops
- K Washrooms
- L Fishing deck



DESIGN GUIDELINES FOR PARKS

Given the limited availability to acquire new parkland within the high density areas of the district, alternative solutions are required into the future. City level parks can be a variety of sizes and have a variety of purpose depending upon context and district setting. Regardless of this the intent is that such facilities are to be memorable places within the community whether it be for outstanding sporting and recreation facilities or for architecture, art, historical reference or cultural significance. Facility requirements and design standards will be determined on a site specific basis at the time of park concept plan preparation. However, there are general design guidelines that could be used;

- Create multiple access/egress points along the park perimeter.
- Signage is to be located at the front of the park to ensure improved visibility.
- Provide a hard surfaced pathway that traverses the park and links into embellishments such as shelters, seats, bbqs, playgrounds etc.
- Maintain clear sight lines across passive and active use areas.
- Maintain clear sight lines to potential hazards such as water bodies, open drains, car parks and roads.
- Use low shrubs and groundcover planting that do not interrupt sight lines or create possible ‘hiding’ spots.
- Utilise existing trees or plant new trees to create shade to passive and active activity areas.
- Design parks in accordance with CPTED principles.
- Plan and design parks so that cost effective maintenance programs can be established.
- Plan and design parks so that it does not adversely impact natural, cultural or heritage features and values.
- Create spaces that are multi-functional and flexible and facilitate and provide opportunities for social interaction.
- Incorporate Water Sensitive Urban Design (WSUD) into the design of parks.
- Use materials and designs that are local and particular to the place wherever practical.
- Universal accessibility

To excavate and recycle the pocket space as the green node to increasing the accessibility.

One of the unique and exciting characteristics of pocket parks is that they may be created out of vacant lots or otherwise forgotten spaces. Many pocket parks are the result of community groups, private entities or foundations reclaiming these spaces for the benefit of the local neighborhood. Unfortunately, they are sometimes easier to create than to maintain because without functional design, community support, use and maintenance, they may fall into disrepair.

Ideally, pocket parks are closely tied into the neighborhoods they serve. By nature, they tend to be scattered and disconnected because they are usually created opportunistically. With some planning, they can be connected if they are placed along greenways or bike paths as long as they would still be visible to a sufficient number of pedestrians who are also potential users. These parks if designed along transport corridors can act as node and will hence be connected to neighborhood level public spaces and city level public spaces, making them part of a network.

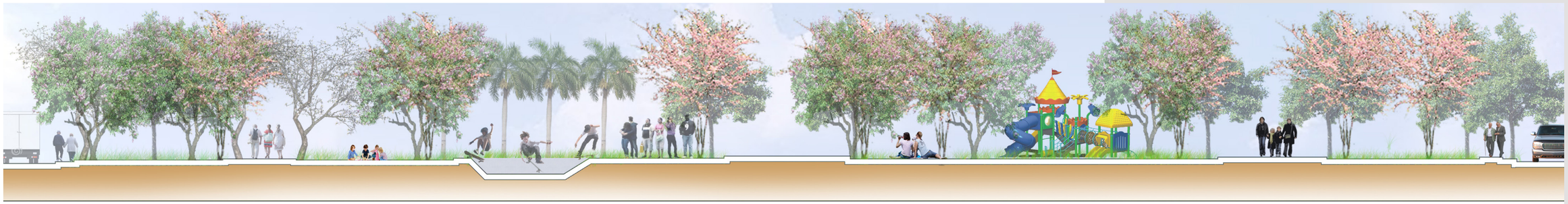
Pocket Parl

1. Art gallery
2. Skating ramp
3. Seatinga areas
4. Landscape plaza
5. Water feature
6. Children play area
7. Landscape nodes

DESIGN GUIDELINES FOR POCKET PARKS

Pocket parks are usually centrally located within the residential/mixed-use development and/or easily accessed by residents or workers, without the use of vehicles, generally within 5 -10 minutes. Consideration given in residential areas to use by and interests of the young children and the elderly. In business or commercial areas, corners or vacant lots may be desirable; unique situations involving road or railroad abandonments or rights-of-way reductions may present other opportunities. Minimum requirements for pocket park design include;

- Planting to promote shade over at least 25% of area
- Support amenities such as benches (in shade and sun), bike racks, trash receptacles
- Gazebos or similar shade structures which may substitute some planting
- Small playground
- Decorative architectural features, statues or water fountains (if in a residential area, should be maintained by residents)
- Picnic tables including moveable tables and chairs in secure sites with identified maintenance responsibilities and programming.
- Minimal signage and security lighting
- Opportunities for art
- Integration with adjacent public rights-of-way.
- Universal accessibility



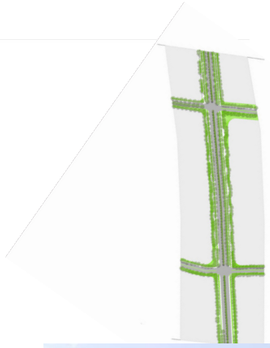
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

To enhance the linear green space to connect places and built the spatial structure.

Linear parks include greenways, waterfronts, and transportation infrastructure, frequently in re-used sites linking major urban nodes. Activities often associated with road and railway reserves include vending, walking, jogging, resting, and playing among others. Riparian reserves on the other hand are associated with enjoying a walk, and urban agriculture amongst others. Linear parks have cultural, ecological, developmental, agricultural and recreational values.They, unlike other types of public spaces, are used for moderate and vigorous physical activities.

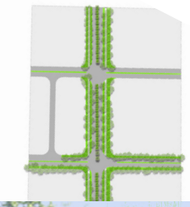
In cities or districts such as Jianghan where there is not much land to spare, linear parks are key in creating more access to public spaces. They are drivers for the regeneration of deprived areas in the district. The success of linear parks depends upon the design and location of these spaces. The design will affect how the space will be used and managed. Jianghan should capitalize on the connectivity of its street network to create linear public spaces that links to other open public spaces which will promote biodiversity and enhance the district's environmental sustainability.

Linear Park



New Town

Commercial Town



Old Town

DESIGN GUIDELINES FOR LINEAR SPACES

When designing a new transportation infrastructure for example, both functional and visual demands of the infrastructure need to be considered. Road reserves and medians need to be designed as public spaces. It is important to establish an interconnected network of urban streets that avoids cul-de-sacs and dead ends and provides a range of access choices for pedestrians and vehicles. Some guidelines for linear parks may include;

- The design should include street furniture including lights, benches, bike racks, trash bins, planters
- Specialty in the sidewalk paving
- Designated space for sidewalks cafes or outdoor seating
- Specialty in the paving to distinguish the park from surrounding public streets
- The private street should act as part of the overall urban street network
- On-street parking especially for bicycles
- Wide sidewalks (minimum 4metres)
- Retail/commercial activities on ground floors to activate street

REFERENCES

al, P. G. (2015). Global Public Space Toolkit: From Global Principles to Local Policies and Practice. Nairobi.

al, P. W. (2016). Global Public Space Programme: ANNUAL REPORT 2016. Nairobi.

Appleyard, D. (1981). Livable Streets. Los Angeles: University of Carlifornia Press.

Coast, C. o. (2016). Park Design Guidelines: Safe, responsive and sustainable parks for our city. City of Gold Coast.

Ghel, J. (2013). Moscow: Towards a Great City fpr People. Moscow.

Ghel, J. (2014). Istanbul: An Accessible City-A city for People. Istanbul.

LaSalle, J. L. (2015). Wuhan - An Emerging World City.

Matthew Carmona, T. H. (2003). Public Space-Urban Spaces: The dimension of urban design. London: Architecture press.

Organization, W. H. (2014). Global Status of Non-Communicable Diseases. Geneva.

Organization, W. H. (2016). Urban green Spaces and Health. Copenhagen.

Pinto Ana Júlia, R. A. (2010). Planning public spaces networks towards urban cohesion . 46th ISOCARP Congress 2010.

Sarah Bennet, J. B. (2000). Locality, Regeneration and Diverse Cities; Advances in Art and Urban Futures. England.

Notes

Notes

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